



University of Colorado **Boulder**

2017–18

University Catalog

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Germanic & Slavic Languages & Literatures (GSLL)	1684	MS Business Core (MSBC)	1846
Global Studies Residential Academic Program (GSAP)	1685	MS Business Electives (MSBX)	1847

Museum (MUSM)	1848
Music (MUSC)	1851
Music Electives (MUEL)	1868
Music Ensemble (EMUS)	1870
Naval Science - ROTC (NAVR)	1874
Neuroscience (NRSC)	1874
Norlin Scholars (NRLN)	1878
Norwegian (NORW)	1878
Operations and Information Management (OPIM)	1878
Operations Management (OPMG)	1879
Organization Management (ORMG)	1879
Peace & Conflict Studies (PACS)	1880
Performance Music (PMUS)	1880
Philosophy (PHIL)	1882
Physics (PHYS)	1890
Political Science (PSCI)	1897
Portuguese (PORT)	1909
Presidents Leadership Class (PRLC)	1911
Psychology (PSYC)	1911
Real Estate (REAL)	1920
Religious Studies (RLST)	1920
Russian (RUSS)	1926
Sanskrit (SNSK)	1932
Scandinavian (SCAN)	1932
Sewall Residential Acad Prgm (SEWL)	1934
Sociology (SOCY)	1934
Spanish (SPAN)	1943
Speech, Language, & Hearing Sciences (SLHS)	1950
Sustainability and Social Innovation RAP (SSIR)	1957
Swedish (SWED)	1957
Telecommunications (TLEN)	1958
Theatre (THTR)	1961
Thesis Music (TMUS)	1969
Tibetan (TBTN)	1972
Women & Gender Studies (WGST)	1973
Writing and Rhetoric (WRTG)	1980
Yiddish (YIDD)	1981
Index	1982

ABOUT CU BOULDER

General Information

As a comprehensive university, CU Boulder is committed to the liberal education of students via a broad curriculum ranging from the baccalaureate through the postdoctoral levels. The chancellor is the chief academic and administrative officer and is responsible for conducting campus affairs in accordance with the policies of the regents.

Students

With an enrollment of more than 32,000 students, the CU Boulder is the largest of the four-campus University of Colorado system. The student population comes from every state in the nation and from more than 130 foreign countries. Many different ethnic, religious, academic and social backgrounds are represented, fostering the development of a multicultural academic community that enriches each student's educational experience.

Faculty

CU Boulder has more than 1,204 tenured and tenure-track faculty, with 100 percent holding doctorates or appropriate terminal degrees. The faculty includes nationally and internationally recognized scholars with many academic honors and awards, including:

- David Wineland won the 2012 Nobel Prize in physics;
- Several CU Boulder research faculty from the National Snow and Ice Data Center shared the 2007 Nobel Peace Prize with former Vice President Al Gore for their contributions to the international report of the Intergovernmental Panel on Climate Change;
- John Hall won the 2005 Nobel Prize in physics;
- Carl Wieman and Eric Cornell won the 2001 Nobel Prize in physics;
- Tom Cech won the 1989 Nobel Prize in chemistry;
- Eight faculty have received MacArthur Fellowships, the so-called "Genius Grant."
- Twenty-three active or retired faculty are members of the National Academy of Sciences, all of whom are included in the membership of the American Academy of Arts and Sciences;
- Fifteen faculty are members of the National Academy of Engineering;
- Six faculty are members of the National Academy of Education.

Most faculty members, including full professors, teach both undergraduate and graduate classes. Faculty members incorporate their research and creative activities directly into instructional programs. Faculty participate in campus governance through the Faculty Senate and the Faculty Assembly. Students participate through the University of Colorado Student Government (CUSG) and the United Government of Graduate Students (UGGS).

Academic Offerings

The Boulder campus offers approximately 4,000 different courses in more than 110 distinct fields of study and 235 degree programs across the baccalaureate, master's, doctoral and professional levels. These courses represent a full range of disciplines in the humanities, the social sciences, the physical and biological sciences, the fine and performing arts, and the professions.

Research

CU Boulder is home to nearly 2,000 nationally and internationally recognized research faculty who have earned a global reputation for

outstanding teaching, research and creative work across more than 150 academic disciplines. While the classroom is the location for most instructional activities, laboratories, seminars and field work also are important features of the undergraduate and graduate experience. Students can get involved in research and creative work as early as their freshman year.

CU Boulder's sponsored research portfolio continues to grow. Since fiscal year 2006, CU Boulder has experienced 70 percent growth in research awards. Federal agency funding remains the mainstay of CU research, with 75 percent of awards coming directly from federal agencies. Five federal agencies are consistently the largest funding sources for CU Boulder awards:

- NASA,
- National Science Foundation,
- Department of Commerce,
- National Institutes of Health and
- Department of Defense.

CU Boulder remains the number one public university recipient of NASA research awards, and continues to be a national leader in aerospace and space research. Additionally, university researchers are expanding their impact through collaborative projects with industry, other universities, nonprofits and international partners.

CU Boulder's research institutes and research centers significantly contribute to the university's research and education missions, as well as the regional economy. Research faculty in academic departments, institutes and centers are continually expanding CU Boulder's research capabilities and collaborations, resulting in new knowledge, technologies and creative work for the benefit of Colorado, the nation and the world.

For more information, see the Research (p. 23) section.

Statutory Mission

CU Boulder's vision is grounded in its statutory mission as a national public research university. In Colorado statute, the university is defined as the "comprehensive graduate research university with selective admissions standards . . . offer(ing) a comprehensive array of undergraduate, master and doctoral degree programs" of what is now designated the University of Colorado System.

CU Boulder recognizes the exceptional opportunities associated with its role as a research university, and values the unique strength and character research achievements bring to undergraduate education. It is keenly aware of its responsibility for educating the next generation of citizens and leaders, and for fostering the spirit of discovery through research. Indeed, CU Boulder believes that its students, both graduate and undergraduate, benefit from the comprehensive mix of programs and research excellence that characterize a flagship university. Thus, CU Boulder's statutory mission is relevant today and will remain relevant tomorrow.

Since 2007, CU Boulder's strategic plan, *Flagship 2030*, has been guiding near-term actions and investments that will sustain CU's quality and competitiveness and, through visionary "flagship initiatives," will transform the university within the next quarter-century.

University of Colorado History

At its first session in 1861, Colorado's territorial legislature passed an act providing for a university in Boulder. Between 1861 and 1876, Boulder

citizens donated land south of town and made gifts from \$15 to \$1,000 to match the \$15,000 the state legislature appropriated for the university's construction. In 1875, Colorado citizens laid the cornerstone for the university's first building, Old Main, and officially founded CU in 1876, the same year Colorado joined the union. The university opened its doors the following year with 44 students, a president, and one instructor.

Today, the University of Colorado is a four-campus system that includes the University of Colorado Boulder, the University of Colorado Colorado Springs, the University of Colorado Denver and the University of Colorado Anschutz Medical Campus. The campuses have a combined enrollment of more than 63,000 students. To meet the needs of its students, the university system offers an extensive number of undergraduate, graduate and professional degree programs, as well as opportunities to study abroad, engage in public service and conduct research.

CU Boulder has a strong sponsored research portfolio, and the university also relies on revenues from tuition and fees, contracts and grants, investments and interest income, health services and the generous support of private foundations and donors.

An elected nine-member Board of Regents governs CU and is charged by the state constitution with the general supervision of the university and the exclusive control and direction of all its funds and appropriations, unless otherwise provided by law. The board conducts its business at regular meetings open to the public and through committees. The president is the chief administrative officer and is responsible for providing leadership to the university.

For more information about the CU Board of Regents, go to www.cu.edu/regents (<http://www.cu.edu/regents>); to learn more about the CU system, visit www.cu.edu (<http://www.cu.edu>).

Undergraduate Enrollment and Graduation Rates

CU Boulder's fall 2016 entering freshman class numbered 6,439. Of these, 45 percent were females, 52 percent residents of Colorado and 26 percent members of minority groups (African Americans, Asian Americans, Hispanics/Latinos, Native Americans and Pacific Islanders). Sixty-eight percent enrolled in the College of Arts and Sciences, 9 percent in the Leeds School of Business, 16 percent in the College of Engineering and Applied Science and 6 percent, combined, enrolled in the College of Media, Communication and Information, the Program in Environmental Design and the College of Music.

Of the freshmen entering in summer or fall 2010 who enrolled full time, 47 percent graduated within four years; 66 percent graduated within five years; and 70 percent graduated within six years. Of the students who entered in fall 2015, 87 percent returned for their second fall semester.

CU Boulder Accreditation and Affiliation

CU Boulder is accredited by the Higher Learning Commission (hlcommission.org; 800-621-7440 or 312-263-0456). See individual colleges and schools for program specific accreditation information.

For information on the content of academic programs and official degree designations, refer to the appropriate catalog sections.

As one of 34 U.S. public research institutions belonging to the prestigious Association of American Universities (AAU) - and the only member in the Rocky Mountain region - a goal at CU Boulder is to directly affect Colorado communities through collaborative research, innovation and

entrepreneurship. CU Boulder faculty, staff and students work with the broader community to establish unique connections that have lasting outcomes—both across Colorado and around the world.

About the Catalog

The *2017–2018 University Catalog* is an academic publication containing information about academic programs, policies and services; descriptions of colleges, schools and individual departments; and degree requirements, course descriptions and faculty listings as of Spring 2017.

The catalog is only published online in an accessible format. In accordance with requirements under the Americans with Disability Act (ADA), alternate formats are available upon request.

Because the catalog is compiled in advance of the published academic year, changes in programs and policies may occur. All catalog information is subject to change without notice or obligation, and the University of Colorado Boulder reserves the right to change any rules or curriculum requirements at any time. Current information may be obtained by consulting departmental advisors and reviewing registration materials distributed each semester.

The catalog is produced by the Office of the Registrar (<http://www.colorado.edu/registrar>) at the University of Colorado Boulder (<http://www.colorado.edu>). Previous academic catalogs can be found in the catalog archive (<http://www.colorado.edu/registrar/about/archive>). Questions concerning the catalog may be directed to catalog@colorado.edu.

Academic Calendar & Exams

The campus operates year round, with fall and spring semesters of 16 weeks each, a winter session in between fall and spring semesters, and a summer term that includes two three-week sessions (Maymester and Augmester), two five-week sessions, an eight-week session, a 10-week session and two intensive (one- or more-week) sessions.

For a complete calendar of academic and financial dates and deadlines, visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage. (<http://colorado.edu/registrar>)

The University of Colorado at Boulder has a legal and moral obligation to accommodate all students who must be absent from classes or miss scheduled exams in order to observe religious holidays; and takes care to not inhibit or penalize these students for exercising their rights to religious observance. For further information, see the university policy on the Observance of Religious Holidays and Absences from Classes and/or Exams (<http://www.colorado.edu/policies/observance-religious-holidays-and-absences-classes-and-or-exams>).

Summer 2017

May 15 (Mon.)	Classes begin for session M (Maymester)
May 29 (Mon.)	Memorial Day holiday; campus closed
June 2 (Fri.)	Final exams for session M (Maymester)
June 5 (Mon.)	Classes begin for sessions A, C and D

July 4 (Tues.)	Independence Day holiday; campus closed
July 7 (Fri.)	Final exams for session A (first five-week session)
July 11 (Tues.)	Classes begin for session B (second five-week session)
July 28 (Fri.)	Final exams for session C (eight-week session)
Aug. 7 (Mon.)	Classes begin for session G (Augmester)
Aug. 11 (Fri.)	Final exams for sessions B and D (second five-week session, 10-week session)
Aug. 24 (Thurs.)	Final exams for session G (Augmester)
Aug. 24 (Thurs.)	Degree conferral date (no campuswide ceremony)

Fall 2017

Aug. 28 (Mon.)	Classes begin
Sept. 4 (Mon.)	Labor Day holiday; campus closed
Oct. 1 (Sun.)	Freshman and transfer application deadline for spring semester
Oct. 1–4 (Sun.–Wed.)	Family Weekend
Nov. 15 (Weds.)	Freshman non-binding early action application deadline for fall semester and summer sessions
Nov. 20-22 (Mon.–Wed.)	Fall break; no classes
Nov. 23-24 (Thurs.–Fri.)	Thanksgiving holiday; campus closed
Dec. 14 (Thurs.)	Last day of classes
Dec. 15 (Fri.)	Reading day
Dec. 16-20 (Sat.–Wed.)	Final exams
Dec. 21 (Thurs.)	Degree conferral date (no campuswide ceremony)

Spring 2018

Jan. 14 (Sun.)	Freshman application deadline for summer and fall sessions
Jan. 15 (Mon.)	Martin Luther King Jr. holiday; campus closed
Jan. 16 (Tues.)	Classes begin
Mar. 1 (Thurs.)	Transfer application deadline for fall and summer sessions
Mar. 26-30 (Mon.–Fri.)	Spring break (campus closed Friday, March 30)
May 1 (Mon.)	Freshman confirmation deadline
May 3 (Thurs.)	Last day of classes
May 4 (Fri.)	Reading day
May 5-9 (Sat.–Wed.)	Final exams
May 10 (Thurs.)	University commencement ceremony; degree conferral date

Summer 2018

May 14 (Mon.)	Classes begin for session M (Maymester)
May 28 (Mon.)	Memorial Day holiday; campus closed
June 1 (Fri.)	Final exams for session M (Maymester)
June 4 (Mon.)	Classes begin for sessions A, C and D
July 4 (Wed.)	Independence Day ; campus closed
July 6 (Fri.)	Final exams for session A (first five-week session)
July 10 (Tues.)	Classes begin for session B (second five-week session)
July 27 (Fri.)	Final exams for session C (eight-week session)
Aug. 6 (Mon.)	Classes begin for session G (Augmester)
Aug. 10 (Fri.)	Final exams for sessions B and D (second five-week session, 10-week session)
Aug. 23 (Thurs.)	Final exams for session G (Augmester)
Aug. 23 (Thurs.)	Degree conferral date (no campuswide ceremony)

Final Examinations

It is the policy of the University of Colorado Boulder to adhere to the final examination schedule (<http://www.colorado.edu/registrar/students/academic-calendar/final-exam-schedule>) as published on the Office of the Registrar website each semester. While it may be appropriate not to give a final in some cases, such as laboratory courses, seminars and colloquia, final examinations are integral parts of the instructional program and should be given in all other undergraduate courses. Unless notified otherwise in writing during the first week of classes, students should assume that an examination will be given.

In addition to the principles stated above, the following guidelines should be followed by all faculty members and administrators in order to assure fairness and the best possible educational experience for students.

1. The final examination in a course must be given as scheduled and not at other times, even if the faculty member and all students in a course agree to such a change.
2. The week of classes preceding the scheduled final examination period should be used primarily for continued instruction and may include the introduction of new material. No hourly examinations are to be given during the seven days preceding the start of the final examination period. However, lab practicums and seminar presentations may be scheduled during this week.
3. Individual students may be granted a variance from these policies, provided the instructor is satisfied that the exception is based on good and sufficient reasons, and that such an exception for an early or late examination will not prejudice the interests of other students in the course.
4. When students have three or more final examinations on the same day, they are entitled to arrange an alternative examination time for the last exam(s) scheduled on that day. When students have two

final exams scheduled to meet at the same time, they are entitled to arrange an alternative examination time for the later course offered that day or week. Such arrangement must be made by the deadline to drop the course without dean and instructor permission in the tenth week of the semester. Students should make arrangements with the instructor of the affected course and are expected to provide evidence of these situations to qualify for exceptions.

5. This policy applies to all undergraduate students, including seniors. Graduating seniors are not exempted from final examinations. Such exemptions are inappropriate on both procedural and academic grounds.
6. The submission deadline of all grades for each semester is 90 hours after the conclusion of the final exam, minus Sundays and official designated university holidays.

Academic Integrity

A university's intellectual reputation depends on maintaining the highest standards of intellectual honesty. Commitment to those standards is a responsibility of every student, faculty member and staff member on the University of Colorado Boulder campus.

Honor Code

A student-run Honor Code was instituted on the Boulder campus in 2002. The intent of the Honor Code is to establish a community of trust in which students do not plagiarize, cheat or obtain unauthorized academic materials. An Honor Code Council collaborates with the colleges and schools in addressing allegations and instances of academic dishonesty and in assisting to educate all members of the university community on academic integrity issues.

Breaches of academic honesty include but are not limited to cheating, plagiarism and the unauthorized possession of examinations, papers, and computer programs.

A student accused of academic dishonesty may either accept the accusation made by a faculty member or request a hearing before a student panel, which will make a decision on the accusation of academic dishonesty. In addition to academic sanctions imposed by the faculty, students found responsible for academic dishonesty also face consequences from the Honor Code Council including but not limited to Honor Code probation, education seminars concerning academic writing and ethics, suspension and expulsion from the university. For information, visit the Honor Code Office (<http://honorcode.colorado.edu>) website.

The following terms are defined here for the benefit of all members of the university community.

Cheating

Cheating is defined as using unauthorized materials or receiving unauthorized assistance during an examination or other academic exercise. Examples of cheating include: copying the work of another student during an examination or other academic exercise or permitting another student to copy one's work; taking an examination for another student or allowing another student to take one's examination; possessing unauthorized notes, study sheets, examinations or other materials during an examination or other academic exercise; collaborating with another student during an academic exercise without the instructor's consent; using unauthorized technologies, such as calculators, computers, and smart phones; and/or falsifying examination results.

Plagiarism

Plagiarism is defined as the use of another's ideas or words without appropriate acknowledgment. Examples of plagiarism include: failing to use quotation marks when directly quoting from a source; failing to document distinctive ideas from a source; fabricating or inventing sources; and copying information from computer-based sources, i.e., the Internet.

Unauthorized Possession or Disposition of Academic Materials

Unauthorized possession or disposition of academic materials may include: selling or purchasing examinations, papers, reports or other academic work; possessing unauthorized solutions, instruction manuals or texts; taking another student's academic work without permission; possessing examinations, papers, reports or other assignments not released by an instructor; and/or submitting the same paper for multiple classes without advance instructor authorization and approval.

Academic Records

Degree Audit

A degree audit report helps students track degree requirements and progress in order to help them complete graduate on time. The audit outlines courses needed for the degree and applies college-defined rules, provides hypothetical "what if" degree information and identifies transfer credits and course cutbacks for repeated courses. The audit also includes transfer courses that have been applied to degree requirements. Students and advisors can access the degree audit tool through MyCUInfo (<http://mycuinfo.colorado.edu>).

Diplomas

A diploma is issued for each unique degree earned at the University of Colorado. Doctoral candidates receive their diplomas at commencement. Diplomas are mailed to all other graduating students approximately eight weeks after the close of the semester in which degree requirements were completed and verified. All financial obligations with CU must be resolved before a diploma is issued.

In addition to the standard diploma, CU Boulder also offers alumni graduating in Fall 2015 and later a certified electronic diploma (CeDiploma) (<http://www.colorado.edu/registrar/students/graduation/cediploma>).

Graduating students with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. The hold prevents receipt of a diploma or an academic transcript of work at the university and registration for future terms. Students can complete a loan exit interview by contacting Heartland ECSI at 1-888-549-3274 or via the Heartland ECSI (<http://www.heartlandecsi.com>) website. Questions may be directed to University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844.

Certified electronic diplomas (CeDiplomas), display diplomas or replacement diplomas may be ordered online after graduation. For more information, visit the Office of the Registrar's Diplomas (<http://www.colorado.edu/registrar/alumni/diplomas>) webpage.

Enrollment & Degree Certification

Using MyCUInfo (<http://mycuinfo.colorado.edu>), students may print an official enrollment certification at no charge. Certification of full- or part-

time enrollment is only available after the census date (approximately the third week of classes) for the semester in question. This certification can be used whenever enrollment or degree verification is required for car insurance, loan deferments, medical coverage, scholarship purposes, etc. The Office of the Registrar can provide written confirmation of registration, enrollment or degree status upon request by current or former students.

CU Boulder has authorized the National Student Clearinghouse (NSC) to act as its agent for purposes of third party enrollment and degree verification. The NSC will be able to verify degrees and enrollment for only those students who have not placed a privacy restriction on their academic record. The student's name when enrolled, social security number or student ID, and date of birth will be required for identification purposes and enrollment or degree verification. All third parties should contact the National Student Clearinghouse by phone or visit their web site for current enrollment and degree verification information, instructions, and fees. Degrees also may be verified by ordering an official transcript, or official degree certification.

Transcripts

Official Transcripts

Students may order official transcripts through the MyCUInfo (<https://mycuinfo.colorado.edu>) portal. Official transcripts are available in paper or electronic PDF and may be ordered as either a complete academic record of courses taken at all University of Colorado campuses or as a select career (undergraduate, graduate, law or noncredit). Official transcripts bear the signature of the registrar and the official seal of the university (not applicable to noncredit transcripts).

Transcripts can be withheld for ongoing financial obligations to the university or for disciplinary actions.

Unofficial Transcripts

Currently enrolled students and alumni who have access to the MyCUInfo portal may access and print unofficial transcripts free of charge through MyCUInfo (<https://mycuinfo.colorado.edu>). Unofficial transcripts display the complete academic record of courses taken at the University of Colorado. However, academic institutions and potential employers generally do not accept the unofficial transcript as evidence of a student's career at CU Boulder, as this transcript does not carry the registrar's signature, the seal of the university or other security features. Unofficial transcripts are primarily used for advising and counseling in offices on campus and at other University of Colorado campuses.

Administration

Board of Regents

Irene C. Griego, Chair, District 7; term expires January 2021
Glen Gallegos, Vice Chair, District 3; term expires January 2019
John Carson, District 6, term expires January 2021
Heidi Ganahl, At Large; term expires January 2023
Kyle Hybl, District 5; term expires January 2019
John "Jack" Kroll, District 1; term expires January 2023
Stephen Ludwig, At Large; term expires January 2019
Sue Sharkey, District 4, term expires January 2023
Linda Shoemaker, District 2; term expires January 2021

Administrative Officers CU System

Bruce Benson, President. BS, University of Colorado Boulder.
Leonard Dinegar, Senior vice president and chief of staff. BA, Catholic University of America; MA, University of Colorado Denver.
Michael Lightner, Vice president and academic affairs officer (interim). BS, MS, University of Florida; PhD, Carnegie-Mellon University.
Johnnie Ray, Vice president for advancement. BA, Texas Tech University.
Tanya Kelly-Bowry, Vice president for government relations. BA, University of Colorado Boulder; MA, Regis University.
Ken McConnellogue, Vice president for communication. BS, University of Colorado Boulder; MA, University of Northern Colorado.
Patrick O'Rourke, Vice president, university counsel, and secretary of the Board of Regents. BA, Creighton University; JD, Georgetown University Law Center.
Kathy Nesbitt, Vice president, employee and information services. BA, University of Colorado; JD, Southern University Law Center.
Todd Saliman, Vice president and chief financial officer. BA, University of Colorado Boulder.

CU Boulder

Philip P. DiStefano, Chancellor; professor of education. BS, PhD, Ohio State University; MA, West Virginia University.
Russell L. Moore, Provost and executive vice chancellor for academic affairs. BS, University of California, Davis; PhD, Washington State University.
Kelly Fox, Senior vice chancellor and chief financial officer. BA, University of Nebraska; MA, University of Colorado Denver.
Robert Boswell, Vice chancellor for diversity, equity, and community engagement. BA, Marietta College; PhD, University of Colorado Boulder.
Deborah J. Coffin, Vice chancellor for development. BS, BA, MA, University of Northern Colorado.
Frances Draper, Vice chancellor for communications and strategic relations. BA, Stanford University; MBA, University of California, Berkeley.
Terri Fiez, Vice chancellor for research and innovation. BS, MS, University of Idaho; PhD, Oregon State University.
Christina Gonzales, Vice chancellor for student affairs. BS, MA, New Mexico State University.
David Kang, Vice chancellor for infrastructure and safety. BS, University of California, San Diego; MS, University of California, Berkeley.
Catherine Shea, Chief of staff and director of ethics and compliance. BA, University of Notre Dame; JD, Catholic University Columbus School of Law.
Valerie Simons, Executive director and Title IX coordinator, Office of Institutional Equity and Compliance. BA, University of California, Berkeley; JD, Georgetown University.
Elvira Strehle-Henson, Managing Associate University Counsel. BA, JD, University of Colorado Boulder.
Rick George, Athletic director. BA, University of Illinois.

Campus Map

The Campus Setting

CU Boulder is located at the foot of the Rocky Mountains, at an altitude of 5,400 feet. The Flatirons geologic formation is visible from nearly everywhere on campus. The climate is temperate, with generally pleasant days and cool evenings. On average, Boulder enjoys about 300 sunny days each year. The main campus covers 600 acres and includes about

200 buildings constructed of rough-cut Colorado sandstone with red tile roofs. The rural Italian (or Tuscan vernacular) architectural style evolved from a master plan developed by Philadelphia architect Charles Klauder in 1919. The Norlin Quadrangle, including the original Old Main building, is listed in the State and *National Register of Historic Places*. The campus has been noted as one of the most aesthetically pleasing in the country.

Boulder County encompasses five ecological zones, from 5,000 feet above sea level (plains grassland) to 14,000 feet (alpine tundra). Downtown Boulder is only 20 miles from the Continental Divide and boasts some of the most spectacular scenery in the United States. The city of Boulder, population 103,000, is committed to preserving its beautiful natural environment and is surrounded by 45,000 acres of open space.

Denver, the state's capital city, is 30 miles from Boulder. Denver offers the attractions and resources of a large metropolitan area and is accessible from Boulder by traveling on U.S. 36, also known as the Denver–Boulder Turnpike. Denver's international airport is served by most major carriers and is located approximately 60 minutes southeast of Boulder. Boulder and the Denver International Airport are connected by a public transportation system.

Continuing Education

The mission of the Division of Continuing Education is to provide quality, innovative, lifelong learning opportunities to a diverse student population by extending the educational resources of the University of Colorado Boulder. A variety of credit courses, seminars, noncredit, certificate, and degree programs are offered through Continuing Education, which also administers CU Boulder's Summer Session. Only university-approved faculty teach in Continuing Education programs.

ACCESS and High School Concurrent Programs

In conjunction with CU Boulder academic departments, ACCESS (<http://ce.colorado.edu/programs/access>) (Available Credit Courses for Eligible Special Students) enables nondegree students to enroll in Boulder main campus undergraduate and graduate credit courses after degree-seeking students have registered. Colorado high school juniors and seniors interested in the challenge of university course work may enroll in ACCESS as part of the High School Concurrent Program (<http://ce.colorado.edu/programs/high-school-concurrent>). In addition to earning college credit, students may also earn credit toward high school graduation requirements.

Applied Music Program

The Applied Music Program (<http://ce.colorado.edu/programs/applied-music>) offers non-music majors the opportunity to earn CU credit for beginning or continuing music lessons on guitar, piano, voice, winds, brass, drums, percussion or strings. Instruction is available in individual or group sessions depending on the instrument.

CU Complete

The goal of CU Complete (<http://ce.colorado.edu/programs/cu-complete>) is to assist former CU Boulder students in the completion of their degrees. Advisors work with each student individually and offer a degree analysis, recommendations, resources and assistance in completing remaining requirements.

Evening Credit Program

Offered in conjunction with CU Boulder's academic departments, the Evening Credit Program (<http://ce.colorado.edu/programs/evening-credit>) provides credit courses in the evening on the Boulder campus. These affordable, smaller-sized classes are provided through various departments.

Extraordinary Program

The Extraordinary Program offers alternative solutions to meet unique needs of academic programs and departments across campus in terms of special student populations, customized schedules, and specific financial arrangements. There are over 200 courses offered annually, ranging from one-day workshops to courses that span multiple semesters. The program benefits the goals of 30 different departments and serves a wide variety of students, including first generation college-bound high school students; art post-bacc students; speech, language and hearing sciences professionals; K-12 teachers from local schools districts, across the nation and the world; degree-seeking students from CU Boulder and other institutions; and more. The program also enrolls students in graduate degree and certificate programs from nearly all schools and colleges.

Individualized Instruction

Individualized Instruction provides an opportunity for students to receive credit for university courses by meeting with faculty members outside the regular classroom setting. This option may be used when the student cannot reasonably be expected to enroll in the main campus course.

International English Center

The International English Center (<http://iec.colorado.edu>) (IEC) offers a range of comprehensive English language and culture programs designed for international children, teens, pre-collegiate, undergraduate and graduate students, working professionals, au pairs, and special groups. Students build and refine their communication skills through engaging classroom instruction, experiential learning, extended practice, and cultural activities. Full and part-time programs are available. Students can choose from classroom, hybrid and online formats. Programs include intensive English, ESL academic bridge (for conditionally admitted CU Boulder students), ESL credit for undergraduate and graduate students, EducationUSA Academy for international high school students, test preparation, language and culture for au pairs, global professional English, military English and leadership communication, teacher training, and customized options for special groups. The IEC is authorized to issue a form I-20 for qualified students seeking to study full-time on an F-1 visa. For some programs, qualified exchange visitors may request a form DS-2019 from the IEC to apply for a J-1 visa.

Master of Science in Organizational Leadership

The Master of Science in Organizational Leadership (<http://ce.colorado.edu/program-landing/master-science-organizational-leadership>) is an interdisciplinary, fully online professional master's degree that prepares early- to mid-career professionals to succeed as tomorrow's dynamic leaders. Through coursework that blends business, communications, and social sciences, the program develops the knowledge and skills students need to think critically about organizational challenges and how to address them using best practices. Students learn to align others around a shared vision, build and manage

effective teams, and apply the leadership skills necessary to excel in an increasingly fast-paced and complex work world.

Online Credit Program

The Online Credit Program (<http://ce.colorado.edu/programs/online-credit>) offers online versions of approved CU Boulder courses from over 25 departments on campus. Online courses hold the same breadth, depth and rigor as face-to-face courses while offering students more control over when and where they complete their coursework. A rich collaboration among faculty and instructional designers with expertise in learning technology focuses on ongoing enhancements of quality and innovation. Courses range from traditional semester-long courses to shorter intensive terms and self-paced courses.

Post-Baccalaureate Health Professions Program

The Post-Baccalaureate Health Professions Program (<http://ce.colorado.edu/programs/post-baccalaureate-health-professions>) is a partnership between the College of Arts and Sciences and the Division of Continuing Education. It is designed for career changers who were academically successful as undergraduates but have not completed the prerequisite science courses needed to apply to graduate medical programs. Students enter the program in a cohort and take all course work together. Academic advising, tutoring and preparation for applying to medical schools are provided.

Science Discovery

Science Discovery (<http://sciencediscovery.colorado.edu>) is a science education outreach organization designed to heighten student interest and increase literacy in science, technology, engineering, art and math (STEAM). Science Discovery connects K–12 students and teachers to current CU science through a broad array of programs including summer camps, after-school classes, in-school programs, teacher professional development workshops and Teen Science Cafés. Programs capitalize on CU Boulder's scientific resources, facilities and expertise (including CU graduate and undergraduate students) in order to excite students about STEAM, expose them to a variety of STEAM careers and professionals and inspire a future generation of scientists and engineers. Science Discovery reaches more than 25,000 students and teachers throughout Colorado.

Winter Session

Winter Session (<http://www.colorado.edu/winter>) allows students to immerse themselves in captivating subjects in unique destinations. Winter Session courses provide students with exciting off-campus learning experiences where they can gain field or lab experience for credit while working alongside CU Boulder's leading faculty experts.

Youth Piano Lessons Featuring CU Instructors

The CU Youth Piano Program (<http://ce.colorado.edu/programs/youth-piano>) trains students through weekly group and private lessons. Instructors are experienced teachers from the CU College of Music. The lessons provide thorough instruction at the highest and most effective pedagogical standards while providing opportunities for fun, motivation, and enjoyment of music.

Summer Session

Summer Session (<http://www.colorado.edu/summer>) offers over 600 campus courses and enrolls about 8,000 students in a relaxed, comfortable learning environment. Online and on-campus courses are available to students who wish to enhance or accelerate their academic progress. Courses are also open to students visiting from other colleges, teachers, high school students or others interested in pursuing their professional development or enrichment.

Special three-week summer sessions are offered throughout the summer season to provide intense, accelerated courses for those who need academic credits in an abbreviated time period.

Learn more about summer dates and deadlines and tuition at summer.colorado.edu (<http://www.colorado.edu/summer>).

Auditing

Auditing allows interested individuals the opportunity to attend university classes for no academic credit. Auditors must receive permission and obtain a signature from course instructors during the first week of class to be formally added to the roster.

Audited courses will appear on a special non-academic credit transcript; however, no academic credit is awarded. Registered auditors receive class instruction, D2L access and library privileges only. Being an auditor at the University of Colorado Boulder does not guarantee eligibility for regular degree or nondegree status.

Note: Admitted degree students, either enrolled or suspended, are not permitted to audit courses. If an admitted degree student is interested in participating in a class without receiving credit, the student must enroll in the course for no credit. Courses taken for no credit are assessed the same tuition rate as courses taken for credit.

Community Auditors

Community members age 18–54 can register for the Community Auditors program through Continuing Education by completing the Community Auditor Registration Form on the Community Auditors (<http://ce.colorado.edu/programs/community-auditors>) webpage. Contact ceregistration@colorado.edu or call 303-492-5148 for more information.

With instructor permissions, community auditors pay a set rate to audit as many classes as desired. Nonrefundable payment is due at the time of enrollment.

Senior Auditors Program

Individuals 55 years and older can register for the Senior Auditors Program through the CU Boulder Alumni Association and qualify for a reduced auditing rate. Registration and eligibility information is available on the Senior Auditors (<http://www.colorado.edu/alumni/programs/senior-auditors>) webpage. Contact the Alumni Association at 303-492-8484 for more information about this program.

Office for Outreach and Engagement

Public outreach and community engagement are crucial to the University of Colorado Boulder's role as a comprehensive public research university and are vital to the Division of Continuing Education's mission. The Office for Outreach and Engagement (<http://www.colorado.edu/outreach/oe>) serves the CU Boulder campus and the state by helping to connect research, teaching and creative work with public needs and interests. The

office administers the CU Boulder Outreach Awards for faculty-led outreach and engagement projects, manages the campus-wide Public Outreach and Community Engagement (<http://www.colorado.edu/outreach>) website, assists with program and proposal design, leads strategic outreach initiatives, organizes the CU on the Weekend lecture series and provides public relations support.

Credits & Grading

Grading System

The following grading system is standardized for all colleges and schools of the university. Each instructor is responsible for determining the requirements for a class, determining the grading scale used, and for assigning grades on the basis of those requirements and grading scale.

Standard Grade Points per Hour of Credit

A	superior/excellent, 4.0
A-	3.7
B+	3.3
B	good/better than average, 3.0
B-	2.7
C+	2.3
C	competent/average, 2.0
C-	1.7
D+	1.3
D	1.0
D-	minimum passing, 0.7
F	failing, 0.0

Grade Symbols

I	incomplete; changed to F if not completed within one year
IP	in progress; thesis at the graduate level or specified graduate-level courses
P	passing; under the pass/fail option, grades of D- and above convert to a P. Other specified courses may also be graded on a pass/fail basis.
NC	no credit
W	withdrew
***	class grades were not submitted when final grades were processed, or the student is currently enrolled in the course.

Explanation of an I (Incomplete) Grade

An I grade indicates that the student did not complete the requirements for the course by the end of the grading period for that semester. If the student does not complete the course requirements within one year, the I grade is converted to an F. When a final grade has been assigned, the transcript states, "Originally graded as Incomplete."

Requests for incomplete grades must be initiated by the student when, for reasons beyond his or her control, the student is unable to complete the course requirements. A substantial amount of work must have been satisfactorily completed before approval for such a grade is given.

If an instructor grants a request for an incomplete, the instructor sets the conditions under which the course work can be completed and the time limit for its completion or if the course should be retaken. If a course is retaken, it must be completed on the Boulder campus or in Boulder evening classes, and the student must re-register for the course and pay the appropriate tuition.

The initial grade of I is not removed from the transcript if the course is retaken.

Grade Point Average

The overall University of Colorado grade point average (GPA) is computed as follows: the credit hours and credit points are totaled for all courses; then the total credit points are divided by the total credit hours. Courses with grade symbols of P, NC, *** (grade not yet entered), W, I and IP are excluded from calculations. All standard letter grades (A-F) are included in the GPA, including grades of F earned for courses graded on a pass/fail basis. Grades of I that are not completed within one year are converted to F grades and calculated in the GPA at the end of the one-year grace period. Below is example GPA calculation for a hypothetical semester.

Grade Earned: A;	Credit Points per Hour: 4.0; x Credit Hours: 4.0 = Credit Points in Course: 16.0
Grade Earned: A-;	Credit Points per Hour: 3.7; x Credit Hours: 4.0 = Credit Points in Course: 14.8
Grade Earned: B+;	Credit Points per Hour: 3.3; x Credit Hours: 4.0 = Credit Points in Course: 13.2
Grade Earned: P;	Credit Points per Hour: —; x Credit Hours: 3.0 = Credit Points in Course: — (excluded)
Grade Earned: F;	Credit Points per Hour: 0; x Credit Hours: 3.0 = Credit Points in Course: 0
	Total of 15 credit hours with 44 credit points, so $44/15 = 2.93$ GPA

For individual GPA calculations related to academic standing and graduation from a college or school, students should refer to their academic dean's office.

Credit/No Credit

Students who wish to take course work for no credit must indicate this at the time they register for classes. Changes in credit registration are not permitted after the drop/add deadline in the summer or after the third Friday of the semester in the fall and spring. Tuition is the same whether or not credit is received in a class.

Pass/Fail (P/F)

Students should refer to the college and school sections of this catalog to determine the number of pass/fail credit hours that may be taken in a given semester or credited toward a bachelor's degree. Exceptions to the pass/fail regulations are permitted for certain courses that are offered only on a pass/fail basis.

The pass/fail option is only available if the course was built to allow the pass/fail option. Students who wish to register for a class on a pass/fail basis should do so when registering for the class.

Changes to or from a pass/fail basis are not permitted after the third Friday of the semester in the fall and spring or after the drop/add deadline in the summer. Prior to that date, students wishing to change a class's grading status from graded to pass/fail can do so in the MyCUInfo portal by first clicking on the "REgister for Classes Add, Drop or Swap Class" link on the "Academics / Schedule" tab. Then students can click on the "edit" option under the "Enroll" menu.

Grades of D- and above are considered passing grades. P grades do not affect student GPAs.

Variable Credit

Select courses, such as independent study courses, are offered as variable credit. Students should consult their academic advisor and designate the number of credit hours they wish to receive for the class at the time of registration.

Degrees & Graduation

Graduation

Students are eligible to graduate at the close of the term in which they successfully complete all requirements for their declared degree and major. Degrees are conferred at the close of fall semester, spring semester and summer session. Students must apply for graduation through MyCUInfo by the published deadline for the term in which they complete degree requirements. Instructions for applying and important dates and deadlines are available on the Office of the Registrar's Graduation & Commencement (<http://www.colorado.edu/registrar/students/graduation>) webpage. Individual colleges and schools may require additional processes for students completing their degrees.

Academic Program Discontinuance

In the event a degree program is discontinued, students currently enrolled in the program have a four-year period in which to complete their degree requirements. This four-year period starts at the end of the academic year in which the Colorado Department of Higher Education (CDHE) takes action to discontinue the program. No new or returning students will be admitted into a discontinued degree program. Students not completing the degree requirements in the four-year period are not permitted to receive the discontinued degree. In such cases, credit hours accumulated may be applied to the overall number of credit hours required toward graduation, but the student must seek the advice of their college or school to determine how these credit hours might apply to a new degree program.

Commencement

A general commencement ceremony is held in May for all students who have graduated or anticipate to graduate in a given academic year (fall, spring and summer). This ceremony is open to the public and no tickets are required. Many departments, colleges and schools hold recognition ceremonies in both fall and spring semesters. For details about the ceremony, visit CU Boulder's Commencement (<http://www.colorado.edu/commencement>) website.

Diplomas

Please see the Academic Records (p. 15) section.

Registration & Enrollment

Registration

Visit the Office of the Registrar's Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage for specific academic and financial dates and deadlines. Students should also consult individual college and school sections of this catalog and their dean's office for additional information on special requirements and procedures. The following registration policies are intended to serve as general guidelines.

Students who require accommodations because of a disability should visit the Office of Disability Services (<http://www.colorado.edu/disabilityservices>) website or call 303-492-8671.

Confirmation Deposit

All new degree students pay a one-time \$200 confirmation deposit when they first confirm their intent to enroll at CU Boulder. Students are not permitted to register if the university has not received the deposit.

Confirmation deposits are refunded to students upon graduation or official withdrawal from CU Boulder within established dates and guidelines. All refunds are reduced by any outstanding financial obligations. Interest earned from confirmation deposits is used for student financial aid.

Questions regarding the confirmation deposit policy should be directed to the Office of Admissions, 303-492-6301.

MyCUInfo

Student registration and other important information and services are available through the student portal, MyCUInfo (<https://mycuinfo.colorado.edu>). Students access the MyCUInfo portal using a secure CU login name and IdentiKey password. For more information and registration instructions, visit the Registration (<http://www.colorado.edu/registrar/students/registration>) webpage.

Registering for Classes

All CU Boulder students register for classes via MyCUInfo. Students also use the MyCUInfo portal to check their assigned registration date and time, view any holds that may prevent registration (see "Holds"), see to-do lists and obtain advisor name and contact information.

New freshmen and transfer students receive their registration instructions and information during the New Student Welcome Experience. Continuing students may consult the academic calendar, view their registration appointments in the student portal, and also are notified via email each semester of registration periods and requirements.

Registration instructions are also available on the Enroll in Classes (<http://www.colorado.edu/registrar/students/registration/enroll>) webpage.

Holds

A hold may be placed on a student's record for a number of reasons, including but not limited to financial, advising, scholastic, conduct and health. A hold may prevent a student from registering, returning to school, obtaining an official transcript or receiving a diploma. Students should resolve holds as quickly as possible by contacting the appropriate campus office identified in the hold in the student portal.

Special Registrations

Intercampus Enrollment Program

CU Boulder students who are enrolled in at least one class on the Boulder campus may be allowed to register for up to two classes or 6 credit hours, whichever is greater, on another University of Colorado campus.

Graduate students should check with the Graduate School for exceptions to the home-campus registration requirement and limitations on credit hours at the host campus.

Generally, classes taken at other CU campuses must be required for graduation or unavailable on the Boulder campus in a given term, or the classes must conflict with another required class in which the student is enrolled.

Boulder students exercising this option pay tuition for their total credit hours at Boulder campus rates. Intercampus Enrollment forms and instructions are available on the Registration Programs (<http://www.colorado.edu/registrar/students/registration/registration-programs>) webpage.

Intercampus students are registered in host campus classes after continuing home students have had the chance to enroll. This excludes the Anschutz campus, where students will be enrolled on the first day of classes. Students must adhere to the add/drop deadlines of the host campus when making changes to their intercampus enrollment.

Boulder campus students who wish to take course work on another campus of the University of Colorado, but not through the Intercampus Enrollment program, may be able to register on that campus independent of Boulder-campus registration. However, they must apply for admission to and follow the registration procedures established by the other campus. Students should check with their dean's office for approval and course applicability to their degree program.

Late Registration

Non-enrolled students may be allowed to register late for a fall or spring semester. However, as of the third Friday of the semester, eligible students are assessed a \$100 late registration fee (this is different than charges assessed for late payments of the university bill). The late registration fee also applies to graduate students registering as candidates for degree or for thesis credit hours. For more information, visit the Drop a Class (<http://www.colorado.edu/registrar/students/registration/enroll/drop-class>) webpage.

University Employees and Dependents

CU Boulder offers a tuition benefit to eligible employees and their dependents. For current benefit information, visit Employee Services' Employee Tuition Waiver Benefit (<https://www.cu.edu/employee-services/employee-tuition-benefit>) website.

Auditing

Individuals who have not been admitted to the university and who wish to attend regular classes may do so by obtaining auditor's status. Auditors must receive permission and obtain a signature from course instructors during the first week of class to be formally added to the roster.

Audited courses will not appear on any transcript, formal or informal, as no credit is awarded. Registered auditors receive class instruction, learning management system access and library privileges. Being

an auditor at the University of Colorado Boulder does not guarantee eligibility for regular degree or nondegree status.

Note: Admitted degree students, either enrolled or suspended, are not permitted to audit courses. If an admitted degree student is interested in participating in a class without receiving credit, the student must enroll in the course for no credit. Courses taken for no credit are assessed the same tuition rate as courses taken for credit.

Community Auditors

Community members age 18–54 can register for the Community Auditors program through Continuing Education by completing the Community Auditor Registration Form on the Community Auditors (<http://ce.colorado.edu/programs/community-auditors>) webpage. Contact ceregistration@colorado.edu or call 303-492-5148 for more information.

Community auditors pay for three credit hours at the in-state undergraduate tuition rate in the College of Arts and Sciences. The cost is a flat rate and, with instructor permission, auditors may audit as many classes as desired. Nonrefundable payment is due at the time of enrollment.

Senior Auditors Program

Individuals 55 years and older can register for the Senior Auditors Program through the CU Boulder Alumni Association and qualify for reduced rates. Registration and eligibility information is available on the Senior Auditors (<http://www.colorado.edu/alumni/programs/senior-auditors>) webpage. Contact the Alumni Association at 303-492-8484 for more information about this program.

Dropping & Adding Classes

Procedures

Students can add or drop classes from their schedule in the MyCUInfo portal or app. For more information, visit the Enroll in Classes (<http://www.colorado.edu/registrar/students/registration/enroll>) webpage.

Deadlines

For specific drop and add deadlines for fall and spring semesters, visit the Academic Calendar (<http://www.colorado.edu/registrar/students/academic-calendar>) webpage. For summer deadlines, visit Summer Session's Calendars (<http://www.colorado.edu/summer/resources/calendars>) webpage.

Add a Class

- Students add classes in MyCUInfo during designated registration and schedule adjustment periods each term without needing approval.
- After this time period, students must contact the instructor or the instructor's department to add a class. After the add deadline has passed, students may only enroll in a class with their dean's permission in addition to instructor permission.

Drop a Class

- No Record Drop: Students may drop individual classes in MyCUInfo with a refund and no record (no W grades) through the third Wednesday of the fall or spring semester (summer dates vary).
- Drop with Record: After the third Wednesday of the semester, students may continue to drop classes without instructor/advisor approval in MyCUInfo through Friday of the tenth week of the fall or spring semester (summer dates vary). However, tuition and fees are assessed and grades of W appear on the transcript.

- Late Drops: After the 10-week drop deadline, instructor and dean signatures are required to drop a class. Some colleges may require additional approval or processes, such as petitioning the dean (students should check with their school or college). Class drops are generally not approved after this date except in extraordinary circumstances. Tuition and fees are assessed and grades of W appear on the transcript.

Students dropping all of their classes should see the Withdrawal (p. 22) section.

Withdrawing from CU

A withdrawal from the University of Colorado Boulder occurs if you:

- never register for classes in a fall or spring semester; or
- drop all classes for a semester; or
- submit a withdrawal request to the Office of the Registrar.

A student who desires to withdraw from the university and drop all Main Campus classes should visit the Office of the Registrar's Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage and review the current term's withdrawal calendar (http://www.colorado.edu/registrar/sites/default/files/attached-files/spring2017withdrawal_info.pdf) to understand the potential impacts of withdrawing. Failure to withdraw properly may result in failing grades recorded for every class and liability for the full amount of tuition and fees for that term.

Rules for withdrawing may vary with each college and school. Students anticipating a withdrawal should consult their advisor and/or dean's office, and read the withdrawal information on the Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

Withdrawing students (including students applying for a graduate leave of absence) with Federal Perkins/NDSL loans must complete a loan exit interview and clear all outstanding financial balances before leaving the university. Failure to do so results in a hold on the student's record. This hold prevents receipt of a diploma or an academic transcript of work at the university and registration for future terms. Students can complete a loan exit interview by contacting University Student Loans & Debt Management in the Bursar's Office at 303-492-5571, toll free at 800-925-9844 or TTY 303-492-3528.

Undergraduate students who withdraw and then wish to return to the university have two semesters (plus summer) from their last graded semester to return to the university without having to reapply for admission. Graduate students can apply for an approved leave of absence. Details are available on the Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

For more information, contact the Office of the Registrar at 303-492-6970 or withdraw@colorado.edu. For information about tuition and fee obligations for withdrawing students, see either the Undergraduate Tuition and Fee Policies (p. 120) or the Graduate Tuition and Fee Policies (p. 873) sections.

Graduate Leave of Absence

Graduate and MBA students **must** apply for a leave of absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) or be discontinued from the university. Graduate students who wish to take a leave of absence from the university must submit an application by the published deadline in a given term and get approval from their

department and their school, college or program to avoid having to reapply.

Graduate students taking an approved leave of absence are allowed two inactive semesters (plus summer), and are guaranteed a place in their current college or school and in their current major when they return to the university. Students must not have any disciplinary holds and must be in good academic standing with the university. Students registered for the semester in which they plan to begin their leave of absence must formally withdraw. See the "Withdrawal Procedures" section above.

A nonrefundable \$50 program fee is required at the time of application. For an application and more information, visit the Leave of Absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) webpage.

Undergraduate Leave of Absence

Undergraduate students can take a leave of absence from the university for up to two semesters (plus summer) without having to reapply to CU Boulder. Eligible degree-seeking undergraduate students may maintain certain university benefits while taking leave from the university. Some benefits (such as Recreation Center access and health insurance through Wardenburg Health Services) are only available for an additional fee. Signing up for these elective benefits requires submitting an application and a nonrefundable \$50 administrative fee.

For an application and more information, visit the Leave of Absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) webpage.

Law Student Withdrawal and Leave of Absence

A law student who desires to voluntarily withdraw from the university and drop all classes during the first (fall) semester must reapply for readmission, may only be readmitted to resume in a subsequent fall semester, and shall receive no readmission preference. Students who withdraw after completing the fall semester but before beginning on the second (spring) semester, must reapply for admission, shall normally be expected to wait until the next spring semester to resume their studies, and shall receive admission preference only in the next regularly scheduled spring semester. Law students **must** apply for a leave of absence (<http://www.colorado.edu/registrar/students/withdraw-cu/leave-of-absence>) or will be discontinued from the university. Department and college approval is required on the application.

Active Duty

Students who are military personnel, fire fighters and police officers who are called to active duty and/or to help with disasters may request to go on a leave of absence. These students should contact the Office of the Registrar. For more information, visit the Active Duty (<http://www.colorado.edu/registrar/students/withdraw-cu/active-duty>) webpage.

Retroactive Withdrawal

In certain situations, colleges, schools and programs accept petitions for retroactive withdrawals from one or more completed semesters. Students must clearly demonstrate that they experienced extenuating circumstances beyond their control that prevented them from withdrawing by the established deadline (e.g., serious cases of injury). Such petitions require specific and detailed documentation from appropriate licensed professionals in order to be considered. Students who believe they have encountered life events that may make them

eligible for a retroactive withdrawal should meet with their academic advisor before taking any action.

Retroactive withdrawals are seldom granted, and the review process may take several months. For petitions that are approved, grades of W will be recorded for all classes taken in the semester, irrespective of the original grade. Students who must withdraw within a given term due to extenuating circumstances should review the Academic & Financial Considerations (<http://www.colorado.edu/registrar/students/withdraw-cu/considerations>) webpage. Withdrawing students who have received financial aid should review the Financial Aid Withdrawal Policy (<http://www.colorado.edu/financialaid/policies/financial-aid-withdrawal-policy>) webpage.

Research

Research and innovation at CU Boulder is changing the world. While CU Boulder researchers, faculty and staff lead the charge, this transformational work includes increasing collaborations with undergraduate and graduate students, postdocs, entrepreneurs, and government and industry partners.

At the heart of this focus are the diverse contributions of a wide range of world-class experts, working together in new and innovative ways to accelerate ideas through the entire innovation life cycle, from idea to impact.

Explore the diverse avenues through which CU Boulder innovators are crafting global change—and learn how you can participate.

Major Research & Innovation Services and Initiatives

Office of Contracts and Grants

The Office of Contracts and Grants (<http://www.colorado.edu/ocg>) (OCG) partners with faculty and staff to prepare and submit proposals, including budgets, for external research funding. OCG is authorized to negotiate and accept sponsored research agreements on behalf of the Regents, monitor and provide guidance throughout the life of an award, and ensure final project closeout.

Office of Research Integrity

The Office of Research Integrity (<http://www.colorado.edu/innovate/ori>) supports CU Boulder's commitment to scientific and ethical integrity, as well as academic excellence in all research activities with which our students, faculty and staff are associated.

Office of Animal Resources

The Office of Animal Resources (<http://www.colorado.edu/innovate/office-animal-resources-oar>) is a service center responsible for providing high quality animal care, veterinary care and support for the research and teaching missions of CU Boulder.

Office of Postdoctoral Affairs

The Office of Postdoctoral Affairs (<http://www.colorado.edu/postdoctoralaffairs>) enhances and supports postdoctoral training and career development, helps build a sense of community among postdocs, and serves as a resource to campus and affiliated national labs.

Research Development and Funding Opportunities

Research Development (<http://www.colorado.edu/innovate/fundingawards>) offers a variety of tools and resources to help faculty,

students and staff identify and develop opportunities for scholarly activities.

Office of Industry Collaboration

The Office of Industry Collaboration (<http://www.colorado.edu/industry>) promotes and supports synergistic opportunities for engagement between CU Boulder and industry and business, strengthening connections that provide benefits to partners, students and local, state and national economies.

Technology Transfer Office

The Technology Transfer Office (<http://www.colorado.edu/techtransfer>) (TTO) ensures that CU Boulder and UCCS's world-class research creates world-class impact, bringing together industry partners, entrepreneurs and investors to help researchers solve important problems and improve quality of life worldwide.

AeroSpace Ventures

The CU Boulder AeroSpace Ventures (<http://www.colorado.edu/aerospaceventures>) initiative creates a collaborative environment in which CU Boulder's aerospace engineering and earth and space science faculty, students and industrial researchers work together to solve complex problems that lead to new discoveries and innovations.

Grand Challenge

CU Boulder's response to the Grand Challenge (<http://www.colorado.edu/grandchallenges>), *Our Space. Our Future.*, fuses CU Boulder's unique strengths in earth, space and social sciences with new technologies and partners to address the pace and pattern of changes for our environment, our resources and our planet.

Innovation & Entrepreneurship

CU Boulder fosters an environment for innovative thinking and the entrepreneurship spirit, offering a variety of programs and resources (<http://www.colorado.edu/entrepreneurship>) developed to foster and support creative ideas for new initiatives. From academic programs and student groups to community-wide support, you will find the resources and people to help you develop and launch ideas.

Research Institutes

CU Boulder's 11 research institutes (<http://www.colorado.edu/research/research-institutes>) account for more than half of all sponsored research dollars at the university—and they employ some of the most productive researchers in the country. With more than 900 researchers, students and supporting staff, the institutes make a major contribution to the university's research and education missions as well as the local and area economy.

Research Centers

In addition to the large research institutes, there are nearly 90 research centers (<http://www.colorado.edu/research/research-centers>) housed within academic departments or as subsets of the research institutes themselves. They can be found in all fields of the university, including humanities and the arts, social sciences, natural sciences, engineering, business and law.

To learn more about our major research & innovation services and initiatives, visit the Research & Innovation Office (<http://www.colorado.edu/innovate>) webpage.

Student Affairs

Health & Wellness

Wardenburg Health Services

Wardenburg Health Services is the primary health care resource for CU Boulder students. Through comprehensive care and education we strive to give students the skills and knowledge they need to develop healthy life-long habits. To learn more, visit Wardenburg Health Services (<http://www.colorado.edu/health>).

Counseling and Psychiatric Services

Counseling and Psychiatric Services offers confidential, on-campus mental health and psychiatric services for a variety of concerns such as academics, anxiety, body image, depression, relationships, substance use and more. To learn more, visit CAPS (<http://www.colorado.edu/health/counseling>).

Disability Services

Students with disabilities are one of the many groups that make up our campus community and a diverse community broadens our understanding and appreciation for the contributions of each individual. We provide leadership and guidance regarding accommodations and universal access, which requires a collaborative relationship among all members of the university community. To learn more, visit Disability Services (<http://www.colorado.edu/disabilityservices>).

Automatic Enrollment in Student Gold Health Insurance

Students registered for six or more undergraduate credit hours or one or more graduate credit hours will be automatically enrolled in CU's Student Gold Health Insurance Plan and charged the semester premium every fall unless the selection is changed by the semester deadline.

Exceptions to automatic enrollment: new summer students, non-degree seeking Continuing Education, Leave of Absence Program, Study Abroad, Evening MBA program, or exclusively Be Boulder Anywhere courses.

Students can add the Campus Care supplement to their existing health insurance for basic coverage on campus or waive both university plans by providing proof of health insurance by the semester deadline.

For more information, visit the Health Insurance Requirement (<http://www.colorado.edu/health/insurance/health-insurance>) webpage.

Note: Plans available through the health insurance marketplace meet CU's health insurance requirement. Colorado students may sign up through the Connect for Health Colorado (<http://connectforhealthco.com>) website. Nonresident students may sign up through their home state health exchange or through the national HealthCare.gov (<https://www.healthcare.gov>) website.

Housing

Residence Halls

Living on campus in a university residence hall is considered an important part of student life. Over 7,000 students are accommodated in double rooms, multiple occupancy rooms, singles and apartments in 24 residence halls. All halls are coeducational and range in sizes from 100 to 500 students. Each fall the residence halls provide a new home for over

6,000 entering freshmen. Subject to the availability of space, all freshmen are required to live in a residence hall for two academic semesters (a summer term does not count as an academic semester), unless they are married or live with parents and have permission to commute. Requests for permission to reside off campus for other reasons are considered on their merits, taking into account individual circumstances.

The residence halls provide a range of services and programs designed to support the intellectual, social and personal growth of single student residents. All residence halls, for example, offer tutoring services to residents at no cost. Additionally, a variety of academic and social programs are sponsored by residence hall and other university staff.

The residence hall dining service hours are planned to be convenient for most students' schedules. Campus Dining Services provides healthy food choices to diverse students which emphasizes convenience, value and variety. The dining program permits students (regardless of hall assignment) to eat in any residence hall dining center.

For more information about university housing options and/or permission to reside off campus, prospective students may contact:

Occupancy Management
Center for Community, Room S300
159 UCB
Boulder, CO 80309-0159
Email: studenthousing@colorado.edu

Application for Residence Hall Housing

New freshman and transfer students receive information from Housing & Dining Services about applying for housing after they have confirmed their intent to attend the university. Housing assignments are made on a first-come, first-assigned basis. The earlier applications are submitted, the better chance students have of being assigned to the residence hall of their preference. (Please note that Housing & Dining Services does not guarantee assignment to a particular building or program, type of accommodation or specific roommate.)

Note: Application for admission to the university and application for housing are two separate transactions. For information regarding admission notification and confirmation procedures, see the undergraduate Admissions (p. 97) section.

All housing contracts are for the full two-semester academic year or remainder thereof. An early termination of contract is subject to financial penalties as stated in the residence halls contract.

Housing Security Deposit

All students who live in the residence halls are required to pay a one-time security deposit of \$300 at the time of application. This security deposit is held by Housing & Dining Services and is released to the tuition and fee account within 60 days after the expiration of the housing contract. This deposit is forfeited by students who cancel after May 31, or students who do not live in the residence halls for the entirety of the housing contract period.

The security deposit required for housing is in addition to the confirmation deposit required for admission to the university.

Room and Board Rates per Semester

Residence hall room and board rates per person, per semester, for the 2017–18 academic year are:

Roommate(s) & community bath	\$6,999
Individual space & community bath	\$7,730
Roommate(s) & attached bath	\$7,730
Individual space & attached bath	\$7,950
Roommate(s) & apartment	\$8,088

A meal plan of 19 or 15 meals per week is included.

Off-Campus Housing

Off-Campus Housing & Neighborhood Relations (a service of CUSG) maintains listings of apartments, houses and rooms for rent in the Boulder area. Currently enrolled students may view listings and connect with potential roommates on Ralphie's List, CU's rental database, on the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website. The office also maintains a detailed list of apartments and property management companies available for download or pickup in the office.

The department has a staff attorney available on Tuesdays and Fridays to advise students about leases, security deposits, maintenance issues and roommate and landlord conflicts. Office assistants will help students locate properties and answer questions about the surrounding neighborhoods.

During the spring semester, the office sponsors two off-campus housing fairs where landlords, property managers and related businesses offer their services to students in a trade-show format.

For additional information, visit the Off-Campus Housing & Neighborhood Relations (<http://offcampushousing.colorado.edu>) website or call 303-492-7053. Office hours are 8 a.m.–5 p.m., Monday–Friday. Summer hours are 7:30 a.m.–4:30 p.m.

Note: First-year students must receive written permission from Housing & Dining Services before obtaining off-campus accommodations for the fall and spring semesters of their first year, as well as for the summer session preceding their fall start date.

The University of Colorado Children's Center provides child care for the children of students, staff, faculty and Graduate & Family Housing residents.

Graduate & Family Housing offers an affordable, convenient and comfortable living environment that serves the needs of a diverse population of students at CU. We are home to residents from over 70 nations and offer a variety of apartment types and sizes, flexible leases and community-building programs and events. To learn more, visit the Housing & Dining Services' website (<https://living.colorado.edu>) or call, write or email the Graduate & Family Housing Office at the address provided.

Graduate & Family Housing Office
1350 20th Street, #A10
University of Colorado Boulder
Boulder, CO 80302
T: 303-492-6384
graduatefamilyhousing@colorado.edu

Student Conduct & Colorado Creed

Student Conduct Code

The purpose of the Office of Student Conduct and Conflict Resolution is to support community safety, student growth and success by helping students:

- Reflect on decisions
- Be accountable for their actions
- Make decisions in congruence with community standards of conduct

Clarification of Values

1. Students will have a greater understanding of the impact their decisions have on others.
2. Students will gain an understanding of the institutional values reflected through policies and practices.
3. Students will be able to identify ways in which they can make decisions in congruence with community standards of conduct.
4. Students will gain a better understanding of the importance of personal accountability and responsibility.
5. Students will be able to identify the harms caused by their decisions and determine the best method for repairing those harms.
6. Students will be able to reflect on their choices and develop individual goals for success.
7. Students will have a greater understanding of campus resources.

Authority

Article 7, Part B, of the Laws of the Regents requires each campus to develop a student code of conduct. The Office of Student Conduct is authorized to establish and administer this policy. Any questions regarding interpretation of this code or any of its provisions should be directed to the vice chancellor for student affairs or his/her designee for final determination. Questions regarding behavioral problems should be directed to:

Office of Student Conduct
University of Colorado Boulder, 10 UCB
Boulder, CO 80309
Phone: 303-492-5550

Jurisdiction

This policy governs:

- Student conduct that occurs on or as it relates to university property, or at official functions and university-sponsored programs conducted away from the campus. University property is denied as land, buildings and facilities in possession of or owned, used or controlled by the university or funded by university budgets.
- Student conduct that occurs off university property is subject to this policy if it: (1) adversely affects the health, safety or security of any member of the university community or the mission of the university; or (2) involves any records or documents of the university. For purposes of this policy, the university's mission is broadly denied to include both its academic goals and the importance of developing civic responsibility in its students.

Student Conduct Process

Informal Resolution

- This process may generally include, but is not limited to, a meeting with a conduct officer, completion of the agreement, and/or participation in the Restorative Justice program as is referenced in H.5.

- During the meeting, if the conduct officer determines that the informal resolution process may be appropriate, the conduct officer will offer it as an option to the student and address any questions the student may have about the process. If the student accepts responsibility for the alleged prohibited conduct and agrees to and completes the agreement developed during the meeting, then the OSC will consider the matter to be resolved informally.

Formal Resolution

- This process generally includes written notice of the factual allegations and alleged violations of the Student Conduct Code, the opportunity to meet with the conduct officer to address the allegations and provide information to the conduct officer, the conduct officer reviewing the allegations and making factual and violation determinations based on the preponderance of the evidence, and written notice to the student of the conduct officer's determinations.

All students residing in Housing & Dining Services facilities are subject to Residence Hall policies or any policy properly communicated through Housing and Dining Services staff. For more information, visit the Residence Hall Handbook (<https://housing.colorado.edu/policies-procedures/residence-hall-handbook>) webpage.

Proceedings initiated under this policy are separate from civil or criminal proceedings that may relate to the same incident. Investigations or conduct proceedings by the university are not postponed while criminal or civil proceedings are pending, unless otherwise determined by the conduct officer.

The unexcused failure of a student to appear and/or respond to the conduct process does not prevent the university from proceeding with the conduct process.

Cases involving sexual misconduct (including sexual assault, sexual harassment, intimate partner violence and gender/sex-based stalking), protected class discrimination and harassment and any related retaliation are subject to the Office of Institutional Equity and Compliance policies. For more information, visit the Office of Institutional Equity and Compliance (<http://www.colorado.edu/institutionalequity>) website or call 303-492-2127.

Excerpts from the Colorado Revised Statutes regarding hazing, ethnic intimidation and riots are also presented. Colorado law prohibits persons convicted of rioting from enrolling in state-supported universities/colleges for 12 months following the date of a conviction.

For information about classroom behavior, see the following website: www.colorado.edu/policies/classbehavior.html (<http://www.colorado.edu/policies/classbehavior.html>).

Colorado Creed

The Colorado Creed, developed by students in 2003, is a social code of conduct and a lifestyle by which students at CU Boulder live. The text of the creed is:

As a member of the Boulder community and the University of Colorado, I agree to:

- Act with honor, integrity and accountability in my interactions with students, faculty, staff and neighbors.
- Respect the rights of others and accept our differences.

- Contribute to the greater good of this community.

I will strive to uphold these principles in all aspects of my collegiate experience and beyond.

For more information, visit the Colorado Creed (<http://www.colorado.edu/creed>) website.

Student Resources

Students can take advantage of many on-campus resources, from Career Services to the Office of Diversity, Equity, and Community Engagement to Wardenburg Health Services. Visit the Division of Student Affairs (<http://www.colorado.edu/studentaffairs>) to learn more.

Student Data Privacy

Annual Notice to Students

The University of Colorado complies fully with the provisions of the Family Educational Rights and Privacy Act (FERPA) of 1974. The act was designed to protect the privacy of student education records, to establish the right of students to inspect and review their education records and the right to request an amendment or correction.

University guidelines explain procedures to be used by the institution for compliance with the provisions of the act. For more information, visit The Family Educational Rights and Privacy Act (FERPA) (<http://www.colorado.edu/registrar/students/records/ferpa>) webpage or contact the Office of the Registrar.

Students wishing to review their education records must schedule an appointment with the Office of the Registrar and present proper identification. All other records inquiries must be directed to the appropriate office, e.g., Office of Financial Aid, Bursar's Office, etc.

Students may not inspect the following, as outlined by the act: financial information submitted by their parents, confidential letters that they have waived their rights to review or education records containing information about other students, in which case the institution will permit access only to that part of the record that pertains to the inquiring student. Records that may be inspected include admissions, academic and financial aid files and cooperative education and placement records. Students may access many records directly via the MyCUInfo portal.

The Family Educational Rights and Privacy Act affords students certain rights with respect to their education records. They are:

1. The right to inspect and review education records within 45 days of the day the university receives their request for access.
2. The right to request amendment of education records that they believe are inaccurate or misleading.
3. The right to consent to disclosure of personally identifiable information contained in their education records, except to the extent that FERPA authorizes disclosure without consent.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the university to comply with the requirements of FERPA.

Directory Information

The following items of student information have been designated by the University of Colorado Boulder as public or "directory" information:

- student name
- student address (including designated local, mailing and home)
- local telephone number (not those defined as home or cell)
- campus email address
- dates of attendance
- enrollment status (e.g., full-time or part-time)
- class (e.g., freshman, sophomore)
- school/college/program or division of enrollment
- previous educational institutions attended
- major/minor fields of study
- university-recognized honors and awards, and degrees, honors or awards applied for or conferred (e.g., certificates, thesis and dissertation titles) and dates conferred
- participation in officially recognized activities/sports, including height and weight of athletes
- student employment status (e.g., teaching assistant, GPTI, resident advisor, work-study, tutor or other) and positions held at the university and dates of employment, as well as GPTI/teaching assistant Faculty Course Questionnaire (FCQ) ratings
- College Opportunity Fund application and authorization status
- expected date of completion in enrolled course of study
- student photo

Such information may be disclosed by the institution at its discretion, unless the student has explicitly requested in writing that it not be released.

Withholding Directory Information

Students have the right to withhold directory information from inquirers. To restrict the release of directory information, students must bring a photo ID to the Office of the Registrar during business hours to complete a privacy form.

Student Consent for Release of Confidential Information

Students may authorize the university to release educational records to parents, spouses or other third parties by granting consent in MyCUInfo. The Privacy Settings (<http://www.colorado.edu/registrar/students/records/privacy>) webpage has more information about various options for granting and restricting access to student records.

Release of Disciplinary Information

Provisions of the Family Educational Rights and Privacy Act of 1974, as amended by the Higher Education Amendments of 1998, govern access to a student's academic transcript or conduct file. The student and/or those university officials who demonstrate a legitimate educational need for disciplinary information may have access to the student's conduct file.

Parent(s) who provide proof that a student is a dependent as defined in Section 152 of the Internal Revenue Code of 1954 (i.e., a copy of the last federal income tax return listing the student as a dependent) may have access to the student's conduct file without written consent of the student. In this case, parents may have access to a conduct file, even if the student has requested otherwise.

In addition, parent(s) may be notified if a student under 21 is found responsible for a violation involving use or possession of alcohol and controlled substances. All other inquiries, including but not limited to inquiries from employers, government agencies, news media, family, friends or police agencies, require a written release from the

student before access to university conduct files is granted. Exception: information may be released pursuant to a lawfully issued subpoena and as provided by the Campus Security Act as amended by the Higher Education Amendments of 1992.

The Campus Security Act permits higher education institutions to disclose to alleged victims of any crime of violence (e.g., murder, robbery, aggravated assault, burglary, motor vehicle theft, arson) the results of the conduct proceedings conducted by the institution against an alleged perpetrator with respect to such crime. The Campus Security Act also requires that both the accused and the accuser be informed of campus conduct proceedings involving a sexual assault.

Tuition Classification

In-State and Out-of-State Tuition Classification

Tuition classification is governed by state law and by judicial decisions that apply to all public institutions of higher education in Colorado. The University of Colorado does not have discretion to make exceptions to the rules as established by state law.

New students are classified as in-state or out-of-state residents for tuition purposes on the basis of information provided on their admission application and other relevant information. Applicants may be required to submit evidence substantiating their claim of in-state eligibility.

Current nonresident students who believe they have become eligible for a change to in-state status must submit a petition with documentation in order to have their status reviewed. The petition requirements, deadlines for submission, explanation of Colorado tuition classification statutes and Office of the Registrar contact information are available on the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

Basic Requirement for Establishing Colorado Residency

To become eligible for in-state residency, a person must establish legal residence in Colorado. Legal residence, or "domicile," is defined as a person's true, fixed and permanent home and place of habitation. No person may establish domicile in Colorado solely for the purpose of obtaining in-state tuition benefits. An individual who seeks to establish domicile while registered as a student is presumed to establish Colorado domicile solely for tuition purposes unless there is clear and convincing evidence to the contrary.

Colorado in-state tuition classification requires Colorado domicile for 12 consecutive months. A person must be 22 years of age or older, married, a graduate student or an emancipated minor in order to begin the 12-month period of establishing domicile in Colorado. Unemancipated minors qualify for in-state status if their parents have been domiciled in Colorado for at least one year.

Evidence of Domicile

Establishing Colorado domicile includes actions that would be expected of any permanent resident. Pursuant to Colorado law, the following may be considered evidence of domicile:

- filing a tax return in Colorado and, if applicable, payment of Colorado state income tax

- Colorado driver's license or Colorado ID card
- Colorado vehicle registration
- voter registration in Colorado
- graduation from a Colorado high school
- lease or deed showing permanent occupancy of residential real property in Colorado
- continued residence in Colorado while not enrolled as a student and during semester breaks
- permanent employment or acceptance of future employment in Colorado
- any other factor particular to the individual that tends to establish the necessary intent to make Colorado a permanent home.

No single factor constitutes proof of domicile. All evidence, both positive and negative, is considered. Not all of the listed items are necessary, but individuals should take action on any factors that are appropriate in their circumstance.

Domicile Exceptions

Colorado tuition law provides the following rare exceptions to the one-year domicile requirement:

- Colorado National Guard members
- active duty military stationed in Colorado and their dependents in certain circumstances
- honorably discharged members of the U.S. Armed Forces and their dependents in certain circumstances
- returning active-duty military members
- Canadian military stationed in Colorado
- ASSET students with three years of Colorado high school and graduation
- children of new faculty members at Colorado state colleges and universities
- employees of companies moving to Colorado receiving government economic incentives
- Western Regional Graduate Program enrollees in specific major fields of study
- plus others (see Exceptions to One-Year Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage)

Requirements, including spouse and child eligibility, are detailed on the Exceptions to One-Year Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

Unemancipated Minors

Students under age 23 who depend on their parents for support may qualify for in-state tuition if either of their parents, regardless of custody, has been domiciled in Colorado for 12 consecutive months preceding the first day of class in a given semester, even if the student resides elsewhere. In certain circumstances, students may qualify through their parents up to age 23.

Emancipation

An emancipated minor is someone under age 23 who demonstrates total financial and residential independence. This means the student's parents have entirely surrendered the right to the student's care, custody and earnings, and make no provision for support of any kind. Emancipation

is very rare; undergraduates under age 23 who do not have a parent domiciled in Colorado are highly unlikely to be classified as a Colorado resident student.

Students who give false information to evade payment of out-of-state tuition or who fail to provide timely notice of their loss of in-state eligibility are subject to retroactive assessment of out-of-state tuition, as well as disciplinary and legal actions.

For more information on all requirements, see the Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>) webpage.

University Policies Alcohol & Other Drugs Alcohol and Other Drugs

In order to create the best possible environment for teaching and learning, the University of Colorado Boulder affirms its support for a responsible campus policy that addresses the inappropriate use of alcohol and other drugs.

In compliance with the federal Drug Free Schools and Communities Act, the University of Colorado Boulder prohibits the unlawful manufacture, possession, use or distribution of a controlled substance (illicit drugs and alcohol) of any kind and in any amount. These prohibitions cover any individual's actions that are part of any university activities, including those occurring while on university property or in the conduct of university business away from the campus.

Information on policies, penalties, health effects and resources available to students and staff regarding alcohol and other drugs can be found on the Alcohol & Other Drugs Information (<http://www.colorado.edu/aod>) website.

These policies are also described by various university offices in several publications:

- **Campus housing:** *A Guide to Residence Hall Living*, available at the Department of Housing. Contact Residence Life, 303-492-7260. See also the Residence Hall Handbook (<https://housing.colorado.edu/resources-tips-policies-procedures/residence-hall-handbook>) webpage.
- **Student Conduct Code:** *Students' Rights and Responsibilities Regarding Standards of Conduct and Alcohol and Drug Policy*, available in the Office of Student Conduct, 303-492-5550. See also the Student Conduct Code Policies & Procedures (<http://www.colorado.edu/osccr/node/33/attachment>) handbook.
- **Safety:** Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>).
- **Student life:** *The Guide to Student Life*, distributed to new and continuing students. Resources available on CU Boulder's Students (<http://www.colorado.edu/students>) webpage.

Individual and group counseling for students with substance abuse concerns is available through the Counseling and Psychiatric Services department of Wardenburg Health Services. For more information, visit the Counseling and Psychiatric Services (<http://www.colorado.edu/health/counseling>) webpage or call 303-492-5654 (CAPS at Wardenburg) or 303-492-6766 (CAPS at C4C).

Smoking

For student health and the health of our community, smoking is prohibited in all campus buildings and on all campus grounds.

At this time, the use of smoking products of any sort shall be prohibited on all university-owned and operated campus grounds both indoors and outdoors. This smoking ban does not apply to public rights-of-way (sidewalks, streets) on the perimeter of the campus.

"Smoking," as used in this policy, means smoking any substance, including but not limited to, tobacco, cloves or marijuana. "Smoking products" include, but are not limited to, all cigarette products (cigarettes, bidis, kreteks, e-cigarettes, etc.) and all smoke-producing products (cigars, pipes, hookahs, etc.). University-owned and operated campus grounds include, but are not limited to: all outdoor common and educational areas; all university buildings; university-owned on-campus housing; campus sidewalks; campus parking lots; recreational areas; outdoor stadiums; and university-owned and leased vehicles (regardless of location). In keeping with university policy, the sale, distribution and sampling of all tobacco products and tobacco-related merchandise is prohibited on all university-owned and operated property and at university-sponsored events. Littering campus with remains of smoking products is prohibited.

This policy applies to all employees, students, visitors, contractors and externally affiliated individuals or companies renting university-owned space on university-owned and operated property campus grounds.

Campus Safety

Personal Safety on Campus

While the University of Colorado Boulder is a relatively safe place to be, the campus is not a haven from community problems. Through the joint effort of various organizations on campus, CU is committed to providing ample safety resources for faculty, staff and students.

Specific efforts to promote safety on campus include the provision of adequate lighting, police protection, educational programs and special prevention programs, such as the CU NightRide escort services and laptop and bicycle registration programs.

In compliance with the federal Clery Act, students and employees receive (at the start of the fall semester) information on campus security policies and programs, including crime statistics, in an Annual Security and Fire Safety Report (<http://www.colorado.edu/clery>). In any emergency or life-threatening situation, always call 9-1-1.

Members of the university community are encouraged to report any incident of threatening or harmful behavior to the University Police by calling 9-1-1 in an emergency or the non-emergency line, 303-492-6666. Other resources include the Office of Student Conduct at 303-492-5550, the Ombuds Office at 303-492-5077, and the CU Boulder Alcohol and Other Drugs Program at 303-492-5703.

Additional safety information can be found on the CU Police Department (<http://www.colorado.edu/police>) website and the Safety Website (<http://www.colorado.edu/safety>). For information on crime alerts, trends and safety tips, follow the CU Police Department on Twitter (@<https://twitter.com/cuboulderpolice>) and Facebook (CUBoulderPolice (<https://www.facebook.com/CUBoulderPolice>)).

Communication

Student Email

All CU students receive an email account from the university, which is an official means of sending information to students. Students are responsible for maintaining this CU email address. The official email address can be used by professors to contact students and provide course-related information. Administrative offices, such as the Office of the Registrar, use official email addresses to contact students and provide important information. Students are responsible for frequently checking their official CU email address. For more information on the student email policy, visit the Student E-mail Policy (<http://www.colorado.edu/policies/student-e-mail-policy>) webpage, call the IT Service Center at 303-735-HELP or email HELP@colorado.edu. To learn more about student email accounts, visit the Office of Information Technology's Messaging and Collaboration (<http://www.colorado.edu/oit/services/messaging-collaboration>) webpage.

Copyright & Fair Use

The University of Colorado Boulder community respects the intellectual property of others, regardless of the medium by which it is transmitted. This is a cornerstone of academic integrity. We prohibit the use of unauthorized distribution of copyrighted material, which is subject to both civil and criminal penalties as well as university procedures.

Distributing copyrighted materials using peer-to-peer or file-sharing programs is illegal and the university uses technological solutions to deter this activity. Still, the university regularly receives notices of copyright violations and is required by law to take action. Common consequences include loss of network access and referral to the Office of Judicial Affairs. Guidance on campus fair use and copyright issues is provided on the University Libraries (<http://www.colorado.edu/libraries/copyright-information>) website.

Diversity & Nondiscrimination

Nondiscrimination Statement

The University of Colorado Boulder does not discriminate on the basis of race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy in admission and access to, and treatment and employment in, its educational programs and activities. The university takes affirmative action to increase ethnic, cultural, and gender diversity; to employ qualified disabled individuals; and to provide equal opportunity to all students and employees.

Commitment to Diversity

The Division of Student Affairs supports and contributes to creating and sustaining a diverse, multicultural, socially just and inclusive campus climate by learning about, recognizing and honoring the diverse backgrounds, histories, identities and life experiences of all our students, faculty and staff. Our goal is to create an environment in which all campus community members can thrive while feeling welcomed, safe and at home.

"At the University of Colorado Boulder we are committed to building a campus community in which diversity is a fundamental value. People are different and the differences among us are what we call diversity—a natural and enriching hallmark of life. Diversity includes, but is not

limited to, ethnicity, race, gender, age, class, sexual orientation, religion, disability, veteran status, gender identity/expression, veteran status, political affiliation or political philosophy and health status. A climate of healthy diversity is one in which people value individual and group differences, respect the perspectives of others and communicate openly."

"Diversity is a key to inclusive excellence in education. A diverse learning environment better prepares all students for the world that awaits them. CU Boulder is committed to enriching the lives of our students, faculty and staff by providing a diverse campus where the exchange of ideas, knowledge and perspectives is an active part of learning."—from the *Guidelines for Diversity Planning*

Institutional Equity and Compliance, Office of

The University of Colorado Boulder is committed to maintaining a positive learning, working and living environment and does not discriminate on the basis of race, color, national origin, pregnancy, sex, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. The Office of Institutional Equity and Compliance investigates all claims alleging sexual misconduct, harassment and/or discrimination, or related retaliation by students, staff or faculty pursuant to the University of Colorado Sexual Misconduct Policy, the University of Colorado Boulder Policy on Discrimination and Harassment, and the University of Colorado Policy on Amorous Relationships. Investigations are conducted by neutral fact-finders who treat all parties involved with respect and dignity and refer them to appropriate support services as needed. The University is committed to taking appropriate action against those who violate these policies.

The Office of Institutional Equity and Compliance also provides directly, or assists with the coordination of, educational workshops and trainings for all members of our community designed to promote an inclusive environment and to prevent acts of discrimination, harassment or sexual misconduct.

For more information or copies of the policies and procedures, or to report an allegation of sexual misconduct or protected class discrimination or harassment, please visit the Office of Institutional Equity and Compliance (<http://www.colorado.edu/institutionalequity>) website or call 303-492-2127.

Faculty

A

Aaholm, Philip
Professor Emeritus: Music

Aaronson, Norman F.
Professor Emeritus: School of Law

Abbott, Lois A.
Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Abbott, Lon D (https://experts.colorado.edu/display/fisid_145044)
Senior Instructor: Geological Sciences; Faculty Director: International Education

Abdalati, Waleed (https://experts.colorado.edu/display/fisid_145800)
Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Professor: Geography
PhD, University of Colorado Boulder

Ablowitz, Mark J (https://experts.colorado.edu/display/fisid_100691)
Professor: Applied Mathematics
PhD, Massachusetts Institute of Technology

Acevedo-Munoz, Ernesto R (https://experts.colorado.edu/display/fisid_113061)
Professor: Film Studies
PhD, University of Iowa

Ackerman, John Martin (https://experts.colorado.edu/display/fisid_144951)
Associate Professor, Assoc Faculty Director: Program for Writing and Rhetoric; Associate Professor: Communication
PhD, Carnegie Mellon University

Ackland, Len
Professor Emeritus: Journalism

Adams, Heather L (https://experts.colorado.edu/display/fisid_143714)
Instructor: Leeds School of Business
PhD, University of Maryland College Park Campus

Adams, William (https://experts.colorado.edu/display/fisid_103612)
Professor: Ecology and Evolutionary Biology
PhD, Australian National Univ (Australia)

Adil, Sabahat Fatima (https://experts.colorado.edu/display/fisid_155862)
Assistant Professor: Asian Languages and Civilizations
PhD, University of Chicago

Adler, Edward Scott (https://experts.colorado.edu/display/fisid_108903)
Professor: Political Science; Faculty Director: Center to Advance Research and Teaching in the Social Sciences (CARTSS)
PhD, Columbia University In the City of New York

Adler, Patricia A.
Professor Emeritus: Sociology
PhD, University of California, San Diego

Afridi, Khurram (https://experts.colorado.edu/display/fisid_153814)
Assistant Professor: Electrical, Computer and Energy Engineering (ECEE)
PhD, Massachusetts Institute of Technology

Ahmed, Alaa Abdalla (https://experts.colorado.edu/display/fisid_144736)
Associate Professor: Integrative Physiology; Associate Professor: Mechanical Engineering
PhD, University of Michigan Ann Arbor

Ahmed, Nisar Razzi (https://experts.colorado.edu/display/fisid_153237)
Assistant Professor: Aerospace Engineering Sciences; Assistant Professor: Research & Engineering Ctr for Unmanned Vehicles (RECUV)
PhD, Cornell University

Ahn, Natalie (https://experts.colorado.edu/display/fisid_106044)
Professor: Chemistry and Biochemistry
PhD, University of California-Berkeley

Aiken, Ellen (https://experts.colorado.edu/display/fisid_103974)
Instructor: Sewall RAP
PhD, University of Colorado Boulder

- Akos, Dennis M. (https://experts.colorado.edu/display/fisid_131119)
Associate Professor: Aerospace Engineering Sciences; Associate Professor: Electrical, Computer and Energy Engineering (ECEE)
PhD, Ohio University
- Albert, Michelle A. (https://experts.colorado.edu/display/fisid_134708)
Senior Instructor: Program for Writing and Rhetoric
MFA, Naropa Institute
- Aldama, Arturo James (https://experts.colorado.edu/display/fisid_130739)
Associate Professor, Assoc Chair: Ethnic Studies
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Vossen, Thomas Wilhelmus (https://experts.colorado.edu/display/fisid_126642)
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PhD, University of Maryland College Park Campus

Vrieze, Scott Ian (https://experts.colorado.edu/display/fisid_153059)
Assistant Professor: Psychology and Neuroscience; Assistant Professor: Institute for Behavioral Genetics (IBG)
PhD, University of Minnesota Central office

W

Wachtel, Howard
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Waddell, Jay L (https://experts.colorado.edu/display/fisid_151520)
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MS, University of Wisconsin-Madison

Wadsworth, Thomas Pearson (https://experts.colorado.edu/display/fisid_144382)
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Professor: Psychology and Neuroscience; Professor: Institute of Cognitive Science (ICS)
PhD, University of Michigan Ann Arbor

Wagner, Kelvin (https://experts.colorado.edu/display/fisid_105344)
Professor: Electrical, Computer and Energy Engineering (ECEE)
PhD, California Institute of Technology

Wagner, Stephen R (https://experts.colorado.edu/display/fisid_139773)
Professor Attendant Rank, Lecturer: Physics

Wahr, John M.
Professor Emeritus: Physics

Waite, William M.
Professor Emeritus: Computer Science; Professor Emeritus: Electrical, Computer and Energy Engineering (ECEE)

Walba, David M (https://experts.colorado.edu/display/fisid_105830)
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Walden, Glenda D (https://experts.colorado.edu/display/fisid_105898)
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Walker, Deward
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Walker, Deward E. Jr
Professor Emeritus: Anthropology

Walker, Melanie (https://experts.colorado.edu/display/fisid_101750)
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MFA, Florida State University

Walker, Michael Edward (https://experts.colorado.edu/display/fisid_155103)
Instructor: Environmental Engineering Program (EVEN)
PhD, Illinois Institute of Technology

Walker, Theodore R.
Professor Emeritus: Geological Sciences

Walter, Douglas W (https://experts.colorado.edu/display/fisid_101811)
Professor: Music
DMA, Temple University

Walter, Martin E (https://experts.colorado.edu/display/fisid_105263)
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PhD, University of California-Irvine

Walther, Geraldine E (https://experts.colorado.edu/display/fisid_142000)
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Wanderer, Jules J.
Professor Emeritus: Sociology

Wang, Xiang (https://experts.colorado.edu/display/fisid_145812)
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PhD, Boston University

Wang, Yanwen (https://experts.colorado.edu/display/fisid_154266)
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PhD, Emory University

Ward, Wayne Hinson (https://experts.colorado.edu/display/fisid_114680)
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Waters, Brian Todd (https://experts.colorado.edu/display/fisid_155846)
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PhD, University of California-Los Angeles

Waters, Keith John (https://experts.colorado.edu/display/fisid_107518)
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Watkins, Alexander Charlton (https://experts.colorado.edu/display/fisid_151514)

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MLS, Pratt Institute

Watkins, Linda R (https://experts.colorado.edu/display/fisid_101513)

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PhD, Virginia Commonwealth University

Weatherley, Donald A.

Professor Emeritus: Psychology and Neuroscience

Webb, David C. (https://experts.colorado.edu/display/fisid_141204)

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PhD, University of Wisconsin-Madison

Weber, Beverly Marie (https://experts.colorado.edu/display/fisid_144523)

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PhD, University of Massachusetts at Amherst

Weber, Jorg Mathias (https://experts.colorado.edu/display/fisid_142930)

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PhD, Univ of Kaiserslautern (Germany)

Weers, Walter A.

Professor Emeritus: Civil, Environmental and Architectural Engineering

Wehner, Jeanne M.

Professor Emeritus: Psychology and Neuroscience

Wehr, Paul E.

Professor Emeritus: Sociology

Wei, William (https://experts.colorado.edu/display/fisid_100864)

Professor: History
PhD, University of Michigan Ann Arbor

Weidman, Patrick D.

Professor Emeritus: Mechanical Engineering

Weimer, Alan W (https://experts.colorado.edu/display/fisid_109152)

Professor: Chemical and Biological Engineering; Faculty Director: College of Engineering and Applied Science
PhD, University of Colorado Boulder

Weimer, Paul (https://experts.colorado.edu/display/fisid_104630)

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PhD, University of Texas at Austin

Weiser, Philip J (https://experts.colorado.edu/display/fisid_114575)

Professor, Faculty Director: School of Law
JD, New York University

Weiss, Debra R (https://experts.colorado.edu/display/fisid_155205)

Senior Instructor, Faculty Director: University Libraries
MLS, University of North Carolina Chapel Hill

Weiss, Jeffrey B (https://experts.colorado.edu/display/fisid_102145)

Associate Professor: Atmospheric and Oceanic Sciences (ATOC)
PhD, University of California-Berkeley

Weiss, Rita S.

Professor Emeritus: Speech, Language and Hearing Sciences (SLHS)

Welner, Kevin G (https://experts.colorado.edu/display/fisid_115565)

Professor: School of Education
PhD, University of California-Los Angeles

Welsh, Megan Elizabeth (https://experts.colorado.edu/display/fisid_153633)

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MLIS, University of Denver

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MA, Miami University Oxford Campus

Wertheimer, Michael

Professor Emeritus: Psychology and Neuroscience

Wessman, Carol A (https://experts.colorado.edu/display/fisid_100909)

Professor: Cooperative Institute for Research in Environmental Sciences (CIRES); Faculty Director: Environmental Studies Program; Professor: Ecology and Evolutionary Biology
PhD, University of Wisconsin-Madison

Weston, Timothy B (https://experts.colorado.edu/display/fisid_107605)

Associate Professor: History
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Wetherbee, Charles Tyler (https://experts.colorado.edu/display/fisid_151515)

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BM, Curtis Institute of Music

Whisman, Mark (https://experts.colorado.edu/display/fisid_113391)

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White, Cindy Hagemeyer (https://experts.colorado.edu/display/fisid_107461)

Associate Professor: Communication; Associate Dean: College of Media, Communication & Information
PhD, University of Arizona

White, Eric C (https://experts.colorado.edu/display/fisid_101917)

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White, James (https://experts.colorado.edu/display/fisid_102726)

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Whitehead, Deborah Faith (https://experts.colorado.edu/display/fisid_144239)

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William, Kaspar J.
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Williams, Lawrence Edwin (https://experts.colorado.edu/display/fisid_145743)
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 PhD, Yale University

Williams, Letitia S.
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Williams, Mark W (https://experts.colorado.edu/display/fisid_105438)
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 Geography
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Willis, Erin N (https://experts.colorado.edu/display/fisid_156068)
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 Design
 PhD, University of Missouri-Systems office

Willis, John Matthew (https://experts.colorado.edu/display/fisid_140095)
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Willis, Michael Jared (https://experts.colorado.edu/display/fisid_152040)
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 MBA, Brigham Young University

Willmann, Kent D (https://experts.colorado.edu/display/fisid_148075)
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Wilson, John B.
 Professor Emeritus: Art and Art History

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Wise, Jonathan S (https://experts.colorado.edu/display/fisid_151516)
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Wobbekind, Richard (https://experts.colorado.edu/display/fisid_100997)
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Wolzien, Charles
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Professor Emeritus: Molecular, Cellular & Developmental Biology (MCDB)

Woodman, Elizabeth A.
Professor Emeritus: Art and Art History

Woodman, George E.
Professor Emeritus: Art and Art History

Wrenn, John H.
Professor Emeritus: English

Wright, Constance
Professor Emeritus: English

Wright, Kenneth P (https://experts.colorado.edu/display/fisid_125586)
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Xiao, Jianliang (https://experts.colorado.edu/display/fisid_149777)
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PhD, Northwestern University

Xu, Ping (https://experts.colorado.edu/display/fisid_101140)
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Xue, Ding (https://experts.colorado.edu/display/fisid_112336)
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Y

Yaeger, Barbara Jean (https://experts.colorado.edu/display/fisid_151792)
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Yamashita, Masano (https://experts.colorado.edu/display/fisid_147343)
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Yang, Ronggui (https://experts.colorado.edu/display/fisid_142640)
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Yeh, Emily Ting (https://experts.colorado.edu/display/fisid_130119)
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Yeh, Pei Hsiu (https://experts.colorado.edu/display/fisid_151584)
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Yin, Hang Hubert (https://experts.colorado.edu/display/fisid_144763)
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Yin, Xiaobo (https://experts.colorado.edu/display/fisid_153484)
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Young, Gregory D (https://experts.colorado.edu/display/fisid_143374)
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Young, Phoebe S. K. (https://experts.colorado.edu/display/fisid_147429)
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Young, Wendy Mores (https://experts.colorado.edu/display/fisid_146942)
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Youngquist, Paul Bruce (https://experts.colorado.edu/display/fisid_147514)
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Zaharatos, Brian R (https://experts.colorado.edu/display/fisid_156225)
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Zane, Regan A (https://experts.colorado.edu/display/fisid_109504)
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Zarske, Malinda Schaefer (https://experts.colorado.edu/display/fisid_120823)
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Zax, Jeffrey S (https://experts.colorado.edu/display/fisid_100898)
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Zechman, Sarah Louise Center (https://experts.colorado.edu/display/fisid_156016)
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Zeiler, Thomas W (https://experts.colorado.edu/display/fisid_101692)
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Zemka, Sue (https://experts.colorado.edu/display/fisid_103078)
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Zender, Jaime (https://experts.colorado.edu/display/fisid_122563)
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Zhai, Zhiqiang (https://experts.colorado.edu/display/fisid_130604)
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Zhang, Dan (https://experts.colorado.edu/display/fisid_149619)
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Zhang, Shuang (https://experts.colorado.edu/display/fisid_151517)
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Zhang, Wei (https://experts.colorado.edu/display/fisid_146429)
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Zhong, Shijie (https://experts.colorado.edu/display/fisid_118396)
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PhD, University of Colorado Denver

Zimmerman, Eric (https://experts.colorado.edu/display/fisid_122809)
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PhD, University of Chicago

Zimmerman, Michael
Professor Emeritus: Philosophy
PhD, Tulane University

Zizzi, Michael P. (https://experts.colorado.edu/display/fisid_143861)
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Znidarcic, Dobroslav (https://experts.colorado.edu/display/fisid_104109)
Professor: Civil, Environmental and Architectural Engineering
PhD, University of Colorado Boulder

Zunger, Alexander (https://experts.colorado.edu/display/fisid_149868)
Research Professor: Renewable & Sustainable Energy Institute (RASEI)
PhD, Tel Aviv Univ (Israel)

UNDERGRADUATE CATALOG

The Office of the Vice Provost for Undergraduate Education is charged with overseeing the entire undergraduate student experience, including assessing outcomes and launching and supporting student-facing campus initiatives. The Office of Undergraduate Education develops and oversees first-year seminars and first-year interest groups; coordinates undergraduate academic policy; coordinates the campus advising structure; and is responsible for the coordination and assessment of campus retention and persistence initiatives.

The vice provost for undergraduate education oversees a variety of programs and offices that aren't affiliated with any single college but that serve all students across campus, including Air Force, Army and Naval ROTC; the Office of International Education; the presidents leadership class; special undergraduate enrichment programs, including the Boettcher and Norlin Scholars and the undergraduate research opportunities program; and the Student Academic Success Center.

Academic policies governing undergraduate education are initiated by the faculty in accordance with the laws of the Board of Regents. The Boulder Faculty Assembly is the largest of the faculty governance organizations and it interfaces with additional faculty governance groups in the colleges through a series of liaison relationships. Several advisory bodies are in place for the vice provost for undergraduate education, comprised of students, faculty and administrators. The Office of Undergraduate Education works closely with the offices of the vice chancellor for student affairs and the associate vice chancellor for enrollment management. The vice provost for undergraduate education reports to the provost.

Admissions

The Office of Admissions welcomes inquiries from prospective students regarding undergraduate admission. Through the admission process, the university seeks to identify applicants who will successfully complete a collegiate academic program. Admission is based on many criteria, including high school GPA or GED test scores, high school rank, the quality of course work, college entrance test scores, personal essays and the extent to which the minimum academic preparation standards (MAPS) (p. 113) have been met.

For additional undergraduate admission information, visit the Admissions (<http://www.colorado.edu/admissions>) webpage.

Visiting the Campus

Prospective students and their families are welcome to visit the Office of Admissions in Regent Administrative Center, room 125, between 9 a.m. and 5 p.m. (summer hours are 8:30 a.m. to 4:30 p.m.), Monday through Friday, except on holidays. Daily information sessions, walking tours of the campus and special all-day visit programs are offered. Although interviews are not used in the decision-making process, you are invited to visit the campus.

The best time to see the campus is when classes are in session (September through mid-December and mid-January to early May, with the exception of spring break); see the academic calendar (p. 13) for specific dates. There are dates when information sessions, campus tours and visit programs are not held due to holidays or university closures. It is important to check our website for the most current information.

Reservations

Reservations are required for all information sessions, tours and visit programs and can be made through your MyCUBoulder (<http://mycuboulder.colorado.edu>) account. For complete visit program descriptions, dates, reservation forms and campus maps, visit the Admission Visit Programs (<http://www.colorado.edu/visit/admissions>) webpage. Visit program dates for future academic years are added to the website as they become available (usually in August each year).

Daily Information Sessions and Campus Tours

Information sessions with an admission counselor are held Monday through Friday at 9:30 a.m. and 1:30 p.m. Following the information sessions are walking tours of the campus led by student guides, beginning at 10:30 a.m. and 2:30 p.m. Combined information sessions and tours are also held at 10:30 a.m. most Saturdays.

Campus Visit Programs

An excellent way to become acquainted with the campus is to participate in one of the campus visit programs specially designed for prospective students and parents.

These programs are offered throughout the year and provide prospective students and their families the chance to participate in information sessions, take a campus tour, learn more about residence hall life, talk with student and parent panels and meet with campus representatives, as well as attend classes or listen to a sample lecture. For more information about any or all of these visit programs or instructions on how to register, go to the Admission Visit Programs (<http://www.colorado.edu/visit/admissions>) webpage or call the Office of Admissions.

General Admission Information

Choosing a Program of Study

When applying for admission, students need to choose a major in one of CU Boulder's colleges or schools. Applicants who have not decided on a major can select an "open option" major. This allows students to explore different options during their first year of study. After this time, they will decide on a specific major for their remaining years. Students can also change their area of study, but this can result in additional course requirements that may add to the number of semesters necessary to complete a degree.

Although applicants can apply to only one CU Boulder college or school, after enrollment they can apply for transfer to another Boulder college or school through the intrauniversity transfer (IUT) process. Criteria for transferring from one college or school to another are competitive, and each college or school establishes its own standards.

Double Degrees, Double Majors, Minors and Certificate Programs

There are several programs that allow students to include additional areas of academic concentration beyond their chosen major. Two different degrees, either from the same college or school, or degrees from different colleges or schools, may be earned, providing certain conditions are met. Students are admitted to one major and degree program initially but may pursue a second degree as early as their first semester of

enrollment. Minor programs are offered in a number of undergraduate departments and programs in the College of Arts and Sciences, the Leeds School of Business, the College of Engineering and Applied Science and the School of Education. Certificate programs in arts and sciences, business, engineering and music fields are also available.

Preprofessional Study

Preprofessional advisors are available to help students interested in medicine, dentistry, physical therapy, veterinary medicine, nursing, pharmacy, physician assistant and other health professions or law. Students interested in these fields may apply to any of the majors open to new undergraduates, including the open option major in the College of Arts and Sciences. Students interested in one of the undergraduate or graduate health sciences programs offered at the University of Colorado Anschutz Medical Campus may complete preprofessional work on the Boulder campus. Admission is competitive, but preference to all health sciences programs is given to Colorado residents.

For more information, see the Preprofessional Programs (p. 852) section or visit the Pre-Health (<http://www.colorado.edu/advising/pre-health>) webpage.

Music Applicants

Prospective music majors must submit both an undergraduate application for admission to the Office of Admissions, and a College of Music supplemental application.

All music applicants are initially considered for admission to the College of Arts and Sciences Open Option major. Admission to a College of Music degree program (Bachelor of Arts in Music, Bachelor of Music Education, Bachelor of Music) is determined after the music audition and application evaluation process has been completed. Students who are admitted to the College of Arts and Sciences but not the College of Music will be able to keep their place in the College of Arts and Sciences.

Live auditions, which are preferred unless travel distance is prohibitive, are scheduled for selected Saturdays in January and February. Other live audition times may be arranged; high quality recordings also may be submitted in lieu of a live audition.

College of Music scholarships are awarded to music majors only. High school and college transfer students are automatically considered for merit-based music scholarships upon completion of the application process, including the audition. Transfer students who are receiving a music scholarship from their current institution must submit a scholarship release form before they can be awarded a music scholarship.

To access the College of Music Supplemental Application Form, as well as more detailed information about audition requirements, faculty and degree programs, visit the college's Admissions (<http://www.colorado.edu/music/admissions>) webpage.

Teacher Education Applicants

The School of Education offers multiple pathways for teacher candidates interested in transformative careers in education.

Undergraduate students interested in K–6 Elementary Education may either pursue the bachelor's degree in elementary education (new for fall 2017) or complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. Students interested in K–12 Music Education complete the teacher licensure requirements

while earning a Music Education degree from the College of Music. Students interested in Secondary (7–12) teacher education will complete the teacher licensure requirements while earning a bachelor's degree in a corresponding field. CU Boulder offers Secondary programs in English, Mathematics, Science, Social Studies and the following foreign languages: French, German, Japanese, Latin, Russian and Spanish.

Students interested in an undergraduate degree combined with teaching licensure must apply to the other CU Boulder undergraduate degree program and then submit their application and credentials to the School of Education. Undergraduate students who plan to pursue teacher education should declare this intent to the school's Office of Student Services as soon as possible after enrolling at CU Boulder.

Teacher education applicants who have previously completed a four-year undergraduate degree program must submit their application to the Office of Admissions.

Refer to the School of Education section for more information about teacher education. For application and deadline information, interested students may also visit the School of Education (<http://www.colorado.edu/education>) website, email EdAdvise@colorado.edu or call 303-492-6555.

College Readiness in English and Mathematics

The state of Colorado mandates that all undergraduate students entering public institutions of higher education in Colorado be screened for college readiness in reading, writing and mathematics. To pass the screening requirements, students must present minimum test scores.

Students who have successfully completed four years each of college preparatory English and college preparatory math courses are deemed to have met the respective requirements regardless of the test score.

Students who do not meet CU Boulder's criteria for college readiness will be required to demonstrate readiness through an additional examination or to enroll in preparatory courses prior to completing the first 30 credit hours of course work on the Boulder campus. Students who have not demonstrated reading, writing and/or mathematics readiness will receive additional details after they confirm their intent to enroll at CU Boulder.

Admission Requirements

Students are freshman applicants if they are currently enrolled in high school, or if they have earned a high school diploma or its equivalent and have not enrolled in a college or university since graduation.

Admission Criteria

Many factors are considered in evaluating students' applications for admission to CU Boulder. Although academic performance in high school (high school GPA and the quality of course work) is the most important indicator of success, other factors are also considered. These include students' college entrance test scores (either the SAT or ACT), the trend in their grades, the extent to which the minimum academic preparation standards (MAPS) are met, their personal essays and the potential contributions they may make to the campus community. For information on MAPS, see MAPS table (p. 113) in this section.

Applicants whose records reflect nontraditional grading systems, unusual curricula or high school equivalency through the GED test will receive individual consideration.

College Entrance Tests

CU Boulder requires either the SAT or the ACT for admission consideration. We do not require the ACT Writing Test or the SAT Essay for CU Boulder admission consideration. The highest scores are used in the admission decision. If the same test is taken more than once, the scores are combined on each subsection to give the highest overall score. SAT subject test scores are not required. CU Boulder requires all visa holders graduating from a US high school to submit either an SAT or ACT score. We encourage all students to submit an SAT or ACT score to receive consideration or our automatic consideration merit scholarships. For more information, see the How to Apply for Undergraduate Admission section.

Minimum Academic Preparation Standards (MAPS)

Students who graduated from high school in 1988 or later are expected to have completed courses that meet certain minimum academic preparation standards (MAPS) before enrolling at CU Boulder. Students who attended a non-U.S. high school for two years or more are not subject to MAPS. Any MAPS deficiency will be considered during the admission review process. The MAPS for specific CU Boulder colleges and schools are listed in this section.

Students may be admitted to CU Boulder even though they have not met all the MAPS requirements. If that is the case, they are required to complete the appropriate MAPS courses once enrolled, and the credit hours may be applied toward graduation. *All MAPS deficiencies must be completed prior to graduation from CU Boulder.* Students may also complete missing MAPS course work at other colleges or universities, through approved credit-by-examination programs or by testing out through the appropriate foreign language department.

Policies Concerning MAPS Deficiencies

The policies of the Boulder campus with respect to completing MAPS course work after enrollment are as follows.

1. Appropriate missing MAPS course work is generally included in the credit hours for graduation.
2. All course work toward fulfillment of the MAPS must be taken for a letter grade.
3. It is strongly recommended that students enroll in and complete at least one MAPS course each term, beginning in the first term of enrollment, until such time as all MAPS are completed. This policy applies to new freshmen, transfer students and students transferring from other academic units on the Boulder campus and from other campuses of the university. Some colleges or schools may impose a sanction if the student does not complete one course per semester toward meeting MAPS deficiencies.
4. All students who first enroll in one academic unit at CU Boulder and subsequently transfer to another unit are required to meet the MAPS specified for the new unit, irrespective of their completion of MAPS units in their previous college or school.
5. Students in double-degree programs must meet MAPS requirements of both degree-granting units.

6. Students must consult with a CU Boulder academic advisor (or read their college or school's academic publications) to determine which specific courses may be used to meet a MAPS requirement (p. 113).

Advanced Placement

CU Boulder participates in the Advanced Placement program of the College Board. More than one-third of Boulder's entering freshmen submit Advanced Placement (AP) test scores each year. Official scores must be sent to the admissions office directly from the College Board for both first-year students and transfer students. For a guide to specific equivalencies, see the Advanced Placement (AP) Credit Table (p. 106).

For more information, write or call:

AP Exams

P.O. Box 6671

Princeton, NJ 08541-6671

609-771-7300 or toll free 888-225-5427

aphighered.collegeboard.org (<http://aphighered.collegeboard.org>)

International Baccalaureate

The International Baccalaureate (IB) Diploma programs provide preuniversity study. IB examinations, whether leading to a full IB diploma or to an IB certificate often qualify students for advanced standing at CU Boulder. In general, credit hours are granted for approved IB examinations at the higher level with a score of 4 or better.

Students admitted to the University of Colorado Boulder who have graduated from high school having successfully completed an International Baccalaureate Diploma program shall be granted 24 hours of college credit. Students should check with their college or school to determine if or how the earned college credit hours apply toward degree requirements. No CU Boulder tuition shall be charged for these credit hours. These credit hours shall be granted, however, only if the student receives a score of 4 or better on an examination administered as part of the IB Diploma program. If the student scores less than 4 on any IB subject test, the credit hours granted shall be reduced accordingly.

An official copy of the diploma with test scores must be sent to the admissions office directly from the IB organization. For a guide to specific equivalencies, see International Baccalaureate (IB) Credit Table (p. 107). For the most current information on how CU Boulder evaluates IB credit hours, visit colorado.edu/admissions/selection/credit (<http://colorado.edu/admissions/selection/credit>).

For more information on test administration, write or call:

International Baccalaureate Organization

475 Riverside Drive

16th floor

New York, NY 10115

212-696-4464

www.ibo.org (<http://www.ibo.org>)

Freshman Applicants Not Granted Admission

Students who are not granted admission as entering freshmen may consider transferring to CU Boulder after successful study elsewhere. Students are encouraged to complete at least one full year of transferable college or university course work, including any courses outlined in the

minimum academic preparation standards (MAPS) chart that were not met in high school.

Applicants are considered transfer students if they enrolled in any college-level course work (at another college or university, or other campus of the University of Colorado), full time or part time, since graduating from high school. Applicants are not considered transfer students if the only college-level classes they have taken were while enrolled in high school. To be considered for admission, transfer students must report all previous college work and have a high school diploma or its equivalent.

Competitive Admission Criteria

Transfer applicants are considered for admission on the basis of transfer as well as freshman criteria, including minimum academic preparation standards (MAPS). All transfer applicants who graduated from high school in 1988 or later are expected to have completed MAPS requirements before enrolling at CU Boulder.

CU Boulder's aim is to offer highly qualified and intellectually curious transfer students the opportunity to continue pursuing their educational goals. We practice a holistic admission review process, taking into account a variety of primary academic and secondary factors as they relate to your projected success in our competitive academic environment. You will be considered on an individual basis relative to a prediction of your academic success in the college to which you apply. For more information on competitive transfer admission guidelines, visit www.colorado.edu/admissions/transfer (<http://www.colorado.edu/admissions/transfer>).

College of Arts and Sciences

A cumulative college GPA of 2.50 or better in appropriate general education courses is required. Students who complete 30 credit hours of transfer-level work with a cumulative GPA of 2.70 at a Colorado community college and who apply by the equal consideration deadline are assured admission to the College of Arts and Sciences. Students must complete all of the Minimum Academic Preparation Standards (MAPS) to be guaranteed admission.

NOTE: This information applies to students who entered college after spring 1988. For those students who entered college prior to summer 1988, contact the Office of Admissions.

Leeds School of Business

A cumulative college GPA of 3.00 or higher is required. Preference is given to students who have completed microeconomics and macroeconomics and either statistics (business statistics strongly preferred) or calculus with competitive letter grades.

School of Education

The School of Education offers multiple pathways for teacher candidates interested in transformative careers in education.

Undergraduate students interested in K–6 Elementary Education may either pursue the bachelor's degree in elementary education (new for fall 2017) or complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. Students interested in K–12 Music Education complete the teacher licensure requirements while earning a Music Education degree from the College of Music. Students interested in Secondary (7–12) teacher education will complete the teacher licensure requirements while earning a bachelor's degree in a corresponding field. CU Boulder offers Secondary programs in

English, Mathematics, Science, Social Studies and the following foreign languages: French, German, Japanese, Latin, Russian and Spanish.

Students interested in an undergraduate degree combined with teaching licensure must apply to the other CU Boulder undergraduate degree program and then submit their application and credentials to the School of Education. Undergraduate students who plan to pursue teacher education should declare this intent to the school's Office of Student Services as soon as possible after enrolling at CU Boulder.

Teacher education applicants who have previously completed a four-year undergraduate degree program must submit their application to the Office of Admissions.

Refer to the School of Education (p. 573) section for more information about teacher education. Interested students may also visit the School of Education (<http://www.colorado.edu/education>) website.

Program in Environmental Design

A college GPA of 2.75 or higher is required. Admission preference is given to students who have taken college-level courses in the areas of architecture, planning or environmental studies. Completion of courses in related fields of social science, natural science, fine arts or humanities is also considered in the admission review.

College of Engineering and Applied Science

Cumulative college GPA of 3.00 for all majors EXCEPT Mechanical Engineering, which requires a 3.30 cumulative college GPA. Transfer applicants must have taken courses relevant to an engineering curriculum, including at least two semesters of college-level calculus, along with two semesters of calculus-based physics with lab and/or college-level chemistry with lab. Chemical engineering and chemical and biological engineering applicants should have completed two semesters of college chemistry.

Grades in math, science and engineering courses should be B or higher EXCEPT Mechanical Engineering which requires a B+ or higher. (Exception: Students [resident or non-resident] who apply for admission for a semester that occurs within 18 months of their high school graduation date may also be competitive without having taken the above coursework, as long as the high school academic record meets selected minimum criteria. In addition, if any college-level work has been completed, the overall GPA should be 3.00 or higher.)

The college guarantees admission to any of its baccalaureate degree programs to students transferring from Colorado public institutions of higher education who meet the College of Engineering and Applied Science Guaranteed Admission Criteria for Colorado Transfers (<http://www.colorado.edu/admissions/transfer>).

College of Media, Communication and Information

Admission to the College of Media, Communication and Information requires a transfer student to have a minimum of 24 semester hours of appropriate college-level course work completed or in progress and an overall GPA of 3.00 as well as a 3.00 average GPA in CMCI prerequisites. Applicants must have completed or be in progress in the equivalent of the two introductory courses for the following majors:

- Communication: Public Speaking OR Group Interaction
- Information Science: Intro to Computer Science OR Intro to Programming
- Journalism: Fundamentals of Reporting OR New Media/Internet Media

- Media Production: Intro to Film
- Media Studies: Intro to Mass Media
- Strategic Communication: Principles of Advertising OR an equivalent Principles of Public Relations

College of Music

A college GPA of 2.75 or higher and an audition of all applicants is required. More information may be found at www.colorado.edu/music/admissions/undergraduate-transfers (<http://www.colorado.edu/music/admissions/undergraduate-transfers>).

College Entrance Tests

Transfer students are required to submit SAT or ACT scores, except those who have completed 24 or more semester hours of transferable college-level work at the time they apply.

Students' highest scores are used in the admission decision. If the same test is taken more than once, the scores on each subsection are combined to give the highest overall score. SAT subject test scores are not required. For more information, visit www.colorado.edu/admissions/selection (<http://www.colorado.edu/admissions/selection>).

Minimum Academic Preparation Standards (MAPS)

Effective for students who graduated from high school in spring 1988 or later, CU Boulder expects all transfer students to have completed courses that meet certain minimum academic preparation standards (MAPS). For MAPS requirements for specific CU Boulder colleges and schools, see the MAPS chart (p. 113).

MAPS requirements not met in high school may be met through equivalent college-level course work before or after transfer to CU Boulder. A semester course completed at the college level substitutes for a year of work in high school. Students who attended a non-U.S. high school for two years or more are not subject to MAPS.

The university invites applications from qualified international students. International applicants are those who already have, or will be applying for, a temporary U.S. visa such as F-1 and J-1. Applicants who are United States citizens, permanent residents, asylees or refugees are not considered international. These students should follow application and admission procedures for undergraduates or graduates as described elsewhere in this catalog.

More than 3,000 international students from more than 100 countries study at CU Boulder. Applications for admission are processed by the Office of Admissions. International students who wish to pursue a full-time program of study at the undergraduate or graduate level should go to the international student website at www.colorado.edu/admissions/apply (<http://www.colorado.edu/admissions/apply>) for admission information and online application forms.

Assistance after admission is provided by International Student and Scholar Services, located in the Office of International Education (www.colorado.edu/oie/iss) (<http://www.colorado.edu/oie/iss>). Boulder offers a full range of services to international students, including a host family program, orientation, special programs and activities for international students and personal attention to individual needs. For information, visit [www.colorado.edu/oie/international-student-and-](http://www.colorado.edu/oie/international-student-and-scholar-services/student-resources)

[scholar-services/student-resources](http://www.colorado.edu/oie/international-student-and-scholar-services/student-resources) (<http://www.colorado.edu/oie/international-student-and-scholar-services/student-resources>).

Intensive English language instruction is also offered by the International English Center. For information, visit <http://iec.colorado.edu>, email ieccu@colorado.edu or call 303-492-5547.

Prospective graduate students should visit www.colorado.edu/admissions/graduate (<http://www.colorado.edu/admissions/graduate>) for information and application forms specific to the academic department in which they are interested. Prospective graduate students can also call the campus telephone operator at 303-492-1411 and ask to have the call transferred to the department of interest or write to the specific department, University of Colorado Boulder, Boulder, CO 80309.

International Nondegree Students

The University of Colorado Boulder welcomes nondegree visiting international students from around the world. International students who are requesting a form I-20 (for an F-1 visa) are required to enroll full-time (6 credit hours in summer and 12 credit hours in fall and spring semesters). In order to maintain F-1 status, international students should not drop below full-time enrollment. Students on B-1/B-2 visas may be eligible to take one course. Visiting international students must meet academic prerequisites in order to enroll. Visiting international students who are not native speakers of English must also demonstrate English language proficiency by submitting valid TOEFL or IELTS scores, or by submitting proof that they completed at least one year of full-time academic study at a U.S. college or university or at an institution in a country where English is the native language (i.e., Australia, Canada).

Email ceadvise@colorado.edu (ceadvisor@colorado.edu) for additional information.

Readmit Students

CU Boulder undergraduate degree-seeking students who have not attended the Boulder campus for three semesters (including summer) since their last graded semester must submit the undergraduate Application for Readmission to the Office of Admissions. No application fee is required. Students who have attended any other college or university since attending CU Boulder must submit official transcripts directly from the issuing institution(s) to the Office of Admissions.

Students seeking readmission into a different college or school than that in which they were previously enrolled must note the requested change on their application. Otherwise, the university assumes that students will return to the same field of study, if eligible to do so. Students who request a change in college or school for which they are not eligible must request reconsideration for their previous program.

Former students in the College of Arts and Sciences wishing to return to the college must apply to their previous major. Students who wish to pursue a second undergraduate degree must apply to a major different from the one in which they received their degree. Students may not apply for a second bachelor's degree in the Leeds School of Business or the College of Media, Communication and Information.

Continuing undergraduate degree-seeking students who do not attend for three or fewer semesters (including summer), and who were not academically suspended are automatically eligible to return without having to readmit (does not apply to graduate students). This policy includes degree-seeking undergraduates who are only taking classes through Continuing Education. During these semesters of non-enrollment,

students' CU Boulder email and MyCUInfo accounts remain open. To return, students should register for classes during the regular enrollment period for the returning term. Students who received a refund of the confirmation deposit must repay it when returning. Consult the return chart at www.colorado.edu/registrar/students/withdraw-cu (<http://www.colorado.edu/registrar/students/withdraw-cu>) for important details.

Nondegree Students

Students who wish to take CU Boulder courses but are not currently admitted to a degree program at the university are classified as "nondegree students." Students apply as nondegree students through the Division of Continuing Education (<http://www.ce.colorado.edu>). Nondegree students may enroll in credit classes through the ACCESS (Available Credit Courses for Eligible Special Students) Program, the Evening Credit Program, the Online Credit Program, the Applied Music Program and Summer Session.

All nondegree students must have completed high school or have a high school equivalency diploma. Nondegree applicants under the age of 22 not enrolled in high school must meet criteria similar to freshmen entering CU Boulder. To determine eligibility, applicants must provide an unofficial copy of their high school transcripts and ACT/SAT scores.

If students have been denied admission to an undergraduate degree program, they may not enroll as nondegree students in the ACCESS Program for the semester for which they sought degree program admission. Nondegree student admission does not guarantee future admission to any degree program.

Nondegree students may also enroll for courses on a pass/fail basis. These courses are counted toward credit hours of pass/fail course work permitted according to the rules of the college or school to which students are admitted once they achieve degree status.

Nondegree students must maintain a 2.00 cumulative GPA. Failure to maintain the required GPA will result in the inability to continue taking classes as a nondegree student.

High school students interested in taking courses at CU Boulder apply as nondegree students through the High School Concurrent Program (<http://ce.colorado.edu/programs/high-school-concurrent>) administered by the Division of Continuing Education.

International students who want to apply to the university as nondegree students should read the International Students section above. Students interested in teacher licensure should refer to the School of Education section.

Nondegree Students Transferring to a Degree Program

Students who are currently enrolled or have been enrolled at any CU campus as nondegree students may apply for admission to an undergraduate degree program.

Students wishing to transfer to a graduate degree program should refer to the Graduate School section and individual college and school sections.

A degree-seeking applicant may transfer an unlimited number of credit hours taken as a nondegree student on any University of Colorado campus. However, applicability of these credit hours toward degree requirements is established by the colleges and schools. It is suggested that a student apply to a degree program as soon as admission requirements, including MAPS deficiencies, have been met. It is essential

that former nondegree students actively seek academic advising from the appropriate dean's office once they have been accepted into a degree program.

Second Undergraduate Degree Applicants

Students may apply for a second undergraduate degree at the University of Colorado Boulder, but should explore the various options in graduate study available at the university before doing so. Students applying for a second undergraduate degree must follow transfer admission guidelines, and those students who are admitted must keep in mind that all college and major requirements must be met in order to complete degree programs satisfactorily. Restrictions mandated by general university policies, as well as specific college and school policies, include the following:

1. Applicants may not apply to the major in which they received their first undergraduate degree.
2. Applicants must apply to a specific major; applications for an open option or undetermined major cannot be considered.
3. Second undergraduate degree applicants in the Program in Environmental Design are encouraged to investigate graduate programs.
4. The Leeds School of Business and the College of Media, Communication and Information do not consider students who have already completed an undergraduate degree. These students are strongly encouraged to investigate graduate study.
5. Students who already have an undergraduate degree from the College of Engineering and Applied Science and who desire a second undergraduate degree are strongly encouraged to investigate graduate study as an option.
6. Credit hours earned as a nondegree student at the University of Colorado may not be used toward major degree requirements for a second degree in the College of Arts and Sciences.

Students from Other CU Campuses

Students who wish to transfer to Boulder from another University of Colorado campus (Colorado Springs, Denver or Anschutz), from CU Study Abroad or from CU Continuing Education should refer to the Transfer Applicants section. These students must send a high school transcript, SAT or ACT scores and an official transcript from each college or university attended (outside the University of Colorado system) to the Office of Admissions. Currently enrolled degree students are not required to pay the application fee. Special consideration is given to applicants transferring from degree programs at other campuses of the University of Colorado. Course work completed at other campuses in the University of Colorado System will be a part of the student's cumulative university record and will not be considered as transfer credit hours. However, the applicability of this course work toward specific CU Boulder degree requirements will be determined solely by CU Boulder colleges and schools. External transfer credit presented by students to other University of Colorado campuses will be evaluated by CU Boulder guidelines upon the student's matriculation into a degree program at CU Boulder.

Denied Admission as a Freshman

Students who were not admissible to the University of Colorado Boulder based on high school academic records are encouraged to apply for transfer admission after at least 24 credit hours of transferable college-level course work are completed or in progress. This includes any

minimum academic preparation standards (MAPS) requirements not met in high school.

Application Process

Application Priority Dates and Admission Notification

Applications for degree candidates may be submitted beginning in August for the following spring, summer and fall terms.

The university reserves the right to deny admission to applicants whose total credentials reflect an inability to assume those obligations of performance and behavior deemed essential by the university and relevant to any of its lawful missions, processes and functions as an educational institution.

Freshman Applicants

Students can apply to CU Boulder using the Common Application. All students will be reviewed in the order their application file is completed (application is submitted and all required documents are received and official).

Spring Freshman Applicants

Spring applications are processed on a rolling basis. The Office of Admissions begins notifying applicants about admission decisions in October. Decisions are made approximately six to eight weeks after an application is complete. Full consideration is given to applications that are complete (including the application fee and all required credentials) by the Oct. 1, 2017, deadline.

Summer and Fall Freshman Applicants

There are two admission notification periods for fall and summer 2018 candidates.

Non-Binding Early Action

Freshman applicants who complete their file by Nov. 15, 2017, are guaranteed early action and will receive an admission decision on or before Feb. 1, 2018.

Students meeting the non-binding, early action deadline may be admitted, postponed or denied admission. Postponed students will receive an additional review and are strongly encouraged to submit additional academic information to strengthen their applications. Students who are postponed do not typically receive an admission decision until April 1, 2018.

Early action students are not required to enroll at CU Boulder, but must, if they choose to attend, confirm their intent to enroll by May 1, 2018.

Freshman Application Deadline

The freshman application deadline is Jan. 15, 2018. Students may begin applying and completing their files in August. All applicants with completed files by Jan. 15, 2018, will be notified of their admission decision no later than April 1, 2018.

Students must, if they choose to attend, confirm their intent to enroll by May 1, 2018.

Transfer Applicants

If a student submits a complete application on or before the transfer application deadline, they will receive an admission decision within six to eight weeks.

A complete application includes test scores (if you have less than 24 college credit hours), transcripts (high school and college), personal statement and application fee.

Transfer Application Deadlines

- Spring 2018: Oct. 1, 2017
- Summer 2018: March 1, 2018
- Fall 2018 early notification: March 1, 2018
- Fall 2018 regular decision: June 15, 2018

Notifications begin rolling out on Oct. 1, 2017, for spring applicants and March 1, 2018, for fall and summer applicants. We process applications in the order in which they are received. The earlier a complete application is submitted, the earlier a decision will be made.

Where to Send the Application, Fee and Credentials

Unless otherwise instructed, mail all application materials to:

Office of Admissions
Regent Administrative Center 125
University of Colorado Boulder
552 UCB
Boulder, CO 80309-0552

Mailing Address

Applicants must keep their mailing address current at all times. It is used for mailings until the applicant arrives on campus. Notices are also sent to this address regarding admission, registration and new student welcome, as well as other information. If an address changes or is no longer valid, notify the Office of Admissions immediately at 303-492-6301.

Application Checklist

1. Online application for admission
2. \$50 nonrefundable (\$70 USD for international students) application fee, payable online (if sending a check or money order, make payable to the University of Colorado; print student's name and date of birth on check)
3. Official high school transcript
4. Official college transcripts (if applicable)
5. SAT or ACT test scores (if applicable)
6. Two personal essays (freshman applicants) or one personal statement (transfer applicants)
7. Letter of recommendation (freshman applicants only)
8. Résumé or activities list (optional)

Confirmation Procedures

All admitted students are encouraged to confirm their intent to enroll as soon as possible after receiving their admission notification. Admission must be confirmed by official notification to:

Office of Admissions

Regent Administrative Center 125
University of Colorado Boulder
552 UCB
Boulder, CO 80309-0552

Confirmation Postmark Deadlines

- Freshmen
 - Summer: May 1
 - Fall: May 1
 - Spring: Dec. 1
- Transfers: varies; see confirmation instructions

If students register for classes and then decide not to attend, they may be assessed tuition depending upon the circumstances. For spring and fall semester policies, visit the Office of the Registrar's Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage; for summer, visit Summer Session's Withdrawal (<http://www.colorado.edu/summer/resources/now-youve-enrolled/withdrawal>) webpage. Important policy differences exist for continuing students versus new, readmitted and transfer students.

The confirmation deposits are used as registration deposits each semester as long as registration is completed by the published deadline. Once students have attended CU Boulder, the deposit (minus any fees or other charges owed) will be returned when they graduate or officially withdraw from the university according to established deadlines.

Application Fees

Nonrefundable Application Fee (\$50/\$70 for international students)

University of Colorado Boulder Application

Pay online when submitting the application or by check or money order (made payable to the University of Colorado) after submission. If submitting a check or money order, include the student's full legal name and birth date. We recognize that some students may be faced with financial constraints in paying the application fee. Waivers can be granted for documented hardships if the student submits an application fee waiver form.

Common Application

Pay online when submitting the application. We recognize that some students may be faced with financial constraints in paying the application fee. Waivers can be granted for documented hardships if the student submits an application fee waiver form.

Students currently enrolled in an undergraduate degree program at another University of Colorado campus who are applying to an undergraduate degree program on the Boulder campus are not required to pay the application fee.

Required Credentials

Credentials or information sent by fax cannot be accepted as official documentation. Do not submit samples or photographs of design or artwork. A portfolio is not used for admission purposes and cannot be returned.

Official Transcripts

Official transcripts must be sent directly to the Office of Admissions from the issuing institution and must have the appropriate seals and signatures.

Other transcripts are not considered official. Transcripts that are marked, for example, "student copy," "issued to student" or "unofficial" are not accepted as official.

Unofficial transcripts cannot be used for admission or transfer credit purposes.

High School Transcript

Students should request that their high school send an official transcript of all work completed, beginning with grade 9, directly to the Office of Admissions, regardless of the number of college hours the student has completed (if any) or the date of graduation from high school.

Students who have attended more than one high school and whose most recent transcript does not include the complete high school record must submit official transcripts from each school.

If any part of the high school record is missing from the transcript, the processing of the application will be delayed.

Students who have not graduated and do not plan to graduate from high school must request an official certificate of high school equivalency and official GED scores, plus an official transcript of any high school work (grades 9–12) completed, to be sent to the Office of Admissions.

Official transcripts must be sent to the Office of Admissions from the issuing institution either electronically (transcripts@colorado.edu) or by mail and must have the appropriate seals and signatures. All credentials written in languages other than English must be accompanied by a literal certified English translation.

College Transcripts

Students should request that their official transcripts from each collegiate institution attended (except any campus of the University of Colorado) be sent directly from the issuing institution to the Office of Admissions. Be sure to include all institutions, regardless of the length of attendance, whether or not courses were completed and whether or not the record might affect admission or transfer credit. Also include any institutions attended during summers, interim terms and during high school.

Failure to list and submit transcripts from all institutions previously attended before enrolling at CU Boulder is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

SAT or ACT Test Scores

CU Boulder requires all freshman and transfer students (including U.S. citizens attending high school or college outside of the U.S) with fewer than 24 credits completed to submit an official score report for either the SAT or the ACT. International students only need to submit an SAT or ACT if they are graduating from a U.S. high school or wish to be considered for merit scholarships.

CU Boulder's SAT code is **4841** and the ACT code is **0532**.

Scores will be considered official if submitted electronically by the testing agency or if they are included on your official high school transcript.

The student's highest scores are used in the admission decision. If a student takes the same test more than once, we combine their highest score from each subsection to give them the highest overall score. Results from SAT or ACT tests taken in December or later may not be received in time if the student wishes to be considered for summer or fall admission of the following year.

For further information:

- consult a high school counselor,
- visit the SAT website (<http://www.collegeboard.com>), call 609-771-7600 or write to the College Board (SAT), P.O. Box 6200, Princeton, NJ 08541-6200, or
- visit the ACT website (<http://www.act.org>), call 319-337-1270 or write to ACT Registration, P.O. Box 414, Iowa City, IA 52243-0414.

Personal Essays

CU Boulder requires freshman applicants to submit two short personal essays and transfer applicants to submit one personal statement. Applications without essays are considered incomplete and will not be reviewed. Personal essays are the best way for the Office of Admissions to learn about applicants as individuals and to evaluate a student's academic performance within the appropriate context. There are no "correct" answers to the questions—responses should reflect the unique aspects and experiences of the applicant. The specific essay questions are available on the application.

Letters of Recommendation

One academic letter of recommendation will be required for all freshman applicants. The student's full legal name should be included at the top of recommendation letters.

Optional Documents

Applicants may submit additional letters of recommendation if you wish, however, doing so is optional. Applicants may also choose to submit a resume or list of co-curricular activities, work experience, leadership positions and awards.

College of Music applicants must also complete a College of Music application after their admission application has been submitted, provide a letter of reference and schedule an audition.

Credit by Examination

Advanced Placement (AP) Credit

AP Subject	Examination Title	Exam Score	CU Boulder Course Equivalent ¹	Credit Hours
Biology	Biology	5, 4	EBIO 1210, EBIO 1220, EBIO 1230 and EBIO 1240	8
		3	4 lower-division Arts & Sciences credit hours fulfilling the Natural Science lab in core and part of the overall Natural Science core requirements	4
Chemistry	Chemistry	5	CHEM 1113 and CHEM 1114	5
		4	CHEM 1021	4
		3	4 lower-division Arts & Sciences credit hours fulfilling the Natural Science lab in core and part of the overall Natural Science core requirements	4
Classics	Latin	5	LATN 1024, LATN 2114 AND LATN 2124	12
		4	LATN 1024 AND LATN 2114	8
		3	LATN 1024	4
Computer Science²	Computer Science A	5	CSCI 1300	4
	Computer Science Principles	5	CSCI 1300	4
Economics	Economics: Micro	5, 4	ECON 2010	4
	Economics: Macro	5, 4	ECON 2020	4
English	English Literature and Composition	5,4	ENGL 1500	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Literature & Arts in core	3
	English Language and Composition	5	WRTG 1250	3
		4	WRTG 1150	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Written Communication in core	3
Environmental Science	Environmental Science	5, 4	ENVS 1000	4
Fine Arts	Studio-Drawing Portfolio or Studio-General Portfolio	5, 4	3 lower-division ARTS elective credit hours	3
	Art History	5, 4	ARTH 1300 and ARTH 1400	6
Foreign Language	Chinese Language and Culture	5	CHIN 1020, CHIN 2110 and CHIN 2120	15
		4	CHIN 1020 and CHIN 2110	10
		3	CHIN 1020	5
	French Language and Culture	5	FREN 2110, FREN 2120 and FREN 3050	9
		4	FREN 2110 and FREN 2120	6
		3	FREN 2110	3
	German Language and Culture	5	GRMN 2020 and GRMN 3010	7
		4	GRMN 2010 and GRMN 2020	8
		3	GRMN 2010	4
		5	JPNS 1020, JPNS 2110 and JPNS 2120	15
	Japanese Language and Culture	4	JPNS 1020 and JPNS 2110	10
		3	JPNS 1020	5
		5	ITAL 1020, ITAL 2110 and ITAL 2120	11
	Italian Language and Culture	4	ITAL 1020 and ITAL 2110	8
		3	ITAL 1020	5
		Spanish Language and Culture³	5	SPAN 2110, SPAN 2120 and SPAN 3000
4	SPAN 2110 and SPAN 2120		6	
3	SPAN 2110		3	
		5	SPAN 1000 and SPAN 3002	6

		4	SPAN 1000	3
Geography	Human Geography	5, 4	GEOG 1992	3
Government	Comparative	5, 4	PSCI 2012	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Contemporary Societies in core	3
	United States	5, 4	PSCI 1101	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Contemporary Societies in core	3
History	US History	5, 4	HIST 1025	3
		3	3 lower-division Arts & Sciences credit hours fulfilling U.S. Context in core	3
	European History	5, 4	HIST 1012	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Historical Context in core	3
	World History	5, 4	3 lower-division History credit hours fulfilling the Historical Context in core	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Historical Context in core	3
Mathematics	Math-Calculus AB	5, 4	MATH 1300	5
		3	3 lower-division Arts & Sciences credit hours fulfilling Quantitative Reasoning and Mathematical Skills in core	3
	Math-Calculus BC	5, 4	MATH 1300 and MATH 2300	10
	Math-Calculus BC and AB subscore ¹	3	MATH 1300	5
	Statistics	5, 4	MATH 2510	3
		3	3 lower-division Arts & Sciences credit hours fulfilling Quantitative Reasoning and Mathematical Skills in core	3
Music	Music Theory	5	MUSC 1101, MUSC 1111, MUSC 1121 and MUSC 1131	6
		4	MUSC 1101 and MUSC 1121	3
Physics	Physics 1 ⁴	5, 4	PHYS 2010	5
	Physics 2 ⁴	5, 4	PHYS 2020	5
	Physics C-Mechanics	5	PHYS 1110	4
	Physics C-Electricity and Magnetism	5	PHYS 1120	4
Psychology	Psychology	5, 4	PSYC 1001	3
		3	3 lower-division Arts & Sciences credit hours fulfilling the Contemporary Societies in core	3

¹ There is no guarantee that all AP credit will apply to a specific degree program. The dean's office of each college and school makes the final determination on how AP credits apply toward degree requirements. When the credit granted for a score of 3 on an AP exam is just Arts & Sciences credit that fulfills a specific core category, CU Boulder advises students that they are likely to be more successful in their college career if they fulfill that core category with a CU Boulder course and use their AP credit as elective credit.

² Engineering Students: Check with academic advisor in major department. Students will need the ability to learn additional programming languages for further computer science courses.

³ Students who want to continue taking Spanish courses beyond their AP credit level must take the Spanish department placement test. If the results of this test place them below their AP level, the Spanish department strongly recommends enrolling at the lower of the two levels.

⁴ Does not apply toward degree requirements for students in the College of Engineering and Applied Science.

NOTE: This table was prepared based on spring 2016 exams. Credit awarded is subject to change based on faculty review of spring 2017 exams. The credit in this table is for students who matriculate at CU Boulder in the 2017–18 academic year. Students who matriculated at CU Boulder in previous academic years need to refer to the tables in the catalog for their matriculation year to find the appropriate credit.

International Baccalaureate (IB) Credit

IB Subject Examination Title	Exam Level	Exam Score	CU Boulder Course Equivalent ¹	Credit Hours
Anthropology	Higher	4	ANTH 2100 and 3 lower-division credit hours meeting human diversity requirement	6
Biology	Higher	4	EBIO 1210, EBIO 1220, EBIO 1230 and EBIO 1240	8
	Standard	4	4 lower-division Arts & Sciences credit hours fulfilling the Natural Science lab and part of the overall Natural Science requirement in core	4
Business and Management	Higher	4	BCOR 1015 and 3 lower-division BADM credit hours	6
Chemistry	Higher	7	CHEM 1113, CHEM 1114, CHEM 1133 and CHEM 1134	10
	Higher	6	CHEM 1113 and CHEM 1114	5
	Higher	5,4	4 lower-division Arts & Sciences credit hours fulfilling the Natural Science lab and part of the overall Natural Science requirement in core	4
	Standard	4	4 lower-division Arts & Sciences credit hours fulfilling the Natural Science lab and part of the overall Natural Science requirement in core	4
Chinese A: Language and Literature	Higher	4	CHIN 3110, CHIN 3120	10
	Standard	4	CHIN 2110, CHIN 2120	10
Dance	Higher	4	Elective DNCE credit hours; performance scores required to determine credit hours awarded	1-3
Design Technology	Higher	4	Elective credit hours	6
Economics	Higher	4	4 lower-division ECON credit hours fulfilling Contemporary Societies in core	4
	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Contemporary Societies in core	3
English A: Literature	Higher	4	ENGL 1500	3
	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Literature and Arts in core	3
English A: Language and Literature	Higher	4	3 lower-division Arts & Sciences credit hours fulfilling lower-division Written Communication in core	3

	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling lower-division Written Communication in core	3
Environmental Systems & Societies	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Natural Science in core	3
French B	Higher	7	FREN 2120 and FREN 2500	6
	Higher	6, 5	FREN 2110 and FREN 2120	6
	Higher	4	FREN 2120	3
French B	Standard	7	FREN 2110 and FREN 2120	6
	Standard	6	FREN 2110	3
	Standard	5	FREN 1050	5
	Standard	4	FREN 1010	5
French AB	Initio	7	FREN 1050	5
	Initio	6, 5	FREN 1010	5
Geography	Higher	4	GEOG 1992 and 3 lower-division GEOG credit hours	6
German B	Standard	6, 7	GRMN 1010 and GRMN 1020	8
	Standard	5, 4	GRMN 1010	4
Global Politics	Higher	4	3 lower division PSCI credit hours fulfilling Contemporary Societies in core	3
History—Rt.1: Europe and the Islamic World	Higher	4	HIST 1011 and 3 lower-division HIST credit hours fulfilling Historical Context in core	6
History—Rt.2: Africa	Higher	4	HIST 1228 and 3 lower-division HIST credit hours fulfilling Historical Context in core	6
History—Rt.2: Americas	Higher	4	HIST 1025 and 3 lower-division HIST credit hours fulfilling Historical Context in core	6
History—Rt.2: Asia and Oceania	Higher	4	Two 3-credit-hour lower-division HIST courses fulfilling Historical Context in core	6
History—Rt.2: Europe and the Middle East	Higher	4	HIST 1012 and 3 lower-division HIST credit hours meeting Historical Context core requirement	6
History—Rt.2: 20th Century World	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Historical Context in core	3
Italian B	Higher	7, 6, 5	ITAL 2110 and ITAL 2120	6
	Higher	4	ITAL 2110	3
Italian B	Standard	7	ITAL 2110 and ITAL 2120	6
	Standard	6	ITAL 2110	3
	Standard	5	ITAL 1020	5
	Standard	4	ITAL 1010	5
Italian AB	Initio	7	ITAL 1020	5

	Initio	6, 5	ITAL 1010	5
Japanese A: Language and Literature	Higher	4	JPNS 3110, JPNS 3120	10
	Standard	4	JPNS 2110, JPNS 2120	10
Japanese AB	Initio	5	JPNS 1010, JPNS 1020	10
Japanese B	Higher	7, 6	JPNS 3110, JPNS 3120	10
	Higher	5, 4	JPNS 2120, JPNS 3110	10
	Standard	4	JPNS 2110, JPNS 2120	10
Korean	Higher	4	Credit hours awarded and course equivalent are determined by oral exam	
Latin	Higher	6, 7	LATN 1024, LATN 2114, LATN 2124	12
	Higher	5	LATN 1024, LATN 2114	8
	Higher	4	LATN 1024	4
Further Mathematics	Higher	5	10 lower-division MATH credit hours fulfilling Quantitative Reasoning and Mathematical Skills in core	10
Mathematics	Higher	5	5 lower-division MATH credit hours fulfilling Quantitative Reasoning and Mathematical Skills in core	5
	Higher	4	3 lower-division MATH credit hours fulfilling Quantitative Reasoning and Mathematical Skills in core	3
	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Quantitative Reasoning & Mathematical Skills in core	3
Mathematical Studies	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Quantitative Reasoning & Mathematical Skills in core	3
Music	Higher	4	Elective credit hours	6
Philosophy	Higher	4	PHIL 1000 and 3 lower-division PHIL credit hours	6
Physics²	Higher	4	PHYS 2010 and PHYS 2020	10
	Standard	4	4 lower-division Arts & Sciences credit hours fulfilling the Natural Science lab and part of the overall Natural Science requirement in core	4
Psychology	Higher	4	PSYC 1001 and 3 lower-division PSYC credit hours fulfilling Contemporary Societies in core	6
	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Contemporary Societies in core	3
Russian B	Higher	4	RUSS 2010 and RUSS 2020	8
	Standard	5	RUSS 2010 and RUSS 2020	8

Spanish A: Language and Literature	Higher	4	SPAN 3000 and SPAN 3100	8
Spanish B	Higher	7, 6	SPAN 2110, SPAN 2120 and SPAN 3000	11
	Higher	5, 4	SPAN 2110 and SPAN 2120	6
	Standard	4	SPAN 1010 and SPAN 1020	10
Spanish AB	Standard	6	SPAN 1010	5
Swedish A: Language and Literature	Standard	4	SCAN 3020	3
Theatre	Higher	4	THTR 1019 and 3 lower-division THTR credit hours	6
Visual Art	Higher	4	3 lower-division ARTS credit hours and 3 lower-division ARTS credit hours fulfilling Literature and Arts in core (Consult faculty with portfolio for further consideration of fine arts course equivalents.)	6
	Standard	4	3 lower-division Arts & Sciences credit hours fulfilling Literature and Arts in core	3

¹ There is no guarantee that all IB credit will apply to a specific degree program. The dean's office of each college and school makes the final determination on how IB credits apply toward degree requirements. When the credit granted for a Standard Level IB exam is just Arts & Sciences credit that fulfills a specific core category, CU Boulder advises students that they are likely to be more successful in their college career if they fulfill that core category with a CU Boulder course and use their IB credit as elective credit.

² Does not apply toward degree requirements for students in the College of Engineering and Applied Science.

NOTE: This table was prepared based on spring 2016 exams. Credit awarded is subject to change based on faculty review of spring 2017 exams. The credit in this table is for students who matriculate at CU Boulder in the 2017–18 academic year. Students who matriculated at CU Boulder in previous academic years need to refer to the tables in the catalog for their matriculation year to find the appropriate credit.

College-Level Examination Program

Credit for College Board subject examinations of the College-Level Examination Program (CLEP) in general biology, general chemistry, general psychology, introductory macroeconomics, introductory microeconomics, introductory sociology and calculus may be granted for a score at or above the 67th percentile. This credit is applied toward degree requirements at the discretion of the student's dean. Refer to the appropriate dean's office for the policy of that college or school.

Credit for CLEP subject examinations cannot be evaluated from college or high school transcripts; score reports must be submitted directly from the College Board. CLEP general examinations are not accepted for credit at CU-Boulder.

CLEP tests are administered through Career Services, 303-492-5854.

Transfer of College-Level Credit

The Office of Admissions performs an initial evaluation of transfer credit after applicants have been admitted. A complete evaluation of transfer credit cannot be made until all official credentials have been received.

The evaluation is made using the official transcripts sent directly to the university from each one of the applicant's previous colleges. Official transcripts exhibit the official seal and signature of the registrar. Transcripts that are marked "student copy," "issued to student," or "unofficial" are not accepted as official. Faxed transcripts are not accepted.

Course work of comparable content and scope to the CU Boulder curriculum will generally be transferred if it was completed at colleges or universities accredited by the Higher Learning Commission, or other regional associations at the time the work was completed. For international colleges or universities, the international equivalent of regional accreditation or Ministry of Education recognition will be considered. If course work was completed at a school not regionally accredited, the student may specifically request that their course work be considered for transfer. CU Boulder will utilize the recommendations of American Association of Collegiate Registrars and Admissions Officers (AACRAO) when making its decision.

These recommendations include but are not limited to:

- Educational quality of the sending institution
- Comparability of credit to be transferred to CU Boulder
- Applicability of the credit in relation to the programs being offered at CU Boulder
- Additional documentation that students may be required to provide regarding the course work for transferability

Exceptions to Recognition of Regional Accreditation

Transferability is based on the practices of the leading university, as reported to AACRAO, in the state where the institution is located. CU Boulder will make the decision on transferability based on the above criteria for institutions within the state of Colorado.

For Advanced Placement, International Baccalaureate, College Level Examination Program or military credit, refer to the detailed criteria in the corresponding sections.

Evaluation of Credit

Only courses taken at a college or university of recognized standing with grades of C- (1.70) or better are accepted for transfer. All transferred courses are recorded on the student's academic record.

Each college and school at CU Boulder determines:

- How transferred course semester credit hours are applied toward graduation requirements in accordance with the policies of the college or school
- The maximum number of semester credit hours that may transfer from a two-year or four-year postsecondary institution
- The minimum number of semester credit hours that must be completed on the Boulder campus in order to receive a degree
- The minimum number of semester credit hours that must be completed as a degree student in residence on the Boulder campus to receive an undergraduate degree
- The maximum number of semester credit hours earned through correspondence or in a similar format that are accepted toward a baccalaureate degree

Credit hours should have been earned no more than 10 years prior to transferring into an undergraduate degree program at the University of Colorado Boulder. Any determination of acceptance of semester credit hours toward the degree based on the content and the age of the credit is made in the college or school dean's office or by the student's major department.

College-level work taken during high school is evaluated in accordance with general guidelines for transfer credit at CU Boulder. Official college transcripts of work taken must be received in order for transfer credit to be awarded.

Course Work Requiring Additional Review

The following course work will require additional information before a decision can be made on acceptance for transfer credit.

- Independent study courses
- Internships
- Workshops
- Graduate course work

- Military credit
- Professional programs

Course Work Not Accepted for Transfer Credit

The following course work will not be accepted for transfer credit and will not count toward a degree at Boulder:

- any courses in which the grade earned is below a C- (1.70)
- courses identified by CU Boulder as remedial, such as remedial English, mathematics, science and developmental reading
- vocational-technical courses that are offered at two-year and proprietary institutions (exceptions may be granted only by the CU Boulder dean responsible for the student's curriculum—when exceptions appear to be warranted, appropriate department heads make recommendations to their respective deans regarding credit for such courses)
- courses in religion that constitute specialized religious training or that are doctrinal in nature
- credits earned for work experience or through a cooperative education program
- outdoor leadership education course work
- credits earned in physical education activity courses
- courses or programs identified as college orientation

Appeals Process

Students who wish to appeal the transferability of course work must write a letter within the first semester after the work is posted on the University of Colorado Boulder record or after receiving notice from the Office of Admissions that the course work was not accepted for transfer credit. The letter must be addressed to the Transfer Credit Department, Office of Admissions, and include:

- The name(s) of the previous institution(s) attended, the course number and title of each course for which the student was denied transfer credit and the date(s) of enrollment in each course
- A copy of the catalog description (from the appropriate year) for each course in question
- A copy of the syllabus or course outline (from the appropriate year) for each course in question. This information can be obtained from the sending institution
- A statement indicating why the credit(s) should be accepted

The Office of Admissions will re-evaluate the course(s) for which the student is requesting reconsideration in consultation with the appropriate dean or chair. A written response will be delivered to the student in a timely manner once the appropriate faculties have reviewed the course materials, past practices and the student's specific circumstances.

Transfer Credit From University of Colorado Campuses

Course work completed at other campuses in the University of Colorado system will be a part of the student's cumulative university record and will not be considered as transfer credit. However, the applicability of this course work towards specific CU Boulder degree requirements will be determined solely by CU Boulder colleges and schools. External transfer credit presented by students to other University of Colorado

campuses will be evaluated by CU Boulder guidelines upon the student's matriculation into a degree program at CU Boulder.

Number of Credit Hours Required for Graduation

Transfer students are held to the same residency and degree requirements as students who begin their undergraduate degree program on the Boulder campus. This assumes that transfer credit hours are in courses comparable in level and content to those required for graduation from an undergraduate degree program at the Boulder campus. College or school residency requirements, meaning the number of credit hours required to be taken as a degree student once admitted on the Boulder campus, are the same for transferring and nontransferring students.

Credit for Correspondence and Online Work

Each college and school determines the maximum number of credits taken through correspondence and online programs that are accepted toward a baccalaureate degree.

College-Level Work Taken during High School

If you took college-level courses while enrolled in high school, you may be able to transfer the credit to CU Boulder. Only courses taken at a college or university of recognized standing with grades of C- or better are accepted for transfer. All college-level work will be evaluated in accordance with CU Boulder transfer credit guidelines. College-level work taken concurrently with a high school program may be used to satisfy MAPS requirements. You must have an official college transcript sent directly to the Office of Admissions in order for transfer credit to be evaluated.

Advanced Placement Examinations

Credit for College Board Advanced Placement examinations cannot be evaluated from college or high school transcripts; score reports from the College Board must be submitted directly to the university for evaluation. For more information and a guide to equivalencies, refer to Freshman Applicants and the chart in this section or visit www.colorado.edu/admissions/transfer (<http://www.colorado.edu/admissions/transfer>).

College-Level Examination Program

Credit for College Board subject examinations of the College-Level Examination Program (CLEP) in general biology, general chemistry, general psychology, introductory macroeconomics, introductory microeconomics, introductory sociology and calculus may be granted for a score at or above the 67th percentile. This credit is applied toward degree requirements at the discretion of the student's dean. Refer to the appropriate dean's office for the policy of that college or school.

Credit for CLEP subject examinations cannot be evaluated from college or high school transcripts; score reports must be submitted directly from the College Board. CLEP general examinations are not accepted for credit at CU Boulder.

International Baccalaureate Examinations (IB)

In general, credit is granted for approved IB examinations at the higher level with a score of 4 or better. Students admitted to the University of Colorado Boulder who have graduated from high school with an International Baccalaureate Diploma shall be granted 24 hours of college credit. This credit will be applied toward degree requirements ONLY if approved by the college or school. Depending on the student's degree program, some of the 24 credit hours may not be applicable toward degree requirements. No CU Boulder tuition will be charged for these credits and the 24 credits will only be granted if the student receives a score of 4 or better on an examination administered as part of the IB Diploma program. If the student scores less than 4 on each IB subject test, the credit hours granted will be reduced accordingly. Official scores must be sent to the admissions office directly from the IB organization. For more information and a guide to equivalencies, refer to Freshman Applicants (p. 98).

Military Credit

Credit for military schooling is evaluated upon receipt of Form DD 214, Service Separation Certificate or the Joint Services Transcript (JST). Only work that has received an upper-division baccalaureate recommendation by the American Council on Education (ACE) can be awarded credit. This work, however, is transferred and recorded at the lower-division level. Foreign language credit taken through the State Department, Department of Defense or Defense Language Institute is assigned the recommended ACE credit.

Transfer Credit Conversion

CU Boulder operates on a semester system. Other campuses, including CU Boulder, operate on a two-term or semester system. Course credits from quarter system institutions must be converted from quarter hours to semester hours or credits. One quarter credit is equivalent to two-thirds of a semester credit. To convert quarter hours to semester hours, multiply the number of quarter hours by two-thirds and round off the total to the nearest tenth. For example, 4 quarter hours $\times 2/3 = 2.67$ or 2.7 semester hours of credit, or 3 quarter hours $\times 2/3 = 2$ semester hours of credit.

Minimum Academic Preparation Standards

One unit equals one year of high school study or one semester of college course work.

Program in	College of Arts & Sciences / CMCI	Leeds School of Business	College of Engineering & Applied Science	College of Music
Environmental Design	English: 4	English: 4	English: 4	English: 4
	(includes 2 of composition)	(includes 2 of composition)		

Mathematics: 4 (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)

Mathematics: 4 (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)

Mathematics: 4 (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)

Mathematics: 4 (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)

Mathematics: 4 (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)

Natural science: 3 (includes physics and/or biology)

Natural science: 3 (includes 2 of lab science, 1 of which must be either chemistry or physics)

Natural science: 3 (includes 2 of lab science, 1 of which must be either chemistry or physics)

Natural science: 3 (includes 2 of physics AND 1 of chemistry or biology; OR 2 of chemistry AND 1 of physics or biology; OR 2 of biology AND 1 of chemistry or physics; OR 1 of physics AND 1 of chemistry or biology AND 1 of another science)

Natural science: 3

Social science: 3

Social science: 3 (includes 1 of U.S. or world history and 1 of geography; if U.S. history is used to meet the history requirement, the geography requirement may be met with 1/2 unit of geography and 1/2 unit of world history)

Social science: 3 (includes 1 of U.S. or world history and 1 of geography; if U.S. history is used to meet the history requirement, the geography requirement may be met with 1/2 unit of geography and 1/2 unit of world history)

Social science: 3 (includes 1 of U.S. or world history)

Social science: 3

Single foreign language: 2

Single foreign language: 2

Single foreign language: 2

Single foreign language: 3 (or 2 units in each of 2 separate foreign languages)

Single foreign language: 2

Academic elective: 1

Academic elective: 1 (in the arts)

Total credit units: 17 **Total credit units: 17** **Total credit units: 17** **Total credit units: 17** **Total credit units: 17**

New Student & Family Programs

New Student & Family Programs works to support new undergraduate students and their family members as students transition to campus. New Student & Family Programs works with incoming students from the time they decide to attend CU Boulder through their first few weeks on campus. New Student & Family Programs continues to support family members throughout the student's experience at CU Boulder.

Incoming undergraduate students must complete an online orientation program, the Online Experience, in order to register for classes. The Online Experience helps incoming students learn more about student success, advising, registration and campus resources. New students should check their CU Boulder email account for more information about the Online Experience and other important next steps.

In addition to the online requirement, new students and their family members are encouraged to attend a New Student Welcome Day on campus. These optional one-day programs offer incoming students and family members an opportunity to come to campus and connect with academic advisors, faculty, current students and student life opportunities.

New Student & Family Programs also collaborates with campus partners to plan fall and spring Welcome events surrounding the first day of classes. Students participate in programs and have opportunities to connect with current students, faculty and staff to create a healthy and positive transition to CU Boulder.

For more information, visit the New Student & Family Programs (<http://www.colorado.edu/orientation>) website.

Academic Advising

Academic advising is a critical component in the success of undergraduate students. Its goal is to assist students in creating and achieving educational, career and life goals. Advising is more than offering information about academic courses and programs; it also involves encouraging students to formulate important questions about the nature and direction of their education. Advisors help students to explore their options and personalize their academic experience.

Advising Centers

There are several advising centers across the Boulder campus, primarily housed in colleges and schools. Academic advisors are professional staff or faculty members who have an expertise in navigating the entire curriculum and in developing mentoring relationships with students. Students are encouraged to meet with an advisor at least once each semester.

College of Arts & Sciences: Serving students pursuing the natural sciences, social sciences, and arts and humanities.

Leeds School of Business: Serving students pursuing accounting, finance, management and marketing.

School of Education: Serving students pursuing Bachelor of Arts in elementary education, Bachelor of Arts in leadership and community engagement, education minor, leadership studies minor and teacher licensure.

College of Engineering & Applied Science: Serving students pursuing aerospace engineering; chemical and biological engineering; civil, environmental and architectural engineering; electrical, computer and energy engineering; mechanical engineering; and computer science.

Program in Environmental Design: Serving students pursuing design studies or architecture, planning & landscape.

College of Media, Communication and Information: Serving students pursuing advertising, PR and media design; communication; critical media practices; information science; intermedia art, writing and performance; journalism; and media studies.

College of Music: Serving students pursuing music and music performance.

Enrollment & Records

Class Level

Class level is based on the total number of credit hours passed, as follows:

Freshman	0–29.9 credit hours
Sophomore	30–59.9 credit hours
Junior	60–89.9 credit hours
Senior	90–123.9 credit hours
Fifth-Year Senior	124 and above credit hours

The normal course load for most undergraduates is 15 credit hours each semester.

Course Load

Full-time status for undergraduate students is 12 or more credit hours for fall, spring and summer semesters for financial aid purposes. For enrollment verification and academic purposes (not related to financial aid), 12 credit hours is considered a full-time load in the fall and spring semester, and 6 credit hours is considered full time in the summer. For further information, view the Office of the Registrar's enrollment grid (<http://www.colorado.edu/registrar/students/registration/enroll-classes/credit-hour-limitations>).

Students who receive financial aid or veterans benefits or who live in university housing should check with the appropriate office regarding course-load requirements for eligibility purposes.

Intrauniversity Transfer Students

Students wishing to change colleges or schools within the CU Boulder campus follow the intrauniversity transfer (IUT) guidelines from the college or school into which they wish to transfer.

For more information on recommended course work in preparation for an IUT and other criteria, students need to consult college and school sections of this catalog or talk with an academic advisor in the program to which they plan to transfer. Some colleges and schools do not accept intrauniversity transfer students during the summer. It is important to note that admission to a college through the IUT process is competitive,

and not all students who apply are admitted. Decisions are based on course preparation, credit hours completed, grade point average and other criteria required by the specific college or school.

Degrees & Majors

In order to earn a baccalaureate degree from the University of Colorado Boulder, students must meet all degree and major requirements for their specific program of study and earn a minimum of 120 cumulative credit hours and a minimum of a 2.00 GPA. It is important to note that some degree and program requirements are higher than these minimum standards. See college and school sections of this catalog for specific degree policies and requirements.

In addition, students at CU Boulder may pursue dual degrees, concurrent degrees or additional majors, minors and/or certificates.

Double Degrees

A double degree at the baccalaureate level can be two different degrees from the same college or school (e.g., a BA and BFA from the College of Arts and Sciences), or two degrees from different colleges or schools (e.g., a BA from the College of Arts and Sciences and a BS from the College of Engineering and Applied Science). In order to earn a double baccalaureate degree, students must meet all individual degree requirements and receive approval from the academic college or school for each degree. Both degrees must be confirmed with the same graduation date (degrees are awarded concurrently).

Students who wish to pursue an additional baccalaureate degree *after* graduating with a baccalaureate degree from CU Boulder must file and application for readmission to the university. In addition, students should work with an academic advisor in the degree program they wish to add in order to determine appropriate procedures and additional requirements (e.g., additional residency requirements may apply beyond course requirements for the second degree and major). Not every college and school permits students to complete an additional baccalaureate degree after graduation.

Bachelor's/Accelerated Master's Degrees

Qualified students may be approved to pursue concurrent baccalaureate and master's degree programs, such as the Bachelor of Arts/Master of Arts (BA/MA). These programs are designed as accelerated, integrated curricula in which approved students are permitted to apply select courses/credits to both the baccalaureate and master's degrees.

Additional Majors

Some colleges and schools permit students pursuing a baccalaureate degree to graduate with more than one major (e.g., economics and French) under the same degree (e.g., BA) by completing all requirements for each major. The majors must be completed concurrently and will post to a degree record with the same graduation date. A minimum of 120 total credit hours is required for a degree with additional majors.

Minors

Students earning a baccalaureate degree may participate in a minor program. Minors are offered in a number of undergraduate colleges, schools and programs.

Certificates

Undergraduate students may pursue formal certificates in a variety of academic or interdisciplinary subjects. Each certificate program has unique requirements. Degree-seeking students who been verified to have

completed certificate requirements will have the certificate/s posted to their academic records at the time of graduation. Non-degree students who are approved to pursue select certificate programs must be admitted through Continuing Education.

Degree Audit

Degree audit reports are available for most degree and certificate programs to help students and advisors track requirements and progress. The degree audit tool may be accessed through MyCUInfo (<http://mycuinfo.colorado.edu>).

Academic Standing

Each college and school at CU Boulder has published minimum requirements for undergraduate students to remain in good academic standing. See respective college and school sections related to academic standards, including policies for probation and suspension.

In addition, federal regulations require students to make satisfactory academic progress in a program of study to be eligible for financial aid. See the Satisfactory Academic Progress (SAP) Policy (<http://www.colorado.edu/financialaid/policies/satisfactory-academic-progress-sap-policy>) webpage.

Class Rank

Undergraduate students can get a document that indicates their class rank among students graduating within the last year. Students in the College of Arts and Sciences and the College of Engineering and Applied Science will have a ranking within their major degree program. Students in other schools, colleges and programs will have a ranking within their college. The request form is available in MyCUInfo.

College-Level Examination Program

Credit for College Board subject examinations of the College-Level Examination Program (CLEP) in general biology, general chemistry, general psychology, introductory macroeconomics, introductory microeconomics, introductory sociology and calculus may be granted for a score at or above the 67th percentile. This credit is applied toward degree requirements at the discretion of the student's dean. Refer to the appropriate dean's office for the policy of that college or school.

Credit for CLEP subject examinations cannot be evaluated from college or high school transcripts; score reports must be submitted directly from the College Board. CLEP general examinations are not accepted for credit at CU-Boulder.

CLEP tests are administered through Career Services, 303-492-5854.

Course Challenge

The Institutional Undergraduate Course Challenge policy provides limited opportunities for students to take an examination (or equivalent) and earn credit for a course without registering for or taking the course. Applications for institutional course challenge are available on the Office of the Registrar web site. Requesting a course challenge option for any Guaranteed Transfer (GT) Pathways (<http://higher.ed.colorado.gov/academics/transfers/gtPathways/curriculum.html>) general education course is at the enrolled student's discretion.

Institutional course challenge requests are not approved if a student previously enrolled in the course (including earned transfer or test credits). This includes attempts in which a failing mark (F) or a W (drop) is recorded for the course. A student may only attempt to challenge an

individual CU Boulder course one time. If a student does not achieve a C- or better on an institutionally devised challenge exam, the student must enroll in the equivalent course in order to earn credit for it. A maximum of 36 credits may be earned through institutional course challenge.

Successful course challenges are recorded on transcripts as earned institutional, residential credit within the term completed. No grades or quality points are assigned ('CR' is recorded to denote earned credit). The name and catalog number of the course, credits, and that it was a challenge exam appear on transcripts.

CU Boulder assesses an administrative fee of \$115 for each institutional challenge exam (or the equivalent) attempted, regardless of a student's outcome on the challenge attempt.

Credit earned through institutional course challenge will apply to general education requirements, but may not always apply to specific degree requirements (see individual college/school policies and degree requirements).

Financial Aid

The Office of Financial Aid's primary goal is to ensure that students who have been admitted to the university have access to the resources available to fund their education. CU Boulder students may be eligible to receive financial aid from our office each year from federal, state, university and private sources.

Applying for Financial Aid

Students apply for financial aid by completing the Free Application for Federal Student Aid (FAFSA) at www.fafsa.ed.gov (<http://fafsa.ed.gov>). The FAFSA helps determine a student's eligibility for grants, work-study and loans, as well as some scholarships. The Office of Financial Aid provides students with their award eligibility to accept or decline.

For financial aid for fall 2017, spring 2018, and summer 2018, the 2017–18 FAFSA must be submitted. Students should apply as soon as possible after the FAFSA opens October 1, 2016, as some funds are first-come, first-served. Students must reapply for financial aid every year.

The Office of Financial Aid receives the FAFSA results electronically if CU Boulder is listed on the application (school code 001370).

Eligibility

Financial aid eligibility is based on the results of the FAFSA and the cost to attend CU Boulder.

The FAFSA application determines the Expected Family Contribution (EFC), a reference number schools use to best determine the family's financial situation. It's **not** the amount of money a family will pay for college, nor is it the amount of financial aid a student will receive.

Each year the Office of Financial Aid calculates the estimated cost of attendance including tuition, fee, housing and food, books and supplies, transportation, medical and personal expenses. The EFC is subtracted from the cost of attendance to determine the student's financial need. This financial need is considered when determining aid eligibility.

View more information on cost and budget examples (<http://www.colorado.edu/financialaid/cost-financial-aid>).

Financial Aid Awards

Financial Aid awarding begins as early as the February before a fall semester, but aid is continually offered as long as funds are available. Freshman and transfer students applying for aid for the 2017–18 academic year are encouraged to submit their FAFSA applications and any additional documentation requested by February 15, 2017 in order to receive aid information before the confirmation deadline of May 1, 2017. Types of awards available to CU Boulder students are listed below.

Loans

Students submit the FAFSA (<http://fafsa.ed.gov>) to be considered for the following loan programs.

Federal Direct Subsidized and Unsubsidized Loans (<http://www.colorado.edu/financialaid/types-aid/undergraduate-student-loans/federal-direct-loans-undergraduate-students>)

Funds are awarded and disbursed by CU Boulder. Undergraduate students may qualify for a combination of subsidized (i.e., federal government pays the interest) and unsubsidized loans. The interest rates for direct loans are determined annually. Annual limits depend on the year in school: freshmen can be awarded up to \$5,500, sophomores \$6,500, and juniors and seniors \$7,500. Independent students may borrow an additional amount of unsubsidized loans, freshmen and sophomores \$4,000, juniors and seniors \$5,000.

Interest on unsubsidized loans can be repaid while the student is in school. Repayment begins six months after the student graduates or ceases to be enrolled at least half-time (6 credit hours for undergraduates; 4 credit hours for graduates).

Federal PLUS Loan for Parents (<http://www.colorado.edu/financialaid/parent-loans>) or Graduate Students (<http://www.colorado.edu/financialaid/types-aid/graduate-loans/federal-graduate-plus-loans>)

These federal loans are available to graduate students and parents of dependent undergraduate students. The interest rate is fixed at 6.31 percent. Borrowers must complete a credit check.

Note: Parents borrowing a PLUS loan for their student will be regarded as parental support on in-state residency petitions for dependent students. Parents may request a deferment on payments until their student has finished with school.

Work-Study (<http://www.colorado.edu/studentemployment/work-study>)

Students should submit the FAFSA (<http://fafsa.ed.gov>) to be considered for work-study, since it is based on financial need. Students are awarded an amount of money they can work to earn through on-campus or approved off-campus agencies. These students receive a paycheck just like a non work-study job. Students may apply for a variety of jobs at competitive rates. Jobs can be found online through the CU Boulder Student Job (<https://ofa.colorado.edu/StudentJobsStudentLogin/login.aspx>) database.

Grants for Undergraduate (<http://www.colorado.edu/financialaid/types-aid/undergraduate-grants>) and Graduate (<http://www.colorado.edu/financialaid/types-aid/grantsassitantships-graduate-students>) Students

Grants are awards that do not have to be repaid. Students should submit the FAFSA (<http://fafsa.ed.gov>) to be considered for federal, state

and institutional need-based grants (including Pell, SEOG, Colorado Responsibility Grant, etc.).

Scholarships (<http://www.colorado.edu/scholarships>)

Donations from private individuals, corporations, foundations and the University of Colorado are all sources for scholarships. Incoming students are automatically considered for some scholarships through their admissions application.

CU Boulder Scholarship Application (<http://www.colorado.edu/scholarships/cuboulder-scholarship-app>)

Students may apply for scholarships offered by the Office of Financial Aid through the student portal beginning October 1 each year. Your FAFSA (<http://fafsa.ed.gov>) must be received no later than February 15 to be considered for scholarships with a financial need requirement. Some scholarships may have earlier deadlines.

Prospective students do not need to wait for formal acceptance to CU Boulder before applying for financial aid or scholarships.

Scholarships are highly competitive at CU Boulder. The selection committee considers academic achievement, honors, leadership, school activities and service to the community. Students should also search for scholarship opportunities within their academic program, college, club or campus organization.

Private External Scholarships (<http://www.colorado.edu/scholarships/private-scholarships>)

Students who receive a private scholarship from an organization outside the university must report the scholarship through the student portal. To ensure faster process, the check should be mailed or dropped off with a completed donor form (<http://www.colorado.edu/scholarships/sites/default/files/attached-files/donorform.pdf>). In addition, students are encouraged to write to their donors and express their gratitude.

When a scholarship donor does not specify how to disburse the funds through a donor form (<http://www.colorado.edu/scholarships/sites/default/files/attached-files/donorform.pdf>), the financial aid office equally divides awards of \$1,000 or more between the fall and spring semesters. Private scholarships less than \$1,000 are applied in full to the current semester bill.

Donors should mail their checks, payable to the University of Colorado, with a donor form (<http://www.colorado.edu/scholarships/sites/default/files/attached-files/donorform.pdf>) to:

University of Colorado Boulder
Office of Financial Aid, ATTN: Scholarship Services
77 UCB
Boulder, CO 80309-0077

Donors should mail scholarship checks at least one month prior to the bill due date to avoid incurring late and service charges. If a student's scholarship check is not submitted before by the bill payment deadline, he or she should make other arrangements to pay the bill.

Policies

The Office of Financial Aid follows regulations provided by the Department of Education, the Higher Education Reconciliation Act of 2005, the Family Education Rights & Privacy Act (FERPA) and in-house policies to administer federal, state and university funding. View a full

list of financial aid policies (<http://www.colorado.edu/financialaid/policies>) on our website.

Adjustments to Financial Aid (<https://www.colorado.edu/financialaid/policies/adjustments>)

There are a variety of circumstances that may require an adjustment to a student's financial aid award. Students should understand how dropping and adding courses, receiving other aid, or corrections on their FAFSA will impact their aid.

FERPA (<https://www.colorado.edu/financialaid/ferpa>)

The Family Education Rights & Privacy Act (FERPA) is a Federal law that protects the privacy of student educational records (which includes financial aid).

Satisfactory Academic Progress (SAP) (<https://www.colorado.edu/financialaid/policies/satisfactory-academic-progress-sap-policy>)

Students who apply for financial aid at CU Boulder are responsible for knowing and complying with the satisfactory academic progress policy. Briefly, the policy outlines the requirements to maintain satisfactory progress (i.e., minimum grade point average [GPA], completion rate, etc.), the consequences of failing to meet the requirements, and the process for appealing if the student loses eligibility.

Study Abroad (<https://www.colorado.edu/financialaid/apply-aid/study-abroad>)

Students must be enrolled in a CU Boulder study abroad program to be eligible for financial aid through CU Boulder's financial aid office. Students participating in a study abroad program through another university are not eligible.

Withdrawal Policy (<https://www.colorado.edu/financialaid/policies/financial-aid-withdrawal-policy>)

If a student enrolls at CU Boulder, receives financial aid, then withdraws, his or her financial aid is adjusted according to federal regulations. The student may owe a bill to the university after the financial aid is adjusted.

Policies on drug conviction, student loan code of conduct, students rights and responsibilities and verification are available on the Financial Aid Policy web page (<https://www.colorado.edu/financialaid/policies>).

Student Employment

Research studies indicate that students who work are as successful academically as those who do not. Jobs provide students with income, work experience and the opportunity to explore career options.

Work-Study (<http://www.colorado.edu/studentemployment/work-study>)

Work-Study is need-based financial aid. In order to determine eligibility for work-study, students must first submit the Free Application for Federal Student Aid (FAFSA) (<http://www.fafsa.ed.gov>). Get a quick overview of the program with our work-study video (<http://www.colorado.edu/studentemployment/video/work-study>).

Find a Job (<http://www.colorado.edu/studentemployment/find-job>)

Student Employment posts part-time on-campus and off-campus jobs for both work-study and non-work-study students. In addition, an on-call

temporary employment service allows students to register for occasional work including one-time child care, yard work and clerical jobs.

Student Employee Work Hours Policy

Undergraduate student employees are limited to working a maximum of 25 hours per week during the fall and spring semesters and 40 hours per week during the summer, per the Student Hourly Employee Work Hours Policy (<http://www.colorado.edu/studentemployment/policies>). The policy does not affect students working in non-university off-campus jobs, though we encourage students to prioritize their academics first when considering outside work commitments. View more information about this policy and other student employment policies on the Student Employment policy web page (<http://www.colorado.edu/studentemployment/policies>). (<http://www.colorado.edu/studentemployment>)

Student Employment is here to help connect students and employers. Visit Student Employment in Regent Administrative Center 205 (<http://www.colorado.edu/campusmap/map.html?bldg=RGNT&x=24&y=9>), call **303-492-7349** or email studentemployment@colorado.edu for more information.

Student Finances

Expenses

College Opportunity Fund (COF)

The College Opportunity Fund (COF), created by the Colorado Legislature, provides a stipend to eligible undergraduate students paying in-state tuition. The stipend pays a portion of total in-state tuition for eligible undergraduate students who attend a Colorado public institution or a participating private institution. Eligible undergraduate students must be admitted and enrolled at a participating institution to use the stipend for eligible undergraduate classes.

To receive the COF stipend, students must both apply for and authorize (two separate steps) it. For instructions, visit the Apply for and Authorize COF (<http://www.colorado.edu/registrar/students/cof/apply-authorize>) webpage. New accounts offer 145 available undergraduate credit hours.

COF-eligible students who exceed 145 eligible COF hours toward their degree may apply for additional semesters of eligibility. For more information, visit the COF Lifetime Limit Extensions (<http://www.colorado.edu/registrar/students/cof/extensions>) webpage.

Details of the COF program are determined by the Colorado Department of Higher Education (CDHE) and the College Assist Program (<http://cof.college-assist.org>). Students with questions about COF may contact the Office of the Registrar (<http://www.colorado.edu/registrar/about/contact-us>).

Confirmation Deposit

All new students (both in-state and out-of-state) must confirm their enrollment at the university by official notification and deposit of \$200. The deposit is nontransferable and must be paid by all students, regardless of financial aid awards. Students who have paid the deposit and who decide not to attend CU Boulder forfeit their deposit. Students who submit deposits after enrollment levels have been reached will not be accepted, and their deposits will be returned.

The confirmation deposit is not credited toward tuition and fees. It is refunded when a student graduates or officially withdraws from

CU Boulder within established dates and guidelines after paying any outstanding university obligations. Students should update their direct deposit bank account information before they graduate or withdraw to be sure they receive their refund.

Housing Deposit

Please see the Housing (p. 24) section for details.

Estimated Expenses

Expenses for students attending the University of Colorado Boulder vary depending on housing (on or off campus), program of study, state residency (tuition classification), personal needs and individual interests.

Tuition and fees are approved annually by the Board of Regents. Visit the Bursar's Office (<https://bursar.colorado.edu>) website for current rates.

The figures below are university-billed cost estimates based on a single undergraduate student enrolled full time for academic year 2017–18 (two semesters). For detailed descriptions of tuition and fees, visit the Bursar's Office (<https://bursar.colorado.edu/tuition-fees/tuition-and-fees-rate-sheets>) website. The difference in range depends upon the student's major. Residential academic program (RAP) fees, program and course fees are not included in the estimated total because costs can vary depending on individual options. Additional costs such as transportation, medical and personal are not charged on the university bill but should be considered for planning purposes. The Office of Financial Aid provides budget examples (<http://www.colorado.edu/financialaid/cost/example-aid>) which may help you plan for other costs.

In-State Expenses (<https://bursar.colorado.edu/tuition-fees/annual-cost-estimate/undergraduate-colorado-resident>) (One academic year; resident for tuition purposes)

Tuition and Fees: \$12,086–\$17,150

On-Campus Room and Board (*based on double occupancy, standard room*): \$13,998

Books and Supplies: \$1,800

On-Campus Estimated Total: \$27,884–\$32,948

Out-of-State Expenses (<https://bursar.colorado.edu/tuition-fees/annual-cost-estimate/undergraduate-nonresident>) (One academic year; nonresident for tuition purposes)

Tuition and Fees: \$36,220–\$39,416

On-Campus Room and Board (*based on double occupancy*): \$13,998

Books and Supplies: \$1,800

On-Campus Estimated Total: \$52,018–\$55,214

International Expenses (One academic year; international nonresident for tuition purposes)

Tuition and Fees: \$37,984–\$41,180

On-Campus Room and Board (*based on double occupancy*): \$13,998

Health Insurance: \$3,990

Books and Supplies: \$1,800

On-Campus Estimated Total: \$57,772–\$60,968

Notes:

- The resident tuition amount assumes eligibility for and authorization for the use of the College Opportunity Fund (COF) stipend, which is \$77 per credit hour in 2017–18.
- Residency classification for tuition is determined by Colorado state law. See the Tuition Classification (p. 27) section.

- Does not include one-time new student fee or mandatory university-sponsored health insurance. See the Health & Wellness (p. 24) section.
- In-state tuition is charged per credit hour. Out-of-state and international tuition is a flat rate, regardless of the number of credit hours.
- In-state undergraduate students must apply for and authorize the College Opportunity Fund tuition stipend to help offset part of their tuition. See the undergraduate Student Finances (p. 118) section.
- In-state undergraduate tuition and mandatory fees (not including course and program fees) are guaranteed for four years. For more information, visit the Bursar's Office's Undergraduate Resident Tuition Guarantee (<https://bursar.colorado.edu/tuition-fees/cu-boulder-tuition-guarantee/undergraduate-resident-tuition-guarantee>) webpage.
- Out-of-state and international undergraduate students are guaranteed the same tuition rate for four years (not including mandatory fees, course and program fees). Students first registering summer 2017 through spring 2018 are guaranteed the same tuition rate through summer 2021. For more information, visit the Bursar's Office's Undergraduate Nonresident Tuition Guarantee (<https://bursar.colorado.edu/tuition-fees/cu-boulder-tuition-guarantee/undergraduate-nonresident-tuition-guarantee>) webpage.
- Students planning to attend summer session can visit the Bursar's Office (<https://bursar.colorado.edu/tuition-fees/tuition-and-fees-rate-sheets/#sum17>) website for summer rates.
- Zero or fractional credit is treated as one hour in assessing tuition and fees. Tuition for no-credit (NC) courses (p. 19) is the same as for courses taken for credit.
- Students simultaneously enrolled in programs leading to two different degrees will be assessed tuition for the college or school with the higher tuition rate.

Bills & Payments

Online Bills

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://bursar.colorado.edu/payments/payment-policies/tuition-fee-agreement-and-disclosure>).

The university bill includes tuition, mandatory fees, course and program fees, optional fees, on-campus room and board (p. 24), residential academic program (RAP) fees, student health insurance (see health insurance requirement (p. 24)) and other direct-university costs for one semester at a time. Textbooks and supplies up to \$1,500 from the CU Book Store can be charged to the bill. Adjustments made throughout the semester will appear immediately on the student account (e.g. health insurance waiver, dropping or adding courses, etc.). Additional costs such as transportation, medical and personal are not charged on the university bill but should be considered for planning purposes.

Bills for fall are available in mid-August. Spring bills are available in mid-January. Emails are sent to students' colorado.edu addresses and to authorized payers. Email is the official means of communication at CU Boulder. Failure to receive an email notification of the bill does not relieve any student of responsibility for payment by the published deadline. Students and authorized payers can log in to MyCUInfo (<https://mycuinfo.colorado.edu>) and CUBill&Pay (<https://quikpayasp.com/cu/boulder/tuition/authorized.do>) at any time to view and pay the bill.

Authorized Payers

Bills are online only. Students access the bill through MyCUInfo. Parents do not automatically have access to see the bill due to federal privacy laws (<http://www.colorado.edu/registrar/students/records/ferpa>). Students must authorize payers (<https://bursar.colorado.edu/billing/cubillpay/parents>) in order to provide them with access to view and pay the bill. Students can authorize up to five people. Authorized payers access the bill through CUBill&Pay. Students are ultimately responsible for payment of the bill.

Authorized payer access is separate and distinct from CU Guest Access. If someone is helping pay tuition and fees on your behalf, we recommend granting both.

Payments

Payment due dates are listed on the bill and on the Bursar's Office (<https://bursar.colorado.edu/billing/due-dates>) website. Payment is due by 5 p.m. Mountain Time on the due date or 11:59 p.m. if paying online. Learn about exceptions for weekends and holidays (<https://bursar.colorado.edu/billing/due-dates/#important>).

Payment Methods

We encourage online payment from a traditional U.S. checking or savings account (electronic check or eCheck) in order to avoid paying a nonrefundable 2.75 percent service fee charged by NelNet Business Solutions for all credit and debit card transactions. Paying by eCheck is secure, fast and free.

We accept American Express, MasterCard, Visa and DISCOVER. A nonrefundable 2.75 percent fee applies to all credit and debit card transactions.

International payments (bank and wire transfers) can be made using Flywire. For more information about Flywire, visit the International Payment (<https://bursar.colorado.edu/payments/payment-methods/international>) webpage.

Learn about other payment methods on the Bursar's Office (<https://bursar.colorado.edu/payments>) website.

Payment Plans

Optional payment plans are available for students and authorized payers to pay tuition and fees over the course of the semester. For more information, visit the Payment Plans (<https://bursar.colorado.edu/payments/payment-plans>) webpage.

Also see the Policies (p. 120) section.

Policies

Add/Drop Tuition Adjustment

Adjustment of tuition and fees is made accordingly based on dates in the Add/Drop Calendar (<http://www.colorado.edu/registrar/students/academic-calendar/add-drop-calendar>).

Credit and Debit Card Service Fee

A nonrefundable 2.75 percent service fee charged by NelNet Business Solutions applies to all credit and debit card transactions. To avoid paying this fee, we encourage payment from a U.S. checking or savings accounts (electronic check or eCheck).

Dispute Rights

To dispute tuition and mandatory fee charges, you must make a formal appeal to the Tuition Dispute Committee by the end of the semester (last day of finals). Disputes will only be considered under extenuating circumstances, such as university error, recent medical condition, immediate family emergency, recent unanticipated financial problems and verified nonattendance. Official documentation must be provided to substantiate the circumstances. Complete a tuition dispute form and return the form, your statement and official documentation to the Bursar's Office Student Billing Department, Regent Administrative Center, 43 UCB, Boulder, CO 80309-0043, 303-492-5381 or bursar@colorado.edu. If you disagree with the charges and fail to avail yourself of the dispute process by the end of the semester, you will have been deemed to have waived your right to dispute the charges. For additional information on the dispute process, see Tuition Dispute (<https://bursar.colorado.edu/billing/tuition-dispute>).

Failure to Make Payment

Failure to make the required payment in accordance with the scheduled payment deadline may result in any or all of the actions described below.

A financial hold may be placed on your student record and remain until the balance is paid in full. You will not be able to:

- Adjust your current schedule (drop or add classes).
- Register for future classes.
- Receive transcripts.
- Receive a diploma or certification materials.
- Be re-admitted.

A late payment charge is assessed once per semester based on the amount due:

Balance Due	Late Charge
\$1.00–99.99	\$5
\$100.00–299.99	\$10
\$300.00–499.99	\$20
\$500.00–699.99	\$30
\$700.00–899.99	\$40
\$900.00 and over	\$50

In addition, finance charges of one percent (1%) per month are assessed on the unpaid principal balance. Finance charges are calculated by applying the periodic rate of one percent (1%) per month (annual percentage rate of 12%) to the unpaid principal balance less any payments or credits made.

After the end of the semester, past due accounts are referred to the university's Student Debt Management department for collection. Students will have an opportunity to establish a university-approved repayment agreement. Establishing a repayment agreement does not result in release of financial holds.

If the balance is not paid or a university-approved repayment agreement does not exist after six months, Colorado law requires the university to place all delinquent accounts with a private collection agency at which time the delinquency is reported to national credit bureaus.

Student accounts referred to an outside collection agency may incur collection agency costs, expenses and fees. Such collection costs, expenses and fees may include percentage-based fees charged to the

university by the collection agency, including percentage-based fees of up to 30 percent of the debt collected. Any collection costs stated above are charged in addition to the principal, fees and interest due on the student's account. The student may be responsible for reasonable attorneys' fees and court costs associated with collecting or enforcing payment on the past due account as allowed under Colorado law. Pursuant to Colorado Revised Statutes § 23-5-115, in the event the student defaults on the amount owed to the university, the university may certify to the Colorado Department of Revenue information required for the recovery of past due debt.

Nondegree Students

Nondegree students enrolled in undergraduate courses are assessed tuition at the undergraduate student rate. Nondegree students enrolled in graduate courses are assessed tuition at the graduate student rate. Nondegree students enrolled in both graduate and undergraduate courses are assessed tuition at the undergraduate student rate.

Returned Payments

A \$20 fee is charged for all payments returned due to insufficient funds, closed account, or payment stopped (regardless of the amount). A \$30 fee is charged by NelNet Business Solutions for returned payment plan payments. In addition, late and finance charges may be assessed and certified funds may be required when you make payment. A financial hold may also be placed on your account and you may be liable for collection costs and attorneys' fees as allowed by Colorado laws.

Payments are most often returned because deposits have been held. To avoid charges and penalties, call your bank to guarantee availability of funds.

Students Registered on More than One Campus

Students registering for courses on more than one campus of the university during a single semester pay tuition and fees to each campus at the rate appropriate to the number of credits for which they are registered on that campus. Students may be eligible to use the concurrent registration option, in which case they pay the tuition rate of their home campus for the total hours enrolled at all campuses.

Tuition and Fee Agreement and Disclosure

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://bursar.colorado.edu/payments/payment-policies/tuition-fee-agreement-and-disclosure>).

Tuition Classification

Students are classified as residents, nonresidents or international nonresidents for tuition purposes on the basis of answers provided on their application for admission and other relevant information. For more information, go to Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>).

Withdrawal Policy Regarding Tuition and Fees

Students who pay the \$200 confirmation deposit and register for classes for any given semester are obligated to pay full tuition and fees for that semester, unless they officially withdraw from the university by published deadlines.

Tuition and fee obligations for students withdrawing from fall or spring semesters:

- Continuing students: Students who withdraw during the full-refund periods will have their confirmation deposit refunded unless there are any outstanding charges.
- New and readmitted students: New, readmitted and transfer students are not eligible for a refund of the confirmation deposit.

Deadlines to withdraw with no financial penalty vary by semester but occur about ten days before the first day of instruction. For the current refund and assessment schedule, visit the Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

If students withdraw after the deadline to withdraw without being assessed a financial penalty, but before 11:59 p.m. on the third Wednesday of instruction, they are assessed a \$200 withdrawal processing fee. The confirmation deposit is automatically credited toward the withdrawal fee.

After the third Wednesday of instruction (the first drop deadline), there are three additional assessment periods.

- From the third Wednesday of instruction through the fifth Wednesday, students will be charged 40 percent of total tuition (not including the portion of tuition paid by College Opportunity Fund (COF) for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the fifth Wednesday of instruction through the seventh Wednesday, students will be charged 60 percent of total tuition (not including the portion of tuition paid by COF for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the seventh Wednesday of instruction, tuition will not be adjusted. In the case of extenuating circumstances (university error, recent medical condition, immediate family emergency, recent unanticipated financial problems or verification of non-attendance), students may dispute tuition and mandatory fee charges through the Bursar's Office. COF credit hours are expended and not refunded for withdrawals after the published deadline.

To comply with federal financial aid regulations, financial aid recipients' loan and scholarship awards may be adjusted.

Students should visit the Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage for the most recent information, as the Board of Regents reserves the right to revise this schedule at any time. Refer to the Summer Session (<http://www.colorado.edu/summer>) website for information on the withdrawal policy and refund schedule for summer terms.

Students who do not pay the full amount due the university at the time of withdrawal must make arrangements for payment with the Student Debt Management department in the Bursar's Office. All withdrawals are handled through the Office of the Registrar.

Colleges & Schools

Arts & Sciences

The College of Arts & Sciences is the liberal arts college at CU Boulder. Its mission is to provide an outstanding liberal arts education for its undergraduates, cutting-edge graduate education and world-class research, scholarship and creative work. In addition to gaining the knowledge and skills of their areas of study, students learn how new

information is acquired and can participate in original research and creative work with individual faculty members.

The college offers a wide variety of fields of study, with nearly 50 undergraduate majors. The environment and advantages of a small liberal arts college are created through "academic neighborhoods" in which students can meet and interact with other students and faculty in small group settings. In addition, more than 60 percent of undergraduate classes are small, with 25 or fewer students.

As the liberal arts college of CU Boulder, the College of Arts and Sciences has several goals in the education of its students:

- Educate students for careers and a productive life. Arts and sciences students gain the most current knowledge and skills in their major fields of study. In addition, they learn how to acquire new skills to contend with-and lead-the changes that will occur in the decades to come. Education for a productive life also requires that students learn how to analyze situations, solve problems and speak and write effectively.
- Provide students with a well-rounded education. Arts and sciences students acquire a broad knowledge and an integrated understanding of art and music, great literary works, philosophy, history and politics, the social world, science and technology. They learn how to critically evaluate and think about morals, ethics and values. The core curriculum and breadth requirements give students a broad, liberal-arts education that develops the whole person, not just the specialist.
- Educate citizens who can think for themselves, understand the rapidly changing world and make wise choices within a democratic system.
- Impart a love of learning so that students can continue to grow throughout life.
- Teach ways of thinking about and approaching new problems. For some students, this will enable them to further advance knowledge and scholarship in the academy. For all students, this is important for enriching their lives.
- Prepare students to help enrich the lives of others. Arts and sciences graduates become lifelong resources for their families, neighbors, friends and co-workers.

The college is also dedicated to outstanding graduate education. Advanced degrees are offered by nearly every academic department in the college, and the PhD is offered in approximately 30 different disciplines. In addition, an increasing number of departments offer combined bachelor's/master's degrees that can be earned in five years. Graduate training focuses on teaching and research careers as well as on professional careers in the public and private sector.

The strength of the College of Arts and Sciences comes from its outstanding faculty. In addition to being dedicated teachers, they are active scholars in disciplines throughout the arts and humanities, social and behavioral sciences, biological sciences and physical and mathematical sciences. They are the recipients of numerous national awards and honors for their research, scholarship and creative work. Faculty and staff of the College of Arts and Sciences join together to create an intellectual community of students and scholars to discover, critically examine, integrate, preserve and transmit knowledge, wisdom and values.

Honors Program

The Arts and Sciences Honors Program provides a community for highly motivated and academically prepared undergraduate students and

offers opportunities for intellectual engagement through honors courses, academic-inspired events, and honors thesis research and creative work.

The Honors Program is a program of excellence in which the best teaching faculty are committed to serving the most highly motivated students. The Honors Program offers the opportunity to work closely with faculty, to engage with other honors students (<http://www.colorado.edu/honors/community>) and to write an honors thesis. Honors offers over 50 courses per year (<http://www.colorado.edu/honors/courses>) in a wide variety of areas. Honors courses are limited to an enrollment of approximately 17 students.

Incoming first-year students are invited to participate (<http://www.colorado.edu/honors/admission>) in the Honors Program based on multiple criteria that are set by the Office of Admissions. Transfer students must have a 3.3 GPA or better from their previous school. Currently enrolled students are eligible based on their academic achievement at CU Boulder and are expected to have a 3.3 GPA or better.

Latin honors (<http://www.colorado.edu/honors/graduation>) in the College of Arts and Sciences are conferred by the Honors Program. Students who wish to graduate *cum laude*, *magna cum laude* or *summa cum laude* must write and defend an honors thesis and maintain a certain GPA. Most students pursue Latin honors in their major (based on departmental requirements), but students may also pursue General Honors (<http://www.colorado.edu/honors/generalhonors>) via the Honors Program, providing students the opportunity to write an interdisciplinary thesis.

The Honors Residential Academic Program (Honors RAP (<http://www.colorado.edu/hrap>)) is the optional residential component of the program. Honors RAP is open to a limited number of qualified incoming and continuing students. Students engage in small classes and co-curricular activities, forming an academic community in their residence hall.

Miramontes Arts and Sciences Program

The Miramontes Arts and Sciences Program (MASP) is a community of diverse scholars dedicated to academic achievement. MASP accepts highly motivated students with strong academic records who are also members of traditionally underrepresented groups and/or are first-generation college students. MASP supports students through mentoring, instruction, skills workshops, enrichment opportunities, community activities, and participation scholarships.

For most members of MASP, support begins the summer before freshman year with the Program for Excellence in Academics and Community (PEAC), a summer residential program that helps first year students transition to the University. PEAC is an intensive and challenging academic program where students take a rigorous set of non-credit classes, learn valuable skills for academic success, are introduced to resources and opportunities on campus and in the College of Arts & Sciences, and participate in advanced enrichment and community-building activities. Continuing students interested in MASP can also apply through our MASP affiliate program.

Students receiving a participation scholarship in MASP commit to participating in a range of programming that include one-credit hour seminars on unique and advanced topics in Arts & Sciences, research colloquia where they meet and network with faculty members, skills workshops, and community conversations. Students are encouraged to participate in undergraduate research and/or other scholarly activities such as internships and study abroad programs. MASP students are also required to be involved with our community space and to

participate in community activities to help develop a strong sense of group cohesiveness and spirit. And MORE!

For more information, call the MASP office at **303-492-8229**.

Policies & Requirements

Academic Excellence

Dean's List

Students in the College of Arts and Sciences who have completed at least 12 credit hours of CU Boulder course work for a letter grade in any single semester with a term GPA of 3.75 or better are included on the dean's list and receive a notation on their transcript and a letter from the dean.

Graduation with Honors

The award of honors at graduation—cum laude, magna cum laude or summa cum laude—is determined by the Honors Program of the college and is based on several criteria, including the quality of original scholarly work. Honors are not conferred on a graduate simply by virtue of high grades. Students pursuing multiple majors or multiple degrees must complete their honors program and defend their thesis by the published deadline for the term/year in which their first major or first degree is conferred. Students intending to pursue honors must register with the Honors Program by the deadlines published on the Honors Program website. Honors requirements must be complete prior to graduation. Students "walking" in May but graduating in August must complete honors requirements, including defending the thesis, by the Honors Program deadline for May graduation. Interested students should consult the Honors Program listing in this catalog or contact the Honors Program in Norlin Library.

Graduation with Distinction

Students will graduate "With Distinction" if they have at least 30 credit hours completed at the University of Colorado Boulder and have a grade point average of 3.75 or higher for all course work completed at the University of Colorado. The average includes all grades except P.

Phi Beta Kappa

Phi Beta Kappa is the nation's oldest and most prestigious honor society. The CU Boulder chapter was established in 1904. Upper-division students whose undergraduate academic records fulfill certain requirements are eligible for election to membership in recognition of outstanding scholastic achievement in the liberal arts and sciences. Students are notified by mail of their nomination; students do not apply for Phi Beta Kappa membership.

Academic Standards

Good Academic Standing

Good academic standing in the college requires a cumulative grade point average of 2.00 (C) or above in all University of Colorado work. Grades earned at another institution are not used in calculating the grade point average at the University of Colorado (this includes courses taken at Metropolitan State University on the Denver campus). However, grades earned in another school or college within the University of Colorado system are used in determining a student's scholastic standing and progress toward the degree in the College of Arts and Sciences.

Academic Alerts

Students who complete their first semester on campus, whether they are a freshman or a new transfer student, with a grade point average that is

below 2.00 are placed on academic alert. Academic alert is a warning. Students on academic alert who earn a term grade point average of 2.00 or higher during their alert semester are allowed a second semester to achieve the required cumulative grade point average of at least a 2.00. Students who earn below a 2.00 term grade point average during their alert semester will be suspended.

Academic Probation

Continuing students whose cumulative grade point average falls below 2.00 are placed on probation. Those students who enroll in any term in the calendar year, excluding summers, after being placed on probation are expected to raise their grade point to a 2.00 or above overall by the end of that term. Neither CU-Boulder's summer session (including Maymester and Augmester) nor enrollment through Boulder evening courses counts as a probationary semester. Students are not dismissed at the end of the summer term.

Students placed on academic probation who elect to remain out of school for a full calendar year can return to the university with a two-semester window to achieve the required cumulative GPA of 2.00 or above. Students on probation who return after a hiatus of one year are placed on a second probation at the end of the semester in which they return if their cumulative grade-point average remains below 2.00 and are dismissed from the university if they do not achieve a minimum 2.00 cumulative grade-point average by the end of the semester following the imposition of the second probation.

Scholastic Suspension

Continuing students who still have a cumulative average below 2.00 after their semester of probation will be suspended and will not be able to register for University of Colorado daytime courses on any campus during any academic year, August to May. Students suspended from the college are eligible for readmission when they have achieved a cumulative 2.00 average by virtue of work done during the University of Colorado's summer term (any of the three campuses) and/or through the Division of Continuing Education and Professional Studies (Boulder evening or correspondence courses). Students who choose to enroll in continuing education courses to restore their good standing must maintain a 2.50 GPA or above in each term in continuing education or be suspended from both day classes and continuing education classes. They also may return as transfer students when they have overcome their deficiencies by enrolling at another institution (i.e., by achieving an overall 2.00 average in the University of Colorado work plus all work taken elsewhere since dismissal). These transfer grades are used only for the purpose of readmission and do not remain in the University of Colorado cumulative grade-point average. Suspended students pursuing this latter option have two semesters after readmission to bring their University of Colorado grade point average up to 2.00 or they are suspended again.

Academic Ethics

A university's intellectual reputation depends on the maintenance of the highest standards of intellectual honesty. Commitment to those standards is a responsibility of every student and faculty member at the University of Colorado. Cheating; plagiarism; illegal possession and distribution of examinations or answers to specific questions; alterations, forgery or falsification of official records; presenting someone else's work as one's own; or performing work or taking an examination for another student are examples of acts that may lead to suspension or expulsion. Reported acts of academic dishonesty must be referred to the Honor Council. The policies and procedures governing acts of academic

dishonesty can be found on the Web at honorcode.colorado.edu (<https://honorcode.colorado.edu>).

Policy on Grade Appeals

The following shall be the official policy of the academic units of the College, unless an academic unit submits an alternative procedure to the Dean for approval.

When a student believes that a grade has been improperly assigned, and discussions between the instructor and the student have not led to any resolution of the problem,

1. The student shall have the option of making a formal written appeal to the Department Chair. The appeal must specify the remedy desired by the student, and it must be submitted within 45 days of the end of the academic term in which the course was taken.
2. The Chair or designee will meet (together or separately) with the student and with the faculty member who taught the course. If the Chair/designee is unable to broker a solution mutually acceptable to both student and instructor, then
3. The Chair shall appoint an ad hoc Grade Appeals Committee, which will review the dispute. This Committee shall consist of at least three impartial faculty members competent in the subject matter of the course in question. The Chair will provide the Committee with the student's appeal and a written response from the faculty member.
4. Within 45 days, the Committee will submit a report and recommendation to the Chair, and the Chair will recommend to the instructor either (1) that the originally assigned grade stand; or (2) that a new grade be assigned.
5. In cases where a change of grade is recommended and the instructor does not wish to accept the recommendation of his/her colleagues, the Chair shall forward the written materials associated with the appeal to the Dean of the College.

Policy on Waiver of Degree Requirements

The College of Arts and Sciences does not waive degree requirements or excuse students from completing degree requirements. Petitions for exceptions to the academic policies stated here may be submitted to the Appeals Committee on Academic Rules and Policies. Such petitions will be considered only if they meet all three of the following conditions:

1. The student must document that she/he has made every effort to fulfill the policy or requirement as defined and must demonstrate that no other options exist for fulfilling the requirement as defined in this catalog.
2. The student must document that she/he is prevented from fulfilling the policy or meeting the requirement as defined here for compelling reasons beyond the student's control.
3. The student must demonstrate to the satisfaction of the faculty committee that she/he has fulfilled or will fulfill the intent of the policy or the requirement through an appropriate alternative.

Students who believe that their circumstances meet the conditions to submit a petition must first consult with their academic advisor. If the advisor offers options for meeting the requirement or policy as defined here, the student must pursue those options and should not submit a petition.

The Appeals Committee on Academic Rules and Policies is located in the Office of Academic and Curricular Affairs.

Credit and Enrollment

Transfer Credit

Work from another accredited institution of higher education that has been completed with a grade of C- (1.70) or better may be transferred to the University of Colorado. Categories of transfer course work not accepted by the university are described in the undergraduate Transfer of College-Level Credit (p. 111) section.

All courses transferred from junior and community colleges carry lower-division credit. Courses transferred from four-year institutions generally carry credits at the level at which they were taught at the previous institution, but can be subject to review on a course-by-course basis.

Colorado Student Bill of Rights

In the interests of promoting timely graduation and facilitating the transfer of students among the institutions of higher education in the state of Colorado, the College of Arts and Sciences and the University of Colorado Boulder adhere to the Student Bill of Rights as presented in Colorado Statute 23-1-125.

23-1-125. Commission directive - student bill of rights - degree requirements - implementation of core courses - competency test - prior learning

Student bill of rights. The general assembly hereby finds that students enrolled in public institutions of higher education shall have the following rights:

1. Students should be able to complete their associate of arts and associate of science degree programs in no more than sixty credit hours or their baccalaureate programs in no more than one hundred twenty credit hours unless there are additional degree requirements recognized by the commission;
2. A student can sign a two-year or four-year graduation agreement that formalizes a plan for that student to obtain a degree in two or four years, unless there are additional degree requirements recognized by the commission;
3. Students have a right to clear and concise information concerning which courses must be completed successfully to complete their degrees;
4. Students have a right to know which courses are transferable among the state public two-year and four-year institutions of higher education;
5. Students, upon completion of core general education courses, regardless of the delivery method, should have those courses satisfy the core course requirements of all Colorado public institutions of higher education;
6. Students have a right to know if courses from one or more public higher education institutions satisfy the student's degree requirements;
7. A student's credit for the completion of the core requirements and core courses shall not expire for ten years from the date of initial enrollment and shall be transferrable.

Statewide Guaranteed Transfer of General Education Courses

As of fall 2003, the two-year and four-year transfer articulation agreements among Colorado institutions of higher education were replaced by a statewide guaranteed transfer of approved general education courses taken at any Colorado public institution of higher

education. Under the statewide guaranteed transfer program, up to 31-33 credits of successfully (C- or better) completed course work will automatically transfer and apply towards graduation requirements at the receiving institution. The course work must be drawn from the list of approved guaranteed transfer courses and must meet the distribution requirements of the guaranteed transfer program. Further information about the statewide transfer program, including the list of approved courses and distribution requirements, can be found at the website of the Colorado Department of Higher Education, higher.ed.colorado.gov/Academics/Transfers/Students.html (<http://higher.ed.colorado.gov/Academics/Transfers/Students.html>).

As of fall 2006, a student graduating with an associate of arts or an associate of science degree from a Colorado community college and entering the College of Arts and Sciences is exempt from the written communication requirement and the lower-division component of the core curriculum. Note that students are still subject to the MAPS requirement. Additional information on the evaluation of transfer credit of Colorado community college course work and its application in select arts and sciences major programs can also be found at the Arts & Sciences Prospective Students (<http://www.colorado.edu/artsandsciences/student-resources/prospective-students>) webpage.

Students are required to follow the graduation requirements listed in this catalog at the time of their initial entry onto the Boulder campus.

Attendance

Successful work in the College of Arts and Sciences is dependent upon regular attendance in all classes. Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Failure to attend regularly may result in receipt of an F in a course. Students who, for illness or other legitimate reason, miss a final examination must notify the instructor or the Academic Advising Center no later than the end of the day on which the examination is given. Failure to do so may result in receipt of an F in the course.

Credit Policies

Advanced Placement Program

See Undergraduate Admission (p. 97) and the Advanced Placement Table (p. 106).

International Baccalaureate

Any student admitted to a University of Colorado campus after June 30, 2003, who has graduated from high school having successfully completed an International Baccalaureate (IB) diploma, program will be granted 24 credit hours of college credit. No tuition will be charged for these credits. These credits will be granted, however, only if the student receives a score of 4 or better on an examination administered as part of the IB diploma program.

In addition, college credit is granted for International Baccalaureate examinations at the higher level with a score of 4 or better. For specific equivalencies, contact the Office of Admissions at 303-492-2458 or visit www.ibo.org (<http://www.ibo.org>).

College-Level Examination Program (CLEP)

The College of Arts and Sciences accepts a limited number of hours of CLEP credit from subject (not general) examinations toward its bachelor's degree programs (see Undergraduate Admission for subjects accepted). In addition, certain CLEP examinations may be used to meet the minimum academic preparation standards (MAPS) for admission to the university. No more than 30 total credit hours of CLEP will apply,

nor may CLEP credit be used in the final 30 credit hours presented for a degree.

CLEP tests are administered through Career Services, 303-492-5854.

Cooperative Education/Internships

Students in the College of Arts and Sciences may receive up to nine credit hours for a department-sponsored cooperative education program or internship. A maximum of six of the nine internship credits can be taken in the same department. Each internship project must be approved by the chair or associate chair of the department awarding the credit before the student enrolls in the course in order for the student to receive credit. Students are encouraged to contact their major department office or Career Services for information regarding the possibility of enrolling in a cooperative education program in their major. Many internships are graded on a pass/fail basis only. Participation in an internship with mandatory pass/fail grading does not affect the total credit hours of pass/fail a student may apply toward a degree. Some departments further restrict the use of internship credit toward meeting major requirements.

For further information on internship credit, visit advising.colorado.edu (<http://advising.colorado.edu>).

Credit/No Credit

Credit/no credit changes must occur during the schedule adjustment periods.

Credit Taken as a Nondegree Student

Once a student has been admitted to a degree program, credits from the Division of Continuing Education such as ACCESS, Boulder evening credit courses and CU Boulder correspondence classes may be eligible to be applied toward the degree. Students will receive initial advising during orientation once they have been accepted to a degree program in the College of Arts and Sciences.

Credit Taken Outside the College of Arts and Sciences

Students may apply a total of 30 credit hours from the other colleges and schools at CU Boulder as well as specified ROTC and President's Leadership Class courses toward the fulfillment of requirements for the BA and BFA degrees. Within these 30 total credit hours, up to eight credit hours in activities courses (applied music and ensembles) may be used. Transferred courses that were taught by departments considered to be outside the College of Arts and Sciences are counted as part of the allowed 30 credit hours. If a course has been approved to meet a core curriculum requirement and the course is taught outside the College of Arts and Sciences, the credit for this course will not be included as part of the 30 semester hour limitation.

Cross-Listed Courses

Courses that are cross-listed in two or more departments are credited in the department in which the student has the most credit hours, irrespective of the department in which the student formally enrolled for the course.

Foreign Language Courses

Students must receive a grade of C or better to enroll in the next level of a language sequence in Arabic, Chinese, Farsi, Hindi, Indonesian, Japanese and Korean. Students must receive a grade of C- or better to enroll in the next level of a language sequence in American Sign Language, Danish, Finnish, French, German, Greek, Hebrew, Italian, Latin, Norwegian, Portuguese, Russian, Spanish and Swedish. Students will not receive credit for a lower level course after credit has been given for a higher level course in the same sequence. For example, students who have passed

a 2000-level class will not receive credit for a 1000-level class in the same sequence. This rule applies to the following languages: American Sign Language, Arabic, Chinese, Farsi, French, German, Greek, Hebrew, Hindi, Indonesian, Italian, Japanese, Korean, Latin, Norwegian, Polish, Portuguese, Russian, Spanish and Swedish. Consult each department for specific restrictions, requirements and prerequisites.

Undergraduate introductory language courses (numbered at the 1000 and 2000 level) are designed for non-native speakers. Fluent speakers of a language are prohibited from enrolling in introductory courses in the language and can be dropped from these courses by the department or by the course instructor. Fluent speakers should consult the department website and this catalog or consult with the course instructor or department language coordinator about eligibility to enroll in upper-division language courses (numbered at the 3000 and 4000 level) before enrolling in such courses. Departments can exclude fluent speakers from upper-division language courses based on course content and/or instructional resources. Speakers who have not formally studied the language but have spoken the language in their home should consult with the associate chair of the language department or the department language coordinator about appropriate placement before enrolling in a language course.

Some classes offered by foreign language departments are taught in English and require no knowledge of foreign language. Read specific course descriptions and check with the departments.

Incomplete Grades

An I grade is given at the discretion of the course instructor only when a student has satisfactorily completed a substantial portion of a course and, for reasons beyond the student's control, is prevented from completing all work for the course within the term. Incomplete grades must be requested by the student and should not be awarded by the instructor for non-attendance. (In the case of non-attendance, the instructor should award the student the grade(s) earned.) If an incomplete grade is given, the instructor is required to document the reasons/grounds for the awarding of the incomplete grade, the specific work and conditions for completion of the course and the time frame within which the course work must be completed. The maximum time the instructor can allow for the completion of the course work and subsequent award of a course grade is one year from the end of the term the course was taken. After one year, if no final grade is awarded, the I will change to the grade of F. A copy of the Incomplete Agreement (forms are available from the dean's office) signed by the student and instructor and accompanied by documentation of the extenuating circumstances that resulted in the awarding of an incomplete should be filed with the Assistant Dean's Office and with the instructor's department office, and a copy should be given to the student.

Independent Learning

A maximum of 30 credit hours of correspondence/online learning work may count toward the degree. Arts and sciences courses offered by the CU Boulder Division of Continuing Education carry resident credit.

Independent Study

With departmental approval, students may register for independent study during the normal registration periods for each semester. Students may not register for more than 6 credit hours of independent study credit during any term. No more than 8 credit hours of independent study taken in a single department or program can be applied toward the total credit hours needed for graduation. A maximum of 16 credit

hours of independent study may count toward the degree. The minimum expectation for each hour of credit is 25 hours of work.

A student may not use independent study projects to fulfill the college's general education requirements. Some departments further restrict the use of independent study hours toward meeting major requirements.

Required Credit Hours Outside the Major

To complete the BA degree, students are required to complete a minimum of 75 credit hours outside their major department. Exceptions are:

- Students who complete designated departmental honors courses in their major and/or in honors thesis credit can reduce the 75 credit hours required outside the major department by a corresponding number of credits, up to a maximum of six.
- Students completing the bachelor of fine arts degree must complete a minimum of 53 credit hours outside of their major department.

Pass/Fail

Students in the College of Arts and Sciences may not use the pass/fail option for courses taken to fulfill general education (core) requirements, courses used to satisfy the foreign language requirement, courses used to fulfill the Minimum Academic Preparation Standards (MAPS), courses used to complete minor requirements or courses used to complete the minimum requirements for the major. A grade of F when earned in a course taken pass/fail will calculate into the GPA as a failing grade.

Students may take elective courses pass/fail, to a maximum of 6 credit hours. Courses offered only on a mandatory pass/fail basis are excluded from the maximum allowed. The pass/fail option may be used only for elective credit.

Repetition of Courses

If a student takes a course for credit more than once, all grades are calculated into the grade point average. However, the course is only counted toward graduation once, unless a course description specifically states that it can be taken more than once for credit.

ROTC Credit

The ROTC courses listed below have been certified as acceptable college-level course work by the faculty of the College of Arts and Sciences or by other colleges and schools on the Boulder campus. These courses are counted as elective credit toward the degree, subject to the 30-credit-hour limitation on course work taken outside the college for students in the BA and BFA programs. Courses not included on this list do not count toward any degree requirements. Transfer ROTC course work must be evaluated as equivalent to course work on this list to count toward degree requirements.

AIRR 3010 & AIRR 3020	Air Force Leadership Studies I and Air Force Leadership Studies II	6
AIRR 4010 & AIRR 4020	National Security Affairs/Preparation for Active Duty and National Security Forces in Contemporary American Society 2	6
MILR 1011 & MILR 1021	Adventures in Leadership 1 and Adventures in Leadership 2	4
MILR 2031 & MILR 2041	Methods of Leadership and Management 1 and Methods of Leadership and Management 2	6
MILR 4072 & MILR 4082	Leadership 1: Adaptive Leadership and Leadership 2: Leadership in a Complex World	6
NAVR 2020	Seapower and Maritime Affairs	3

NAVR 3030	Naval Engineering Systems	3
NAVR 3040	Weapons and Systems Analysis	3
NAVR 3101	Evolution of Warfare	3
NAVR 4010 & NAVR 4020	Leadership and Management and Leadership and Ethics	6
NAVR 4030	Navigation	3
NAVR 4101	Amphibious Warfare	3

Withdrawal

For specific withdrawal procedures and campus-wide policies, see the Withdrawal (p. 22) section.

Students in the College of Arts and Sciences who withdraw two semesters in a row will have a dean's stop placed on their registration. Summer session is not counted as a regular semester. They will not be permitted to return to CU Boulder before one full academic year has elapsed (not including their semester of withdrawal). Arts and sciences students may withdraw from all classes for a term until the last day that classes are taught by requesting withdrawal in the Office of the Registrar. Students cannot withdraw after classes have ended for a term.

These policies also apply to arts and sciences students who are enrolled in continuing education courses.

Readmission

Arts and sciences students who request readmission to the college are always readmitted to their major of record at the time they last attended the university. Readmitted students who desire to pursue a major different from their major of record must follow the college's process for declaring a new major (explained on the Academic Advising Center (<http://www.colorado.edu/artssciences/aacforstudents>) website) after they have been readmitted.

Requirements

Students are subject to the general degree requirements in effect at the time they first enter the Boulder campus of the University of Colorado and are subject to the major requirements in force at the time they declare the major. Arts and sciences students have 10 years to complete the requirements for a declared major. If the 10-year limit is exceeded, the student may be required to satisfy current major requirements. Students pursuing a major degree program identified for discontinuation by decision of the Board of Regents and the Colorado Commission on Higher Education have four years from the formal announcement of discontinuation to complete the degree program and graduate. The requirements, rules and policies stated here apply to all students first entering the Boulder campus during the 2014–15 academic year.

Students must complete a degree within 10 years. If it has been more than 10 years since matriculation into the College of Arts and Sciences and no degree has been completed, students may be subject to new curricula in place at the time of reenrollment. Please see the Minimum Major Requirements section for additional information on major requirements. Students may contact the Academic Advising Center for further assistance.

Academic Advising

Students in the college are expected to assume responsibility for planning their academic program in conjunction with their academic advisor in accordance with college rules and policies and with departmental major requirements. Any questions concerning these

provisions are to be directed to the student's academic advisor or to the Academic Advising Center.

The college cannot assume responsibility for problems resulting from students failing to follow the policies stated in the catalog or from incorrect advice given by someone other than an appropriate staff member of the college.

Advising

Academic advising is an integral part of undergraduate education.

Academic Advisors are professional staff members who guide students to identify, develop, pursue and attain meaningful educational and personal goals. Advising is more than the sharing of information about academic courses and programs. Students are ultimately responsible for choosing appropriate courses, for registering accurately and for meeting all degree requirements. However, academic advisors have an expertise in navigating the entire curriculum, which helps them to personalize students' academic experiences and ensure the integrity of a liberal arts education.

Center for First-Year Students

All new first-year students entering the college are advised in the Center for First-year Students, where they receive assistance in making a successful transition to the Boulder campus, are oriented to the academic expectations of the college and are supported in confirming their choice of major or in selecting an appropriate major.

In addition, through the Center for First-year Students, the Academic Advising Center provides comprehensive advising services to students who are undecided about their major or who are thinking of changing their major to another CU Boulder college or school.

Advising Beyond the First Year

All students who have confirmed their major of choice by the end of their first year are advised during their second year and beyond by professional advisors in their disciplinary area.

Preprofessional Advising Program

The advising center also provides preprofessional advising for all students who are preparing to pursue the study of law, medicine or other professional health fields. The Preprofessional Advising Program provides in-depth individual advising on preparation for these professional programs, provides workshops to prepare students for the application process and offers guidance in arranging professional internships and shadowing opportunities.

Responsibilities of Students and Advisors

Within the advising system on the Boulder campus, both students and advisors have responsibilities.

Students are responsible for:

- knowing the requirements of their particular academic program, selecting courses that meet those requirements in an appropriate time frame, registering accurately and monitoring their progress toward graduation;
- consulting with their academic advisor regularly throughout their academic career, so as to avoid seeking advising only during busy registration periods;
- being prepared for advising sessions (for example, by bringing in a list of questions or concerns, having a tentative schedule in mind and/or being prepared to discuss interests and goals with their advisor);
- knowing and adhering to published academic deadlines;

- monitoring their position on registration waitlists; and
- reading their CU email on a weekly basis.

Advisors are responsible for:

- helping students clarify their values, goals and abilities;
- helping students understand the nature and purpose of a college education;
- providing accurate information about educational options, requirements, policies and procedures;
- helping students plan educational programs consistent with the requirements of their degree program and with their goals, interests and abilities;
- assisting students in the continual monitoring and evaluation of their educational progress; and
- helping students locate and integrate the many resources of the university to meet their unique educational needs and aspirations.

Four-Year Graduation

The College of Arts and Sciences has adopted a set of guidelines to define the conditions under which a student should expect to graduate in four years. More information is available through the Academic Advising Center and major program and departmental offices.

The University of Colorado Boulder guarantees that if the scheduling of essential courses is found to have prevented a student in the College of Arts and Sciences from completing all course work necessary for a BA or BFA degree from the university by the end of the student's eighth consecutive fall and spring semester, the college will provide tuition plus any course fees for all courses required for completion of the degree requirements. Students must satisfy all the conditions described below to be eligible for this guarantee.

This guarantee extends to all students who enrolled the summer of 1994 or after into the College of Arts and Sciences as first-semester freshmen without MAPS deficiencies and who satisfy all the requirements described below. This guarantee cannot be extended to include completion of a second major, a double degree, a minor, a teaching certificate or other certificate program. Some CU Boulder study abroad programs may not provide a sufficient range of courses to allow students to meet the requirements and thus students who participate in study abroad are not included in this guarantee.

Four-Year Guarantee Requirements

1. Students should enroll in University of Colorado Boulder course work for eight consecutive fall and spring semesters.
2. No fewer than 60 credit hours of applicable course work should be completed with passing grades by the end of the second year (24 calendar months), 90 credit hours by the end of the third year (36 calendar months) and 120 credit hours by the end of the fourth year. Students should enroll in and pass an average of 15 credit hours each semester.
3. A minimum of 30 credit hours of college core-curriculum courses should be completed by the end of the second year, including college core-curriculum courses that also meet major requirements. All remaining college core-curriculum requirements must be fulfilled by the end of the eighth semester.
4. Students should complete 45 upper-division credit hours by the end of the eighth semester of study.
5. A GPA of at least 2.00 must be earned each semester.

6. Grades of C- or better in all course work required for the major should be earned, and students should have a cumulative GPA of 2.00 in all major course work attempted.
7. A recommended plan of study must be started toward the major no later than the start of the second semester of study (see note below for exceptions) and thereafter students must make adequate progress toward completing the major (defined by each major). A statement of adequate progress is available from the major or departmental office at the time the major is declared.
8. The major must be declared no later than the start of the second semester of study (see note below for exceptions), and students must remain in that major until graduation.
9. Students should meet with their assigned primary advisor each semester.
10. Students must register each semester within one week of the assigned registration time.
11. Students should avoid taking courses that are in conflict with the written advice of their assigned primary advisor.
12. Students should adhere to the General Credit and Enrollment Policies and Minimum Major Requirements listed in the Arts and Sciences section.
13. Courses in conflict with major or college core curriculum requirements should be avoided.
14. The student should apply online to graduate no later than the beginning of the seventh semester of study (see Graduation Deadlines section).
15. Documentation should be kept proving that these requirements were satisfied (e.g., records of advising meetings attended, advising records and instructions, etc.).

The recommended plan of study for the following majors must be started in the first semester of study to be eligible for this guarantee: BA in biochemistry; chemistry; ecology and evolutionary biology; Japanese; integrative physiology; molecular, cellular and developmental biology; geology; physics; and all majors that require foreign language course work when student proficiency falls below the entry-level language course of that major. Students seeking a BFA in dance or theatre must start the recommended plan of study for the corresponding BA program in the first semester of study and qualify for admission into the BFA program by the end of the third semester. Students seeking a BFA in film studies or fine arts must start the recommended plan of study for the corresponding BA program in the first semester of study and qualify for admission into the BFA program by the end of the fourth semester. If a student changes majors, the primary advisor, in consultation with the College of Arts and Sciences assistant dean's office, will review the courses taken to date to determine whether the college will continue to extend the four-year guarantee.

Graduation Requirements

Arts and sciences students must fulfill the following requirements for graduation:

1. Pass a total of 120 credit hours.
2. Maintain a 2.00 (C) grade point average in all University of Colorado work and a 2.00 (C) in all major course work attempted. (Some majors may require a higher minimum grade point average.)
3. Pass 45 credit hours of upper-division work (courses numbered in the 3000s and 4000s).
4. Arts and sciences students must complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus.

Of these 45 credit hours, a minimum of 30 credit hours must be in arts and sciences upper-division credit hours completed as a matriculated student in the College of Arts and Sciences at the University of Colorado Boulder and at least 12 of these upper-division credit hours must be in the major. A maximum of 6 credit hours taken at other University of Colorado campuses (CU Denver and UCCS) can be counted toward the minimum 45 credit hours required on the Boulder campus. Courses taken while on CU Boulder study abroad programs, through CU Boulder continuing education or CU Boulder correspondence courses are considered to be in residence.

5. For the Bachelor of Arts degree, students must complete a minimum of 75 credit hours outside their major department. Students who complete designated departmental honors courses in their major department and/or in honors thesis credit can reduce the 75 credit hours required outside the major department by a corresponding number of credits, up to a maximum of 6.
6. For the bachelor of fine arts degree, students must complete a minimum of 53 credit hours outside of their major.
7. Complete a major offered by the College of Arts and Sciences. Students are subject to the major requirements in force when they declare the major. See the sections Majors and Other Areas of Interest and Minimum Major Requirements in this section.
8. Complete the general education (college core curriculum) and MAPS requirements with the following limitations:
 - Although a single course may be listed in more than one core area, a student may use it to meet only one area requirement.
 - Neither independent study nor pass/fail courses may be used to meet MAPS-deficiencies, core requirements, minor requirements or the minimum major requirements.
 - A single course may be used to meet both MAPS and core requirements as long as the course is applicable to both requirements. For example, a student admitted with a MAPS deficiency in English composition may take WRTG 1150, to satisfy both the MAPS requirement and the core curriculum lower-division written communication requirement.

This policy only applies to college level course work (CU or accepted transfer credit). If a student is exempt from a given core area, this does not exempt the student from fulfilling a MAPS deficiency in that area. A description of the College of Arts and Sciences MAPS requirements can be found in the General Information section.

After fall 2010, the Minimum Academic Preparation Standards for mathematics for the College of Arts and Sciences is four units including two of algebra, one of geometry, and one of college preparatory math such as trigonometry, analytic geometry or elementary functions. This applies to students graduating from high school in spring 2010 and after.

If it has been more than 10 years since matriculation into the College of Arts and Sciences and no degree has been completed, students may be subject to new curricula in place at time of re-enrollment. See the Minimum Major Requirements (p. 129) section for additional information on major requirements. Students may contact the Academic Advising Center for further assistance.

Majors and Other Areas of Interest

To be eligible for the four-year guarantee, a student must begin the program of study and declare the major by the start of the second semester or earlier for some select majors. For complete information, see the Four-Year Graduation Requirements in this section.

All arts and sciences students pursuing a bachelor's degree must enter a degree-granting major by the end of their sophomore year (i.e., the semester in which they will complete 60 semester credit hours of work, including transfer work).

College academic advisors are responsible for advising students and also for certifying the completion of those students' programs for graduation. The college can assume no responsibility for difficulties arising out of a student's failure to establish and maintain contact with their assigned academic advisor.

Minimum Major Requirements

The following minimum requirements are specified by the college. In many cases departmental requirements may be higher than the minimums listed here.

1. A minimum of 30 credit hours in the major area (for the BFA, a minimum of 50 credit hours).
2. Thirty credit hours in the major area, all with grades of C- (1.70) or higher (no pass/fail credits can be applied to the major).
3. Eighteen credit hours of upper-division courses in the major, all with grades of C- (1.70) or higher.
4. Twelve credit hours of upper-division course work in the major on the CU Boulder campus.
5. A 2.00 (C) overall grade point average in all major work attempted.
6. Special requirements as stipulated by the major department.
7. No more than 8 credit hours of independent study.

Students are subject to those major requirements in effect at the time they formally declare the major. All College of Arts and Sciences students have 10 years to complete the requirements for a declared major. If this 10-year limit is exceeded, students may be required to satisfy the current major requirements. Students with further questions should consult a major advisor.

Open Option

"Open option" (OPNO) is a major designation, but it is not a degree program. Open option students are advised in the Center for First-Year Students, which offers a structured advising program that provides students with the necessary support and strategies to investigate and compare academic disciplines so they can make informed decisions about the degree programs they will pursue. Students can explore any major available in the college while completing course requirements toward a baccalaureate degree. To ensure that students graduate in a timely manner, open option majors are required to enter a specific degree program by the time they have completed 45 credit hours (approximately the end of the third semester). Students must declare and enter a degree-granting major by the start of the second semester (or earlier for certain majors) to maintain eligibility for the four-year guarantee.

Double Majors

Students pursuing either the BA or BFA degree may graduate with more than one major within the degree (e.g., economics and French) by completing all requirements for both majors. A minimum of 120 total credit hours is required for double majors within the College of Arts and Sciences.

Minors

A number of departments and programs in the College of Arts and Sciences offer minor programs. Participation in a minor program is optional for students pursuing a bachelor's degree. Course work applied

to a minor also may be applied toward general education (core curriculum or college list) and major requirements. Students may not earn a major and a minor in the same program of study. All requirements for the minor must be completed by the time the BA or BFA is conferred.

Departments and programs with approved minor programs currently include applied mathematics; astrophysical and planetary sciences; atmospheric and oceanic sciences; chemistry and biochemistry; Chinese; classics; dance; ecology and evolutionary biology; economics; English-creative writing; ethnic studies; French; geography; geological sciences; Germanic studies; history; Italian; Japanese; Jewish studies; linguistics; mathematics; Nordic studies; philosophy; physics; political science; religious studies; Russian studies; Spanish and Portuguese—Portuguese; theatre; and women's studies. Minors are also available in business, offered by the Leeds School of Business; and in computer science, offered by the College of Engineering and Applied Science. Interested students can find further information at advising.colorado.edu. (<http://advising.colorado.edu>)

Although the structure of specific minor programs may differ, all minors offered in the College of Arts and Sciences must have the following restrictions or minimum requirements:

1. A minimum of 18 credit hours must be taken in the minor area, including a minimum of 9 upper-division credit hours.
2. All course work applied to the minor must be completed with a grade of C- or better (no pass/fail work may be applied). The grade point average for all minor degree course work must be equal to 2.00 (C) or higher.
3. Students pursuing a major in distributed studies or an individually structured major are not eligible to earn a minor.
4. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.
5. Students may earn no more than two minors.
6. Students must complete all requirements for a minor by the time they graduate.

Areas of Interest

The college sponsors programs—but not undergraduate majors—in the areas of interest below. Course work in these areas is open to all interested students. Contact the Office of the Dean for more information.

- African American Studies
- American Indian Studies
- Asian American Studies
- Chicano Studies
- Honors
- International and National Voluntary Service Training
- Museum

Certificate Programs

The college also sponsors undergraduate certificate programs in a number of fields of study. Completion of specified course work in the certificate programs below entitles students to a certificate issued by the dean of the college. Students interested in these programs should contact the director of the appropriate program.

- Actuarial Studies and Quantitative Finance
- British and Irish Studies
- Central and Eastern European Studies

- Cognitive Sciences
- European Union Studies
- Foundations of Western Civilization
- Global Environmental Affairs
- Global Gender and Sexuality Studies
- International Media
- Lesbian, Gay, Bisexual and Transgender Studies
- Medieval and Early Modern Studies
- Middle Eastern and Islamic Studies
- Neurosciences and Behavior
- Peace and Conflict Studies
- Public Health
- South Asian Languages and Civilizations
- Western American Studies

Multiple Degrees

Dual Degrees

Two different degrees (i.e., a BA and BFA from the College of Arts and Sciences, or two degrees from different schools or colleges) may be earned from CU Boulder if the following conditions are fulfilled:

- The student meets the residency requirements of, and is enrolled in, both the College of Arts and Sciences and the college or school granting the second degree.
- The student completes a minimum of 145 credit hours when both degrees are offered within the College of Arts and Sciences.
- The student completes all requirements for both degrees when the degrees are offered by two different colleges.
- For the BA and BFA degrees, 90 credit hours of arts and sciences course work are required (courses from outside arts and sciences that have been approved for the arts and sciences core curriculum will apply toward the 90 credit hours).
- The student has completed all general education and major requirements of the College of Arts and Sciences.
- Both degrees must be awarded at the same time.

Second Baccalaureate Degrees

A student who has been awarded a baccalaureate degree, either from this college or elsewhere, may be granted a second baccalaureate degree provided the following conditions have been fulfilled:

1. All general requirements for the degree to be awarded by the College of Arts and Sciences have been met. (Students are subject to the general degree requirements in effect the semester they enter the second baccalaureate degree program.)
2. The major in the BA or BFA is different from the major in the first degree earned.
3. Arts and sciences students must complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus toward the second degree after admission to the second undergraduate degree program. Of these 45 credit hours, a minimum of 30 credit hours must be in arts and sciences upper-division credit hours completed as a matriculated student in the second undergraduate degree in the College of Arts and Sciences at the University of Colorado Boulder and at least 12 of these upper-division credit hours must be in the major. Courses taken as a nondegree

student or as part of a graduate degree program do not count in these minimum requirements.

Graduation Deadlines

Arts and Sciences students who have earned 80 or more credit hours and wish to walk in a commencement ceremony and/or graduate at the close of a term must submit an online application to graduate via the MyCUInfo (<https://mycuinfo.colorado.edu>) student portal, meeting all appropriate application deadlines published by the Office of the Registrar (see the Graduation & Diploma Calendar (<http://www.colorado.edu/registrar/students/academic-calendar/graduation-diploma-calendar>)). Students should also consult with their primary Arts and Sciences academic advisor.

Students who intend to complete their degree in summer (August) and want their name to appear in the spring (May) commencement program should apply online for the summer graduation term, submitting their application prior to the published spring commencement program deadline. Summer applicants who apply prior to the spring program deadline will automatically be included in the spring commencement program.

Students who apply to graduate but fail to fulfill all degree requirements by the deadline for that term/year must submit a new online graduation application for a future term/year in order for the college to confer the degree once all remaining requirements are complete. To be certified as having completed all degree and major/minor requirements, all credit hours and grades (including transfer course work and Continuing Education credit hours and grades) must be posted to the student records system by the deadline for reporting degrees for that term/year.

Core Curriculum

The mainstay of the general education requirements is the College of Arts and Sciences core curriculum. The core curriculum requirements are divided into two parts: skills acquisition and content areas of study. The following sections provide descriptions of the individual requirement areas, their underlying educational philosophies and goals and the list of approved courses. For the updated list of approved core courses, visit the college's Core Curriculum (<http://www.colorado.edu/artsandsciences/student-resources/core-curriculum>) webpage.

Exemptions

Selected majors and the ecology and evolutionary biology minor are exempt from portions of the core curriculum, as core course work is considered equivalent to course work in the major. Students who graduate with more than one exempt major may apply their exemptions cumulatively.

Skills Acquisition

These requirements are designed to assure that each student has attained a minimum level of competency in each of the areas listed: foreign language, quantitative reasoning and mathematical skills and written communication.

Although a single course may appear in several areas, students may use it to meet only one core requirement.

1. Foreign Language

All students are required to demonstrate, while in high school, third-level proficiency in a single modern or classical foreign language. Students who have not met this requirement at the time of matriculation will have a MAPS deficiency. They may make up the deficiency only by passing an

appropriate third-semester college course or by passing a CU Boulder approved proficiency examination. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of D- or higher.

Students who are under the core curriculum, but not subject to MAPS, must complete the foreign language requirement to meet degree requirements.

Questions about placement should be referred to the appropriate foreign language department.

The goal of the language requirement is to encourage students to confront the structure, formal and semantic, of another language, significant and difficult works in that language and one or more aspects of the culture lived in that language. This enables students to understand their own language and culture better, analyze texts more clearly and effectively and appreciate more vividly the dangers and limitations of using a translated document. The language requirement is a general education requirement and so concentrates on reading. In some languages other abilities may be emphasized as well. Understanding what it means to read a significant text in its original language is essential for general education according to the standards of this university.

CU Boulder courses that satisfy this requirement include the following:

ARAB 2110	Intermediate Arabic 1 ¹	5
CHIN 2110	Intermediate Chinese 1	5
DANE 2010	Intermediate Danish I - DILS	4
FINN 2010	Intermediate Finnish 1 - DILS	4
FREN 2110	Second-Year French Grammar Review and Reading 1 ¹	3
FRSI 2110	Intermediate Farsi 1 (formerly FRSI 2010)	4
GREK 3113	Intermediate Classical Greek 1 (formerly CLAS 3113)	3
GRMN 2010	Intermediate German 1 ¹	4
GRMN 2030	Intensive Intermediate German	5
HEBR 2110	Intermediate Modern Hebrew, First Semester ¹	4
HIND 2110	Intermediate Hindi 1 (formerly HNDI 2010)	5
INDO 2010	Intermediate Indonesian 1	4
ITAL 2110	Intermediate Italian Reading, Grammar, and Composition 1 ¹	3
JPNS 2110	Intermediate Japanese 1	5
KREN 2110	Intermediate Korean 1	5
LATN 2114	Intermediate Latin 1 (formerly CLASS 2114) ¹	4
NORW 2110	Second-Year Norwegian Reading and Conversation 1 ¹	4
PORT 2110	Second-Year Portuguese 1 ¹	3
RUSS 2010	Second-Year Russian 1 ¹	4
SLHS 2325	American Sign Language 3	4
SPAN 2110	Second-Year Spanish 1 ¹	3
SPAN 2150	Intensive Second-Year Spanish ¹	5
SWED 2010	Intermediate Swedish 1 - DILS ¹	4

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html (<http://higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

2. Quantitative Reasoning and Mathematical Skills (QRMS) (3–6 credit hours)

Liberal education should be able to think at a certain level of abstraction and to manipulate symbols. This requirement has two principal objectives. The first is to provide students with the analytical tools used in core curriculum courses and in their major areas of study. The second is to help students acquire the reasoning skills necessary to assess adequately the data which will confront them in their daily lives. Students completing this requirement should be able to: construct a logical argument based on the rules of inference; analyze, present and interpret numerical data; estimate orders of magnitude as well as obtain exact results when appropriate; and apply mathematical methods to solve problems in their university work and in their daily lives.

Students can fulfill the requirement by passing one of the courses or sequences of courses listed below or by passing the CU Boulder QRMS proficiency exam. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of D- or higher.

ECEN 1500	Sustainable Energy	3
ECON 1078	Mathematical Tools for Economists 1	3
ECON 1088	Mathematical Tools for Economists 2	3
MATH 1011	College Algebra	3
MATH 1012	Quantitative Reasoning and Mathematical Skills ¹	3
MATH 1071	Finite Mathematics for Social Science and Business	3
MATH 1081	Calculus for Social Science and Business	3
MATH 1110 & MATH 1120	Mathematics for Elementary Educators 1 and Mathematics for Elementary Educators 2	6
MATH 1112	Mathematical Analysis in Business	4
MATH 1130	Mathematics from the Visual Arts	3
MATH 1150	Precalculus Mathematics ¹	4
MATH 1212	Data and Models	3
MATH 2380	Mathematics for the Environment ¹	3
PHYS 1010	Physics of Everyday Life 1	3
PHYS 1020	Physics of Everyday Life 2	4
PSCI 2075	Quantitative Research Methods	3
PSCI 3105	Designing Social Inquiry: An Introduction to Analyzing Political Phenomena	3
Any 3 credits of mathematics courses numbered MATH 1300 and above or applied mathematics courses numbered APPM 1350 and above ²		3-5

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html (<http://higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

² NOTE: MATH 1300 and APPM 1350 are approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html (<http://higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

3. Written Communication (3 lower-division and 3 upper-division credit hours)

Writing is a skill fundamental to all intellectual endeavors. While some college courses require more writing than others, good writing is recognized as a necessary means of communication in every scholarly discipline. The core curriculum promotes the principle that ideas do not exist apart from language, and thus content cannot be isolated from style. For ideas to flourish, they must be expressed clearly and gracefully, so that readers take pleasure while taking instruction. Students may meet the lower-division component of this requirement by first passing one of the approved lower-division courses or by receiving a score of 4 or 5 on the English Language and Composition Advanced Placement exam. Students may then complete the upper-division component of this requirement by passing one of the approved upper-division courses or by passing the written communication proficiency exam. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of D- or higher.

Lower-Division Courses

ARSC 1080	College Writing and Research	4
ARSC 1150	Writing in Arts and Sciences ¹	3
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	3
EBIO 1940	College Writing for Science Students	3
ENGL 1001	Freshman Writing Seminar	3
ENVS 1150	First-Year Writing in Energy, Environment and Sustainability	3
IPHY 1950	Introduction to Scientific Writing in Integrative Physiology	3
PHIL 1500	Reading, Writing and Reasoning	3
WRTG 1100	Extended First-Year Writing and Rhetoric ¹	4
WRTG 1150	First-Year Writing and Rhetoric ¹	3
WRTG 1250	Advanced First-Year Writing and Rhetoric ¹	3

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html (<http://higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

Upper-Division Courses

ARSC 3100	Multicultural Perspective and Academic Discourse	3
CHIN/JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	3
EBIO 3940	Written Communication in the Sciences	3
ENVS 3020	Advanced Writing in Environmental Studies	3
GEOL 3090	Developing Scientific Writing Skills	3
HIST 3020	Historical Thinking & Writing	3
HONR 3220	Advanced Honors Writing Workshop ¹	3

IPHY 3700	Scientific Writing in Integrative Physiology	3
ITAL 3025	Advanced Composition 2: Introduction to Literary Writing	3
PHIL 3480	Critical Thinking/Writing in Philosophy	3
PHYS 3050	Writing in Physics: Problem-Solving and Rhetoric ¹	3
RLST 3020	Advanced Writing in Religious Studies	3
SOCY 4010	Sociology Capstone Course: Professional Writing	3
SPAN 3010	Advanced Rhetoric and Composition	3
WGST 3800	Advanced Writing in Feminist Studies	3
WRTG 3007	Writing in the Visual Arts ¹	3
WRTG 3020	Topics in Writing	3
WRTG 3030	Writing on Science and Society ¹	3
WRTG 3035	Technical Communication and Design ¹	3
WRTG 3040	Writing on Business and Society	3

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higherred.colorado.gov/Academics/Transfers/gtPathways/curriculum.html (<http://higherred.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

Content Areas of Study

4. Historical Context (3 credit hours)

Courses that fulfill this requirement enable students to study historical problems or issues and to develop an understanding of earlier ideas, institutions and cultures.

Courses explore the times and circumstances in which social, intellectual, artistic or other developments occurred. The purpose of this exploration is to analyze subjects in their context, that is, to investigate both the processes and the meanings of change. Among the educational aims of these courses are the following: to contribute to historical perspectives that may help to clarify issues that arise today or will arise tomorrow, to arouse the curiosity of students concerning historical conditions that may be relevant to subjects studied in other courses and to expand the imagination by generating an awareness of the diverse ways in which our common humanity has expressed itself.

Students may choose to meet this 3-credit-hour requirement by passing any course listed below. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of *D-* or higher.

ANTH 1180	Maritime People: Fishers and Seafarers	3
ANTH 1190	Origins of Ancient Civilizations	3
ANTH 2200	The Archaeology of Human History	3
ANTH/CLAS 3009	Modern Issues, Ancient Times	3
ARAB 3230	Islamic Culture and the Iberian Peninsula	3
ARTH/CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World	4
ARTH/CLAS 3019	Pompeii and the Cities of Vesuvius	3
CEES/HIST 1626	Introduction to Central and East European History since 1770 ¹	3
CLAS 1030/ PHIL 1010	Introduction to Western Philosophy: Ancient ¹	3
CLAS/HIST 1051	The World of the Ancient Greeks ¹	3

CLAS/HIST 1061	The Rise and Fall of Ancient Rome ¹	3
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World ¹	3
ECON 4514	Economic History of Europe	3
ENGL 3164	History and Literature of Georgian Britain	3
ENGL 4113	History and Culture of Medieval England	3
GRMN 2301	Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich	3
GRMN 3506	Tracing the Criminal: Crime in 19th C Society and Culture	3
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600 (formerly HIST 1010)	3
HIST 1012	Empire, Revolution and Global War: European History Since 1600	3
HIST 1018	Introduction to Early Latin American History to 1810	3
HIST 1028	Introduction to Modern Latin American History since 1800 (formerly HIST 1038)	3
HIST 1113	Introduction to British History to 1660 (formerly HIST 2103)	3
HIST 1123	Introduction to British History Since 1660 (formerly HIST 2123)	3
HIST 1218	Introduction to Sub-Saharan African History to 1800 (formerly HIST 1208)	3
HIST 1228	Introduction to Sub-Saharan African History Since 1800	3
HIST 1308	Introduction to Middle Eastern History	3
HIST 1438	Introduction to Korean History	3
HIST 1518	Introduction to South Asian History to 1757	3
HIST 1528	Introduction to South Asian History since 1757 (formerly HIST 1408)	3
HIST 1618	Introduction to Chinese History to 1644 (formerly HIST 1608)	3
HIST 1628	Introduction to Chinese History since 1644	3
HIST 1708	Introduction to Japanese History ¹	3
HIST/JWST 1818	Introduction to Jewish History: Bible to 1492	3
HIST/JWST 1828	Introduction to Jewish History since 1492	3
HIST/JWST/ RLST 1830	Global History of Holocaust and Genocide	3
HIST 2100	Revolution in History	3
HIST 2110	History of Early Modern Societies (formerly HIST 2112)	3
HIST 2170	History of Christianity 1: To the Reformation	3
HIST 2220	History of War and Society (formerly HIST 2222)	3
HIST 2629	China in World History	3
HIST 4190/ IAFS 3500	French Connections: Contemporary France and America in Historical Context	3
HONR 2251	Introduction to the Bible	3
HUMN 3850	The Mediterranean Religion Before Modernity	3
IAFS/JWST 3650	History of Arab-Israeli Conflict	3
JWST/RLST 3100	Judaism	3
LIBB 1700	The History of Communication from Caves to Cyberspace	3
PHIL 1020	Introduction to Western Philosophy: Modern ¹	3
PHIL 3000	History of Ancient Philosophy	3

PHIL 3010	History of Modern Philosophy	3	ANTH 1100	Exploring a Non-Western Culture: The Tamils	3
PHIL 3410	History of Science: Ancients to Newton	3	ANTH 1105	Exploring a Non-Western Culture: Tibet	3
PHIL 3430	History of Science: Newton to Einstein	3	ANTH 1115	The Caribbean in Post-Colonial Perspective	3
RLST 3000	Christian Traditions	3	ANTH 1120/ ETHN 1123	Exploring a Non-Western Culture: Hopi and Navajo	3
RUSS 2211	Introduction to Russian Culture	3	ANTH 1135	Exploring Cultural Diversity	3
RUSS 2221	Introduction to Modern Russian Culture	3	ANTH 1140	Exploring a Non-Western Culture: The Maya	3
RUSS 2222	Sports and the Cold War	3	ANTH 1145	Exploring a Non-Western Culture: The Aztecs	3
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century ¹	3	ANTH 1150	Exploring a Non-Western Culture: Regional Cultures of Africa	3
RUSS 3601	Russian Culture Past and Present	3	ANTH 1170	Exploring Culture and Gender through Film	3
RUSS 4301	American-Russian Cultural Relations	3	ANTH 2100	Introduction to Cultural Anthropology	3
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	3	ANTH 3760	Exploring Culture and Media in Southeast Asia	3
SCAN 2202	The Vikings	3	ARAB 1011	Introduction to Arab and Islamic Civilizations	3
			ARAB/RLST 2320	The Muslim World, 600-1250	3
			ARSC 3001	Social Engagement & Human Rights: The South Africa Model	6
			ARTH 3209	Art, Culture, and Gender Diversity, 1400-1600: Renaissance Art Out of the Canon	3
			ARTH/CLAS 4269	Art and Archaeology of the Ancient Near East	3
			ARTH/WGST 4769	Gender Studies in Early Modern Visual Culture	3
			ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
			ASTR 2000	Ancient Astronomies of the World	3
			CHIN 1012	Introduction to Chinese Civilization	4
			CLAS/WGST 2100	Gender and Sexuality in Ancient Greece	3
			CLAS/WGST 2110	Gender and Sexuality in Ancient Rome ¹	3
			COMM 2400	Discourse, Culture and Identities ¹	3
			COMM 3410	Intercultural Communication	3
			ECON 4626	The Economics of Inequality and Discrimination	3
			EDUC 3013	School and Society	3
			ENGL/WGST 1260	Introduction to Women's Literature	3
			ENGL 1800	American Ethnic Literatures	3
			ENGL/JWST 4677	Jewish-American Literature	3
			ETHN 1022	Introduction to Africana Studies (formerly ETHN 2002)	3
			ETHN 1023	Introduction to Native American and Indigenous Studies (formerly ETHN 2003)	3
			ETHN 1025	Introduction to Asian American Studies (formerly AAST 1015)	3
			ETHN 2013	Critical Issues in Native North America (formerly AIST 2015)	3
			ETHN 2215	The Japanese American Experience (formerly AAST 2210)	3
			ETHN 2232	Contemporary African American Social Movements (formerly BLST 2200)	3
			ETHN 2242	African American Social and Political Thought (formerly BLST 2210) ¹	3
			ETHN 2432/ HIST 2437	African American History (formerly BLST 2437/ HIST 2437)	3

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5. Human Diversity (3 credit hours)

Courses fulfilling this requirement increase the student's understanding of the world's diversity and pluralism through the study of two broad and interrelated areas: (1) the nature and meaning of diversity and the experience of marginalized groups; and (2) cultures other than those of Europe and the United States. This requirement explicitly identifies an awareness and understanding of pluralism as essential to a liberal education.

- Gender, Ethnic and Social Diversity.** Courses in this area are designed to expand the range of each student's understanding of the experience of individuals and groups who, because of such fundamental components of identity as race, ethnicity, gender or other characteristics, have been historically marginalized by society and placed outside of the mainstream. Generally courses will explore the ways in which marginalization has occurred and the reasons for this marginalization. The intent is to expand understanding of these social groups with the goal of identifying the way social categories shape human thought and experience.
- Non-Western Cultures.** These courses are designed to expand the range of the student's understanding of cultures that are not derived principally from the western experience. A comparative perspective introduces students to the commonality and diversity of cultural responses to universal human problems. Each course seeks to cultivate insight into and respect for diversity by requiring students to explore a cultural world quite different from their own.

Courses satisfying this requirement are intended to portray culture in the most integrated sense, including aspects of material adaptation, social pattern, ideas and values and aesthetic achievement.

Students are required to pass 3 credit hours of course work from any course listed below. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of D- or higher. Students who graduate with a major in ethnic studies are exempt from completing the human diversity requirement.

ETHN 2536	Survey of Chicana/o History and Culture (formerly CHST 2537/HIST 2537)	3	LGBT 2000/ WGST 2030	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies ¹	3
ETHN 2546	Chicana and Chicano Fine Arts and Humanities (formerly ETHN 1036)	3	LIBB 1600	Gender and Film ¹	3
ETHN 3136/ WGST 3135	Chicana Feminisms and Knowledges (formerly CHST 3135/WMST 3135)	3	LING 1020	Languages of the World	3
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices	3-4	LING 2400	Language, Gender and Sexuality ¹	3
ETHN 3213/ WGST 3210	American Indian Women (formerly AIST 3210/ WMST 3210)	3	LING 3220	American Indian Languages in their Social and Cultural Context	3
ETHN 3671	People of Color and Social Movements (formerly ETHN 3675)	3	MUEL 2772	World Musics: Asia and Oceania	3
FILM 3013	Women and Film	3	MUEL 2782	World Music: Africa, Europe, and the Americas	3
FREN/ITAL 1400	Medieval/Renaissance Women Writers in Italy and France ¹	3	PHIL 2270	Philosophy and Race	3
FREN 1750	French Colonialism: North Africa and the Middle East	3	PHIL/WGST 2290	Philosophy and Women	3
FREN 1950	French Feminisms	3	PSCI 3101	Black Politics	3
FREN 3800	France and the Muslim World	3	PSCI 3301/ WGST 3300	Gender, Sexuality and U.S. Law	3
GEOG/WGST 3672	Gender and the Global Economy	3	PSCI 4131	Latinos and the U.S. Political System	3
GEOG 3822	Geography of China	3	PSYC/WGST 2700	Psychology of Gender and Sexuality	3
GRMN/JWST 3501	German-Jewish Writers: From the Enlightenment to the Present	3	RLST 2612	Yoga: Ancient and Modern	3
GRMN/WGST 3601	German Women Writers	3	RLST 2700	American Indian Religious Traditions ¹	3
GRMN/WGST 4301	Gender, Race and Immigration in Germany and Europe	3	RLST/WGST 2800	Women and Religion ¹	3
GSLI/JWST 2350	Introduction to Jewish Culture	3	RUSS 3705	Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia	3
HEBR/JWST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions (formerly HEBR 2350/JSWT 2350)	3	RUSS/WGST 4471	Women in 20th-21st Century Russian Culture	3
HIND 1011	Introduction to South Asian Civilizations	3	SCAN 3206	Nordic Colonialisms	3
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature (formerly HNDI 3811)	3	SCAN/WGST 3208	Women in Nordic Society: Modern States of Welfare	3
HIST 2616	History of Gender in America ¹	3	SOCY/WGST 1016	Sex, Gender, and Society ¹	3
HONR 1810	Honors Diversity Seminar	3	SOCY/WGST 3012	Women and Development	3
HONR/WGST 3004	Women in Education	3	SPAN 3270	Barcelona: Understanding Local and Immigrant Cultures	3
HONR 3270	Journey Motif in Women's Literature	3	WGST 2000	Introduction to Feminist Studies	3
HONR 4025	Heroines and Heroic Tradition	3	WGST 2020	Femininities, Masculinities, Alternatives	3
HUMN 2145	African America in the Arts	3	WGST 2050	Gender, Sexuality, and Popular Culture	3
HUMN/ITAL 4150	Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages	3	WGST 2200	Women, Literature, and the Arts	3
HUMN/ITAL 4730	Italian Feminisms: Culture, Theory, and Narratives of Difference	3	WGST 3670	Gender, Race, Sexuality and Global Migration	3
IAFS/GSLI/JWST 3600	Contemporary Jewish Societies	3			
INVS/EDUC 2919	Renewing Democracy in Communities and Schools	3			
IAFS/JWST/ RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	3			
ITAL 4300	Multiculturalism in Italy	3			
JPNS 1012	Introduction to Japanese Civilization	4			
KREN 1011	Introduction to Korean Civilization	3			

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6. United States Context (3 credit hours)

Courses fulfilling the United States Context requirement explore important aspects of culture and society in the United States. They stimulate critical thinking and an awareness of the place of the United States in the world by promoting an understanding of the world views that the environment, culture, history and values of the United States have fostered. They are required to include some discussion of the realities and issues related to matters of ethnic and racial diversity that

characterize the nation's ongoing experience. These courses familiarize students with the United States and enable them to evaluate it critically.

These courses teach an appreciation of United States culture while inviting students to ask probing questions about values and ideals that are understood to be an integral part of the United States. Some of the questions that might be addressed in these courses are: How have citizens and other residents of the United States derived a sense of identity from geography, language, politics and the arts? How do people in the United States view and influence the world beyond the nation's borders? How have the rights and responsibilities of citizenship changed over time? How have U.S. citizens and residents in the United States dealt with opposing values? Completing this requirement, students will develop both a better understanding of the United States, present and past, and a considerable interest in the nation's future.

This 3-credit-hour requirement may be fulfilled by passing any course listed below. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of *D-* or higher.

ANTH 3170	America: An Anthropological Perspective	3
ARTH 3509	American Art	3
BAKR 1500	Colorado: History, Ecology, and Environment	3
CAMW 2001	The American West ¹	3
ECON 4524	Economic History of the United States	3
EDUC 2125	History of American Public Education	3
ENGL 2115	American Frontiers	3
ETHN 2004	Themes in American Culture 1 (formerly AMST 2000)	3
ETHN 2013	Critical Issues in Native North America (formerly AIST 2015)	3
ETHN 2014	Themes in American Culture 2 (formerly AMST 2010)	3
ETHN 2432/ HIST 2437	African American History (formerly BLST 2437/ HIST 2437)	3
ETHN 2536	Survey of Chicana/o History and Culture (formerly CHST 2537/HIST 2537)	3
ETHN 3015	Asian Pacific American Communities (formerly AAST 3013)	3
ETHN 4504	Ethnic-American Autobiography (formerly AMST 4500)	3
HIST 1015	American History to 1865 ¹	3
HIST 1025	American History since 1865 ¹	3
HIST 2015	Themes in Early American History ¹	3
HIST 2126	Issues in Modern U.S. Politics and Foreign Relations	3
HIST 2166	The Vietnam Wars	3
HIST 2326	Issues in the History of U.S. Society and Culture	3
HIST 2516	America Through Baseball	3
HUMN 2145	African America in the Arts	3
INVS 1523	Civic Engagement: Democracy as a Tool for Social Change ¹	3
ITAL 4350	From Wops to Dons to Movers and Shakers: The Italian-American Experience	3
LIBB 2800	Horror Films and American Culture	3
LING 1000	Language in U.S. Society	3
MUEL 2752	Music in American Culture	3

PHIL 1200	Contemporary Social Problems ¹	3
PHIL 2220	Philosophy and Law	3
PSCI 1101	Introduction to American Politics ¹	3
PSCI 3011	The American Presidency and the Executive Branch	3
PSCI 3021	U.S. Campaigns and Elections	3
PSCI 3054	American Political Thought	3
PSCI 3061	State Government and Politics	3
PSCI 3071	Urban Politics	3
PSCI 3163	American Foreign Policy	3
PSCI 3274	Capitalism and its Critics (formerly PSCI 3171)	3
RLST 2500	Religions in the United States ¹	3
RLST 3050	Religion and Literature in America	3
RUSS 4301	American-Russian Cultural Relations	3
SOCY 1021	United States Race and Ethnic Relations ¹	3
SOCY/WGST 3016	Marriage and the Family in U.S. Society	3
SOCY 3151	Self in Modern Society	3
WGST 2400	Women of Color and Activism	3

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7. Literature and the Arts (6 credit hours, 3 of which must be upper-division)

These courses promote a better understanding of fundamental aesthetic and cultural issues. They sharpen critical and analytical abilities so that students may develop a deeper appreciation of works of art. The goal of this requirement is to enhance the student's ability to read critically, to understand the elements of art and to grasp something of the complex relations between artist and public, and between art work and cultural matrix. The emphasis in courses which fulfill this requirement is on works that are generally recognized as central to and significant for one's cultural literacy and thereby enhance the student's understanding of our literary and artistic heritage.

Courses stress literary works as well as the history and criticism of literature and the arts. They may utilize creative projects as a means of arriving at a better understanding of the art form, but students may not use studio or performance classes to satisfy this requirement.

Students are required to pass 6 credit hours of course work in literature and the arts, of which at least 3 credit hours must be upper-division. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of *D-* or higher.

If students graduate with a major dealing in depth with literature and the arts (Chinese, classics, dance, English, fine arts, French, Germanic studies, humanities, Italian, Japanese, Portuguese, Russian, Spanish or theatre), they are exempt from this requirement.

Courses offered at CU Boulder that satisfy this requirement include the following:

Lower-division Courses

ARAB 2231	Love, Loss and Longing in Classical Arabic Literature	3
ARTH 1300	History of World Art 1 ¹	3
ARTH 1400	History of World Art 2 ¹	3
ARTH/CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World	4
ARTH/CLAS 2039	Greek Art and Archaeology	3
ARTH/CLAS 2049	Introduction to Roman Art and Architecture	3
ARTH 1709	Freshmen Seminar: Critical Introduction to Art History	3
ARTH 2409	Intro to Asian Art ¹	3
CHIN 1051	Masterpieces of Chinese Literature in Translation	3
CHIN 2441	Film and the Dynamics of Chinese Culture ¹	3
CLAS 1100	Greek Mythology	3
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece	3
CLAS 1115	Masterpieces of Greek Literature in Translation	3
CLAS 1120	Power and Passion in Ancient Rome	3
COMR 1800	Visual Literacy: Images and Ideologies	3
DNCE 1017	Dance in Popular Culture and Media	3
DNCE 1027	Dance in Cultural Perception and Expression (formerly DNCE 1029)	3
ENGL 1220	From Gothic to Horror	3
ENGL 1230	Environmental Literature	3
ENGL 1420	Poetry	3
ENGL 1500	Masterpieces of British Literature	3
ENGL 1600	Masterpieces of American Literature	3
FARR 2002	Literature of Lifewriting	3
FREN 1200	Medieval Epic Through Game of Thrones	3
FREN 1610	How to Be French, 1: The Ancien Regime	3
FREN 1620	How To Be French? 2: Modernity	3
FREN 1750	French Colonialism: North Africa and the Middle East	3
FREN 1880	The Zombie in History and Popular Culture	3
FREN 1900	Modern Paris in Literature, Photographs, Paintings and Movies	3
GRMN 1602	Metropolis and Modernity	3
GRMN 2501	Miniatures of Modern Life: Introduction to Short Fiction	3
GRMN 2503	Fairy Tales of Germany ¹	3
GRMN/HUMN 2601	Kafka and the Kafkaesque ¹	3
GSSL/JWST 2551	Modern Jewish Literature	3
HONR 2860	The Figure of Socrates	3
HUMN 1110	Introduction to Humanities: Literature 1	3
HUMN 1120	Introduction to Humanities: Literature 2	3
HUMN 1210	Introduction to Humanities: Art and Music 1	3
HUMN 1220	Introduction to Humanities: Art and Music 2	3
HUMN 2100	Arts, Culture and Media	3
ITAL 1600	Strategies of Fear: Introduction to Italian Fantastic Literature	3
JPNS 1051	Masterpieces of Japanese Literature in Translation	3
MUEL 1832	Appreciation of Music	3

MUEL 2852	Music of the Rock Era	3
MUEL 2862	American Film Musical	3
RUSS 2231	Fairy Tales of Russia ¹	3
RUSS 2241	The Vampire in Literature and the Visual Arts	3
RUSS 2251	Knights and Amazons: Superheroes in Russian Epics and Film	3
RUSS 2261	The Russian Short Story	3
SCAN 1202	Tolkien's Nordic Sources and the Lord of the Rings	3
SPAN 1000	Cultural Difference through Hispanic Literature ¹	3
THTR 1009	Theatre and Society ¹	3
THTR 1011	Global Theatre 1: Live Performance to Shakespeare ¹	3
WGST 2200	Women, Literature, and the Arts	3

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Upper-division Courses

ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit	3
ARAB 3241	Art in Islamic Cultures	3
ARTH 4329	Modern Art 1	3
CHIN/HUMN 3341	Literature and Popular Culture in Modern China	3
CHIN 3351	Reality and Dream in Traditional Chinese Literature	3
CLAS/HUMN 4110	Greek and Roman Epic	3
CLAS/HUMN 4120	Greek and Roman Tragedy	3
CLAS/HUMN 4130	Greek and Roman Comedy	3
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance (formerly DNCE 3027)	3
ENGL 3000	Shakespeare for Nonmajors	3
ENGL 3060	Modern and Contemporary Literature for Nonmajors	3
ENGL 3300	Literary London	3
FILM/RUSS 3211	History of Russian Cinema	3
FILM 3402	European Film and Culture	3
FILM/HUMN 3660	The Postmodern	3
FILM/HUMN 4135	Art and Psychoanalysis	3
FREN 3200	Introduction to Literary Theory and Advanced Critical Analysis	3
FREN 4300	Theatre and Modernity in 17th Century France	3
GRMN 3502	Literature in the Age of Goethe	3

GRMN/HUMN 3702	Dada and Surrealist Literature	3	Through a combination of lecture courses and laboratory or field experiences, students gain hands-on experience with scientific research.
GRMN/HUMN 3802	Politics and Culture in Berlin 1900-1933	3	They develop observational skills of measurement and data interpretation and learn the relevance of these skills to the formation and testing of scientific hypotheses.
GRMN/HUMN 4504	Goethe's Faust	3	
HEBR/JWST 4203	Israeli Literature: Exile, Nation, Home	3	The goal of this requirement is to enable students to understand the current state of knowledge in at least one scientific discipline, with specific reference to important past discoveries and the directions of current development; to gain experience in scientific observation and measurement, in organizing and quantifying results, in drawing conclusions from data and in understanding the uncertainties and limitations of the results; and to acquire sufficient general scientific vocabulary and methodology to find additional information about scientific issues, to evaluate it critically and to make informed decisions.
HEBR/JWST 4301	Venice: The Cradle of European Jewish Culture	3	
HIND 3851	Devotional Literature in South Asia	3	
HUMN 4170	Fiction and Reality: Literature, Science, and Culture	3	
HUMN/ITAL 4140	The Age of Dante: Readings from The Divine Comedy	3	
HUMN/ITAL 4150	Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages	3	The natural science requirement, which consists of passing 13 credit hours of approved natural science course work, includes one two-semester sequence of courses and at least 1 credit hour of an associated lab or field experience. No more than two lower-division courses may be taken from any single department (1-credit-hour lab/field experience courses are excepted). To fulfill the natural science core requirement the lab/field experience courses must be affiliated with a natural science lecture course. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of <i>D-</i> or higher.
HUMN/RUSS 4811	19th Century Russian Literature	3	
HUMN/RUSS 4821	20th Century Russian Literature and Art	3	
ITAL 4145	The Age of Dante in Italian	3	
ITAL 4147	Visualizing Dante's Inferno: A Global Seminar in Florence Italy	3	
ITAL 4600	Once Upon a Time in Italy	3	
JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture	3	Students who graduate with a major in the natural sciences (astrophysical and planetary sciences, biochemistry, chemistry, ecology and evolutionary biology, geology, integrative physiology, molecular, cellular and developmental biology or physics) or students who graduate with a minor in ecology and evolutionary biology are exempt from completing the natural science requirement.
JWST/RUSS 4401	The Russian Jewish Experience	3	
MUEL 3822	Words and Music	3	
MUEL 3832	Music in Literature	3	
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	3	Courses offered at CU Boulder that satisfy this requirement include the following:
RUSS 4831	Contemporary Russian Literature	3	
SCAN 3202	Old Norse Mythology	3	
SCAN 3203	19th & 20th Century Nordic Literature	3	
SCAN 3204	Medieval Icelandic Sagas	3	
SCAN 3205	Scandinavian Folk Narrative	3	
SCAN 3506	Scandinavian Drama	3	
SPAN 3260	Late 19th and 20th Century Argentine Narrative	3	
SPAN 3700	Selected Readings: Spanish Literature in Translation	3	
SPAN 3800	Selected Readings: Latin American Literature in Translation	3	
THTR 3011	American Musical Theatre History	3	

8. Natural Science (13 credit hours, including a two-course sequence and a laboratory or field experience)

These courses study the nature of matter, life and the universe. They enhance literacy and knowledge of one or more scientific disciplines, and enhance those reasoning and observing skills that are necessary to evaluate issues with scientific content. Courses are designed to demonstrate that science is not a static list of facts, but a dynamic process that leads to knowledge. This process is one of subtle interplay between observation, experimentation and theory, enabling students to develop a critical view toward the conclusions and interpretations obtained through the scientific process.

Two-semester Sequences

(Note: Although not recommended, the first semester of a sequence may be taken as a single course. Also, some sequences have included, corequisite or optional laboratories.)

- ANTH 2010¹ and ANTH 2020¹ (optional labs ANTH 2030¹, ANTH 2040¹)
- ASTR 1000 and ASTR 1020 (sequence does not include a lab)
- ASTR 1010 and ASTR 1020 (lab included in ASTR 1010)
- ASTR 1030¹ and ASTR 1040¹ (lab included in ASTR 1030)
- ATOC 1050¹ and ATOC 1060 (optional lab ATOC 1070¹)
- CHEM 1011¹ and CHEM 1031 (lab included in CHEM 1031)
- CHEM 1113 and CHEM 1133 (corequisite labs CHEM 1114 and CHEM 1134)
- CHEM 1400 and CHEM 2100 (corequisite labs CHEM 1401 and CHEM 2101)
- EBIO 1030 and EBIO 1040 (optional lab EBIO 1050)
- EBIO 1210¹ and EBIO 1220¹ (optional labs EBIO 1230, EBIO 1240)
- GEOG 1001¹ and GEOG 1011¹ (lab included)
- GEOL 1010¹ and GEOL 1020¹ (optional lab GEOL 1030¹)
- GEOL 1010¹ and GEOL 1040 (optional lab GEOL 1030¹)
- GEOL 1010¹ and GEOL 1060 (optional lab GEOL 1030¹)
- MCDB 1030¹ and MCDB 1041¹ (corequisite lab MCDB 1043)

- MCDB 1150¹ and MCDB 2150¹ (optional labs MCDB 1151¹, MCDB 2151¹)
- PHYS 1010¹ and PHYS 1020¹ (lab included in PHYS 1020)
- PHYS 1110¹ and PHYS 1120¹ (optional lab PHYS 1140¹)
- PHYS 2010¹ and PHYS 2020¹ (lab included)

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Nonsequence Courses

ANTH 3000	Primate Behavior	3
ANTH 3010	The Human Animal	3
AREN 2110	Thermodynamics	3
ASTR 1200	Stars and Galaxies (formerly ASTR 1120)	3
ASTR 2000	Ancient Astronomies of the World	3
ASTR 2010	Modern Cosmology-Origin and Structure of the Universe	3
ASTR 2020	Space Astronomy and Exploration	3
ASTR 2030	Black Holes	3
ASTR/GEOL 2040	The Search for Life in the Universe	3
ATOC 3050	Principles of Weather	3
ATOC/GEOL 3070	Introduction to Oceanography	3
ATOC 3300/ GEOG 3301	Analysis of Climate and Weather Observations	3
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution (formerly ATOC 3500/ CHEM 3500)	3
ATOC/ENVS 3600/GEOG 3601	Principles of Climate	3
ATOC 4550	Mountain Meteorology	3
ATOC 4700	Weather Analysis & Forecasting	3
ATOC 4750	Desert Meteorology and Climate	3
ATOC 4770	Wind Energy Meteorology	3
CHEM 1021	Introductory Chemistry (lab included) ¹	4
CHEM 1400	Foundations of Chemistry	4
EBIO 3180	Global Ecology	3
ENVS 1000	Introduction to Environmental Studies	4
ENVS/PHYS 3070	Energy and the Environment	3
ENVS/GEOL 3520	Energy and Climate Change: An Interdisciplinary Approach	3
GEOG 3511	Introduction to Hydrology	4
GEOG/GEOL 4241	Principles of Geomorphology (lab included)	4
GEOL 2100	Environmental Geology	3
GEOL 3040	Global Change: The Recent Geological Record	3
GEOL 3720	Evolution of Life: The Geological Record	3
GEOL 3950	Natural Catastrophes and Geologic Hazards	3
IPHY 2420	Nutrition for Health and Performance	3
IPHY 3660	Dynamics of Motor Learning	3
MCDB 3150	Biology of the Cancer Cell	3

MCDB 3330	Evolution and Creationism	3
PHIL 1400	Philosophy and the Sciences ¹	3
PHIL 3410	History of Science: Ancients to Newton	3
PHIL 3430	History of Science: Newton to Einstein	3
PHYS 1230	Light and Color for Nonscientists	3
PHYS 1240	Sound and Music ¹	3
PSYC 2012	Biological Psychology ¹	3
PHYS/EDUC 1580	Energy and Interactions	3
SLHS 2010	Science of Human Communication	3

One-credit-hour Lab/Field Courses

(NOTE: Each course below has a prerequisite or corequisite.)

ANTH 2030	Laboratory in Biological Anthropology 1 ¹	1
ANTH 2040	Laboratory in Biological Anthropology 2 ¹	1
ATOC 1070	Weather and the Atmosphere Laboratory ¹	1
CHEM 1114	Laboratory in General Chemistry 1	1
CHEM 1134	Laboratory in General Chemistry 2	1
CHEM 1401	Foundations of Chemistry Lab	1
EBIO 1050	Biology: A Human Approach Laboratory	1
EBIO 1230	General Biology Laboratory 1	1
EBIO 1240	General Biology Laboratory 2	1
GEOL 1030	Introduction to Geology Laboratory 1 ¹	1
MCDB 1043	Exploring Genetics Laboratory	1
MCDB 1151	Introduction to Cell and Molecular Biology Lab ¹	1
MCDB 2151	Principles of Genetics Laboratory ¹	1
PHYS 1140	Experimental Physics 1 ¹	1

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, <http://highered.colorado.gov/Academics/Transfers/gtPathways/curriculum.html> (<http://highered.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

9. Contemporary Societies (3 credit hours)

All individuals function within social frameworks. Courses in contemporary societies introduce students to the study of social groups, including social institutions and processes, the values and beliefs shared by their members and the forces that mold and shape social groups.

They prepare students to approach social phenomena of all kinds in an informed and critical way, and to describe, analyze, compare and contrast them. Such study also provides students with new vantage points from which to view their own sociocultural assumptions and traditions.

These courses, which treat contemporary societies, study an individual society or compare several societies. All explicitly attempt to deepen the students' understanding of the cultural, political, economic or social contexts that shape people's lives. Their scope may be global or specific, but all courses that fulfill this requirement address social processes, institutions, values, forces and beliefs.

Students who graduate with a major in anthropology, economics, international affairs, political science, psychology or sociology are exempt from the contemporary societies requirement. Students may satisfy this 3-credit-hour requirement by passing any course listed below. Students who take approved CU Boulder course work to fulfill this

requirement must take the course for a letter grade and receive a passing grade of *D-* or higher.

ANTH 1200	Culture and Power	3
BAKR 1600	Creating a Sustainable Future	3
COMM 1210	Perspectives on Human Communication	3
ECON 2010	Principles of Microeconomics	4
ECON 2020	Principles of Macroeconomics	4
ECON 3403	International Economics and Policy	3
ECON 3535	Natural Resource Economics	3
ECON 3545	Environmental Economics	3
EDUC 3013	School and Society	3
ETHN 1025	Introduction to Asian American Studies	3
ETHN 2232	Contemporary African American Social Movements	3
ETHN 2242	African American Social and Political Thought	3
ETHN 3015	Asian Pacific American Communities	3
GEOG 3742	Place, Power, and Contemporary Culture	3
GRMN 1601	Germany Today	3
HIST 2126	Issues in Modern U.S. Politics and Foreign Relations	3
HIST 2166	The Vietnam Wars	3
HUMN 4835	Literature and Social Violence	3
IAFS 1000	Global Issues and International Affairs	4
IAFS 3520/ JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel	6
INVS 3000	Innovative Approaches to Contemporary Issues through Service Learning	3-4
INVS 4302/ PSCI 4732	Critical Thinking in Development	3
ITAL 1500	That's Amore: Introduction to Italian Culture	3
ITAL 4290	Italian Culture Through Cinema	3
LIBB 2100	Russian Revolutions: Social and Artistic	3
LING 1000	Language in U.S. Society	3
MUEL 3882	Music and Violence	3
PORT 2800	Brazil: Past and Present	3
PRLC 1820	Community Issues in Leadership	3
PSCI 1101	Introduction to American Politics	3
PSCI 2012	Introduction to Comparative Politics	3
PSCI 2223	Introduction to International Relations	3
PSCI 3022	Russian Politics	3
PSCI 3032	Democracy, Inequality and Violence in Latin America	3
PSCI 3074	Democracy and Its Citizens in the US and EU	3
PSCI 3082	Political Systems of Sub-Saharan Africa	3
PSCI 3143	Current Affairs in International Relations	3
PSCI 4002	Western European Politics	3
PSCI 4012	Global Development	3
PSCI 4062	East European Politics	3
PSYC 2606	Social Psychology	3
RLST 1850	Ritual and Media	3
RLST 2400	Religion and Contemporary Society	3
RUSS 2501	Russia Today	3

RUSS 3333	Spies Like Us: Espionage in the Culture of the Cold War and Beyond	3
RUSS 4831	Contemporary Russian Literature	3
SCAN 2201	Introduction to Modern Nordic Culture and Society	3
SCAN 3201	Contemporary Nordic Society and Culture	3
SLHS 1010	Disabilities in Contemporary American Society	3
SOCY 1001	Introduction to Sociology	3
SOCY 4024	Juvenile Justice and Delinquency	3
WGST 2600	Gender, Race, and Class in a Global Context	3

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html (<http://higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>).

10. Ideals and Values (3 credit hours)

Ideals and values have usually been determined by long-standing traditions and fixed social practices. In our modern world, the interaction of different cultures, movement from place to place, electronic media and the rapidity of change, even within a given society, have combined to generate new constellations of ideals and hard choices among values.

Courses meeting the ideals and values requirement inquire into some specific sphere of human value (e.g. moral, religious, intellectual, aesthetic, environmental, etc.). In these courses students are encouraged to reflect upon fundamental ideals and values, their own and others, and the sources from which those value orientations derive. Such inquiry demands the development of the critical skills which help students identifying the assumptions and ramifications of value structures. It also requires consideration of approaches by which value systems are constructed, justified and applied, especially in regard to personal, societal and in some cases cross-cultural contexts.

Students may complete this 3-credit-hour requirement by passing any course listed below. Students who take approved CU Boulder course work to fulfill this requirement must take the course for a letter grade and receive a passing grade of *D-* or higher.

ARSC/NRLN 2000	Ways of Knowing: Constructions of Knowledge in the Academy and Beyond	3
CLAS/RLST 2610	Paganism to Christianity	3
CWCV 2000	The Western Tradition	3
ENGL/HUMN/ JWST 3310	The Bible as Literature (formerly ENGL 3312/JWST 3312)	3
ENVS/PHIL 3140	Environmental Ethics	3
FARR 2510	Exploring Good and Evil through Film	3
FARR 2660/ HONR 2250	Ethics of Ambition	3
FARR 2820	Future of the Spaceship Earth	3
FREN 4860	War, Trauma, and Memory: Amnesias, Revisions, and Representations of Traumatic History (formerly FREN 4000)	3
GRMN/HUMN 1701	Nature and Environment in German Literature and Thought	3
GRMN/JWST 2502	Representing the Holocaust	3

GRMN 2603	Moral Dilemmas in Philosophy and Literature (formerly GRMN 1603)	3
GRMN/HUMN 3505	The Enlightenment: Tolerance and Emancipation	3
GRMN/HUMN 4502	Nietzsche: Literature and Values	3
HUMN 4155	Philosophy, Art, and the Sublime	3
INVS 1000	Responding to Social and Environmental Problems Through Service Learning ¹	4
ITAL 1300	La Dolce Vita: Why the Humanities Matter, Italian Style	3
JWST 1234	Mysticism and the Jewish American Literary Tradition	3
JWST/RLST 2600	Judaism, Christianity, and Islam ¹	3
LIBB 1500	The Dialogue of Art and Religion	3
LIBB 2013	Film and the Quest for Truth (formerly FILM 2013)	3
PHIL 1000	Introduction to Philosophy ¹	3
PHIL 1100	Ethics ¹	3
PHIL 1160	Introduction to Bioethics	3
PHIL 1200	Contemporary Social Problems ¹	3
PHIL 1600	Philosophy and Religion ¹	3
PHIL 2200	Major Social Theories	3
PHIL 3100	Ethical Theory	3
PHIL/WGST 3110	Feminist Practical Ethics	3
PHIL 3160	Bioethics	3
PHIL 3190	War and Morality	3-4
PHIL 3200	Social and Political Philosophy	3
PHIL 3260	Philosophy and the International Order	3
PHIL 3600	Philosophy of Religion	3
PRLC 1810	Ethical Leadership	3
PSCI 2004	Survey of Western Political Thought ¹	3
PSCI 3054	American Political Thought	3
PSCI 3064	Environmental Political Theory	3
RLST 1620	Religious Dimension in Human Experience	3
RLST 2202	Islam	3
RLST 2500	Religions in the United States ¹	3
RLST 2610	Religions of India	3
RLST 2620	Religions of East Asia ¹	3
RLST 2700	American Indian Religious Traditions ¹	3
RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World	3
RUSS 4221	Stalinism: Society and Culture	3
SCAN 3301	Radical Nationalism in Contemporary Northern Europe	3
SEWL 2000	America, the Environment, and the Global Economy	3
SOCY 1004	Deviance in U.S. Society ¹	3
SOCY 1022	Ethics and Social Issues in U.S. Health and Medicine	3
SOCY 2031	Social Problems ¹	3
SOCY 2077	Environment and Society	3
SOCY 3151	Self in Modern Society	3
SOCY 4121	Sociology of Religion	3

¹ NOTE: This course is approved for the Colorado statewide guaranteed transfer program. Further information about the statewide guaranteed transfer program can be found at the website of the Colorado Commission on Higher Education, higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html. (<http://higher.ed.colorado.gov/Academics/Transfers/gtPathways/curriculum.html>)

Arts & Sciences

The College of Arts & Sciences is the liberal arts college at CU Boulder. Its mission is to provide an outstanding liberal arts education for its undergraduates, cutting-edge graduate education and world-class research, scholarship and creative work. In addition to gaining the knowledge and skills of their areas of study, students learn how new information is acquired and can participate in original research and creative work with individual faculty members.

The college offers a wide variety of fields of study, with nearly 50 undergraduate majors. The environment and advantages of a small liberal arts college are created through "academic neighborhoods" in which students can meet and interact with other students and faculty in small group settings. In addition, more than 60 percent of undergraduate classes are small, with 25 or fewer students.

As the liberal arts college of CU Boulder, the College of Arts and Sciences has several goals in the education of its students:

- Educate students for careers and a productive life. Arts and sciences students gain the most current knowledge and skills in their major fields of study. In addition, they learn how to acquire new skills to contend with-and lead-the changes that will occur in the decades to come. Education for a productive life also requires that students learn how to analyze situations, solve problems and speak and write effectively.
- Provide students with a well-rounded education. Arts and sciences students acquire a broad knowledge and an integrated understanding of art and music, great literary works, philosophy, history and politics, the social world, science and technology. They learn how to critically evaluate and think about morals, ethics and values. The core curriculum and breadth requirements give students a broad, liberal-arts education that develops the whole person, not just the specialist.
- Educate citizens who can think for themselves, understand the rapidly changing world and make wise choices within a democratic system.
- Impart a love of learning so that students can continue to grow throughout life.
- Teach ways of thinking about and approaching new problems. For some students, this will enable them to further advance knowledge and scholarship in the academy. For all students, this is important for enriching their lives.
- Prepare students to help enrich the lives of others. Arts and sciences graduates become lifelong resources for their families, neighbors, friends and co-workers.

The college is also dedicated to outstanding graduate education. Advanced degrees are offered by nearly every academic department in the college, and the PhD is offered in approximately 30 different disciplines. In addition, an increasing number of departments offer combined bachelor's/master's degrees that can be earned in five years.

Graduate training focuses on teaching and research careers as well as on professional careers in the public and private sector.

The strength of the College of Arts and Sciences comes from its outstanding faculty. In addition to being dedicated teachers, they are active scholars in disciplines throughout the arts and humanities, social and behavioral sciences, biological sciences and physical and mathematical sciences. They are the recipients of numerous national awards and honors for their research, scholarship and creative work. Faculty and staff of the College of Arts and Sciences join together to create an intellectual community of students and scholars to discover, critically examine, integrate, preserve and transmit knowledge, wisdom and values.

Honors Program

The Arts and Sciences Honors Program provides a community for highly motivated and academically prepared undergraduate students and offers opportunities for intellectual engagement through honors courses, academic-inspired events, and honors thesis research and creative work.

The Honors Program is a program of excellence in which the best teaching faculty are committed to serving the most highly motivated students. The Honors Program offers the opportunity to work closely with faculty, to engage with other honors students (<http://www.colorado.edu/honors/community>) and to write an honors thesis. Honors offers over 50 courses per year (<http://www.colorado.edu/honors/courses>) in a wide variety of areas. Honors courses are limited to an enrollment of approximately 15 students.

Incoming first-year students are invited to participate (<http://www.colorado.edu/honors/admission>) in the Honors Program based on multiple criteria that are set by the Office of Admissions. Transfer students must have a 3.3 GPA or better from their previous school. Currently enrolled students are eligible based on their academic achievement at CU Boulder and are expected to have a 3.3 GPA or better.

Latin honors (<http://www.colorado.edu/honors/graduation>) in the College of Arts and Sciences are conferred by the Honors Program. Students who wish to graduate *cum laude*, *magna cum laude* or *summa cum laude* must write and defend an honors thesis and maintain a certain GPA. Most students pursue Latin honors in their major (based on departmental requirements), but students may also pursue General Honors (<http://www.colorado.edu/honors/generalhonors>) via the Honors Program, providing students the opportunity to write an interdisciplinary thesis.

The Honors Residential Academic Program (Honors RAP (<http://www.colorado.edu/hrap>)) is the optional residential component of the program. Honors RAP is open to a limited number of qualified incoming and continuing students. Students engage in small classes and co-curricular activities, forming an academic community in their residence hall.

Faculty

Hickcox, Abby Lynn (https://experts.colorado.edu/display/fisid_151860)
Instructor; PhD, University of Colorado Boulder

Jacobs, Janet L (https://experts.colorado.edu/display/fisid_100744)
PhD, University of Colorado Boulder

Jones, Daniel C L. (https://experts.colorado.edu/display/fisid_105705)
Senior Instructor; PhD, University of Colorado Boulder

Kopff, E Christian (https://experts.colorado.edu/display/fisid_100649)
Associate Professor; PhD, University of North Carolina Chapel Hill

Strom, Paul (https://experts.colorado.edu/display/fisid_106128)
Senior Instructor; PhD, University of Denver

The Miramontes Arts and Sciences Program (MASP) is a community of diverse scholars dedicated to academic achievement. MASP accepts highly motivated students with strong academic records who are also members of traditionally underrepresented groups and/or are first-generation college students. MASP supports students through mentoring, instruction, skills workshops, enrichment opportunities, community activities, and participation scholarships.

For most members of MASP, support begins the summer before freshman year with the Program for Excellence in Academics and Community (PEAC), a summer residential program that helps first year students transition to the University. PEAC is an intensive and challenging academic program where students take a rigorous set of non-credit classes, learn valuable skills for academic success, are introduced to resources and opportunities on campus and in the College of Arts & Sciences, and participate in advanced enrichment and community-building activities. Continuing students interested in MASP can also apply through our MASP affiliate program.

Students receiving a participation scholarship in MASP commit to participating in a range of programming that include one-credit hour seminars on unique and advanced topics in Arts & Sciences, research colloquia where they meet and network with faculty members, skills workshops, and community conversations. Students are encouraged to participate in undergraduate research and/or other scholarly activities such as internships and study abroad programs. MASP students are also required to be involved with our community space and to participate in community activities to help develop a strong sense of group cohesiveness and spirit. And MORE!

For more information, call the MASP office at **303-492-8229**.

Actuarial Studies and Quantitative Finance

The Actuarial Studies and Quantitative Finance Certificate Program is an interdisciplinary undergraduate certificate program housed in the College of Arts and Sciences Departments of Mathematics, Applied Mathematics and Economics; and the Leeds School of Business, that is designed to provide the foundation for a lifetime of analytical problem solving. The Program appeals to accomplished students who enjoy solving analytic problems as applied in their career of choice. Students with these skills and interests are in high demand in the business world which becomes more analytical and mathematical every year. In addition, successful candidates will be well-prepared for further study at the graduate level.

Certificate

- Actuarial Studies and Quantitative Finance - Certificate (p. 143)

Actuarial Studies and Quantitative Finance - Certificate

The Actuarial Studies and Quantitative Finance Certificate Program offers two tracks:

- Actuarial Studies Track
- Quantitative Finance Track

Actuarial Studies Track

The actuarial studies track, offered by the College of Arts and Sciences, is designed to help students obtain the expertise in mathematics, economics and finance necessary to become actuaries—the mathematical planners of the insurance and pension industries.

Students in the program can be of any major or college, or can be classified as nondegree. The entrance requirement is three semesters of calculus completed with grades of B+ or better. There are a number of courses in mathematics, economics and business required to earn the certificate. The certificate is awarded by the dean of the College of Arts and Sciences.

Besides taking courses, students are encouraged to take the professional exams offered by the various actuarial societies. The entrance requirements can be waived for students who pass the first actuarial examination.

Interested students should contact one of the co-directors: David Grant at 303-492-7208 or Anne Dougherty at 303-492-4011, who will also provide advice on actuarial studies to students who are not in the program. For more information, visit the Actuarial Studies and Quantitative Finance Certificate Program (<http://www.colorado.edu/asqf>) webpage.

Quantitative Finance Track

The quantitative finance track, offered jointly by the College of Arts and Sciences and the Leeds School of Business, was initiated in the fall of 2004 and is designed to prepare students for financial and economics analyst positions that require outstanding quantitative skills. Often employers hire graduate students for such positions due to a shortage of undergraduates with the required combination of skills and training. This program is designed to meet this need.

The required curriculum is extensive and rigorous. Potential participants are encouraged to begin work early in their studies, preferably during the first year. Course work draws from the Departments of Mathematics, Applied Mathematics and Economics; and the Leeds School of Business. Qualified students enrolled in any college are invited to participate.

For admittance to the program, a student must earn a GPA of 2.87 or higher in Calculus I through III. However, students may be provisionally admitted after completion of Calculus I (MATH 1300 or APPM 1350) with a grade of B or better or through advanced placement. Additional GPA requirements must be met to earn the certificate. Participants may be given preference when enrolling in certain courses in the Leeds School of Business.

Interested students should contact Daniel Brown, Leeds School of Business, at daniel.brown@colorado.edu. For more information, visit the Actuarial Studies and Quantitative Finance Certificate Program (<http://www.colorado.edu/asqf>) webpage.

Requirements

Curricula are rigorous and multi-disciplinary, with required course work drawing from the Mathematics, Applied Mathematics, and the Economics Department, as well as the Finance Division of the Leeds School of Business. The confluence of such widely varying material is one of the unique features of the program. Successful completion of the program requirements is a significant accomplishment.

Actuarial Studies Track

The courses listed below are the minimum required in order to complete the Actuarial Studies track of our program. You must score a C- or better in all courses (VEE courses need B- or better for VEE credit).

Required Courses and Semester Credit Hours

Required Mathematics Courses

MATH 1300	Calculus 1	4-5
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
or APPM 2350	Calculus 3 for Engineers	
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	3
or APPM 3310	Matrix Methods and Applications	
MATH 4510	Introduction to Probability Theory	3
or APPM 3570	Applied Probability	
MATH/APPM 4520	Introduction to Mathematical Statistics	3
MATH/APPM 4540	Introduction to Time Series	3

Required Economics Course

ECON 3070	Intermediate Microeconomic Theory	4
ECON 3080	Intermediate Macroeconomic Theory	3
ECON 4070	Topics in Microeconomics	3

Required Finance/Accounting Courses

BCOR 2002	Principles of Accounting and Finance	3
FNCE 3010	Corporate Finance	3

Additional Recommended Courses

APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	3
APPM 4570	Statistical Methods	3
APPM 4580	Introduction to Statistical Learning	3
ECON 3818	Introduction to Statistics with Computer Applications	4
ECON 4818	Introduction to Econometrics	3
FNCE 3030	Investment and Portfolio Management	3
FNCE 4040	Derivative Securities	3
MATH/APPM 4120	Introduction to Operations Research	3
MATH/APPM 4650	Intermediate Numerical Analysis 1	3

Quantitative Finance Track

Program requirements are extensive and challenging. Students must meet two separate GPA requirements:

1. The overall GPA for all courses applied to certificate requirements must be at least 3.00.
2. Students must meet a requirement specifically for mathematics and statistics courses applied to certificate requirements. This requirement can be met one of two ways, either by achieving a GPA of 2.87 or greater in calculus courses or a GPA of 3.00 or greater in the six mathematics and statistics courses required for the certificate.

Most students will begin study during their freshman year and continue throughout their undergraduate career. The number of credit hours taken may vary according to the specific courses completed.

The courses listed below are the minimum required in order to complete the Quantitative Finance track of our program. Please note that students must pass Calculus I, II, and III with a B grade or better in order to be admitted into the program. Students are encouraged to go beyond the minimum requirements, and most students do.

Required Courses and Semester Credit Hours

Required Mathematics Courses

MATH 1300	Calculus 1	5-4
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	5-4
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
or APPM 2350	Calculus 3 for Engineers	
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	3
or APPM 3310	Matrix Methods and Applications	
MATH 4510	Introduction to Probability Theory	3
or APPM 3570	Applied Probability	
MATH/APPM 4520	Introduction to Mathematical Statistics	3

Required Economics Course

ECON 2010	Principles of Microeconomics	4
ECON 2020	Principles of Macroeconomics	4
ECON 3070	Intermediate Microeconomic Theory	4
ECON 4818	Introduction to Econometrics	3

Required Finance/Accounting Courses

ACCT 3220	Corporate Financial Reporting 1	3
BCOR 2000	Accounting and Financial Analysis	4
BCOR 2200	Introductory Finance	3
FNCE 3010	Corporate Finance	3
FNCE 3030	Investment and Portfolio Management	3
FNCE 4040	Derivative Securities	3
FNCE 4820	Topics in Finance	3

Additional Recommended Courses (Choose One)

ACCT 3230	Corporate Financial Reporting 2	3-4
APPM 2360	Introduction to Differential Equations with Linear Algebra	
APPM 2750	Java: Training, Mathematical Algorithms, and Mobile Apps	
APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	
CSCI 1300	Computer Science 1: Starting Computing	
FNCE 4830	Seminar in Investment Banking	

FNCE 4820	Topics in Finance
FNCE 4050	Capital Investment Analysis
MATH/APPM 4540	Introduction to Time Series
Total Credit Hours	63-62

For a complete list of requirements and further information regarding the quantitative finance track and the related actuarial studies track, see the Actuarial Studies Program website. Interested students should contact Daniel Brown, daniel.brown@colorado.edu (Daniel.Brown@colorado.edu), Leeds School of Business.

Anthropology

Anthropology is the study of people, both ancient and modern, in their cultural, biological, and environmental contexts. The discipline incorporates a wide range of theoretical and methodological traditions, drawing on and contributing to approaches in the humanities, social sciences, and natural sciences. We assert that the diversity of anthropology is the source of both its uniqueness and its greatest strength as a discipline. As the only field to address all aspects of the human experience – cultural, biological, historical – anthropology provides both a broad vision of what it is to be human as well as creative synergies unavailable to other disciplines within the human sciences and humanities. We view the subdisciplines of cultural anthropology, archaeology, and biological anthropology as important foundations of our program because of their well-defined fields of study. Yet we also believe that recent trends in anthropological thought offer creative new directions that cut across and bridge the subdisciplines.

We see our long-term vision as a department coalescing around the theme of local/global dynamics; that is, the relationship between the small-scale of the lives of our subjects of study as cultural and biological beings, and the large-scale patterns of society and history. While addressed from different theoretical orientations and methodologies, all anthropologists struggle with the problem of understanding the relationship of the local to the global. We have identified four perspectives that address local/global dynamics in ways that cut across the subdisciplines: ecology and evolution, power and practice, globalization, and landscape and space. These intellectual bridges will create powerful new collaborations within the department and with other programs that will advance our research and teaching missions as well as create a more integrated departmental vision.

Course code for this program is ANTH.

Bachelor's Degree

- Anthropology - Bachelor of Arts (BA) (p. 152)

Minor

- Anthropology - Minor (p. 152)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bamforth, Douglas (https://experts.colorado.edu/display/fisid_101027)
PhD, University of California-Santa Barbara

Bernstein, Robin Miriam (https://experts.colorado.edu/display/fisid_152968)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Cameron, Catherine M (https://experts.colorado.edu/display/fisid_108375)
Professor; PhD, University of Arizona

Cool, Alison Collier (https://experts.colorado.edu/display/fisid_154599)
Assistant Professor; PhD, New York University

Covert, Herbert H (https://experts.colorado.edu/display/fisid_101542)
Professor; PhD, Duke University

Deluca, Laura M (https://experts.colorado.edu/display/fisid_101414)
Asst Professor Adjunct

Dufour, Darna L (https://experts.colorado.edu/display/fisid_100213)
Professor; PhD, SUNY at Binghamton

Eddy, Frank W.
Professor Emeritus

Goldfarb, Kathryn Elissa (https://experts.colorado.edu/display/fisid_156471)
Assistant Professor; PhD, University of Chicago

Goldstein, Donna M (https://experts.colorado.edu/display/fisid_100448)
Professor; PhD, University of California-Berkeley

Greene, David Lee
Professor Emeritus

Gutierrez, Gerardo (https://experts.colorado.edu/display/fisid_146867)
Associate Professor; PhD, Pennsylvania State University

Hammons, Christian Stanford (https://experts.colorado.edu/display/fisid_152915)
Instructor; PhD, University of Southern California

Jacka, Jerry Keith (https://experts.colorado.edu/display/fisid_156067)
Assistant Professor; PhD, University of Oregon

Jones, Carla Mae (https://experts.colorado.edu/display/fisid_134172)
Associate Professor; PhD, University of North Carolina Chapel Hill

Joyce, Arthur A (https://experts.colorado.edu/display/fisid_115421)
Professor; PhD, Rutgers University New Brunswick

Kaschube, Dorothea V.
Professor Emeritus

Kelso, Alec J.
Professor Emeritus

Lambert, Joanna E (https://experts.colorado.edu/display/fisid_156206)
Professor; PhD, University of Illinois at Urbana-Champaign

Leigh, Steven Robert (https://experts.colorado.edu/display/fisid_151706)
Professor; PhD, Northwestern University

Lekson, Steve (https://experts.colorado.edu/display/fisid_108312)
Professor; PhD, University of New Mexico

McCabe, J Terrence (https://experts.colorado.edu/display/fisid_100063)
Professor; PhD, SUNY at Binghamton

McGilvray, Dennis B.
Professor Emeritus

McGoodwin, James Russell
Professor Emeritus

McGranahan, Carole Ann (https://experts.colorado.edu/display/fisid_122673)
Associate Professor; PhD, University of Michigan Ann Arbor

Ortman, Scott Graham (https://experts.colorado.edu/display/fisid_152978)
Assistant Professor; PhD, Arizona State University

Roland, Lorecia Kaifa-Aliya (https://experts.colorado.edu/display/fisid_143551)
Associate Professor; PhD, Duke University

Sauther, Michelle Linda (https://experts.colorado.edu/display/fisid_107236)
Professor; PhD, Washington University

Scanlan-Lyons, Colleen M. (https://experts.colorado.edu/display/fisid_148419)
Asst Professor Adjunct

Shankman, Paul
Professor Emeritus

Shannon, Jennifer A. (https://experts.colorado.edu/display/fisid_147612)
Associate Professor; PhD, Cornell University

Sponheimer, Matthew James (https://experts.colorado.edu/display/fisid_129957)
Professor; PhD, Rutgers University New Brunswick

Stein, Lara C (https://experts.colorado.edu/display/fisid_156437)
Asst Professor Adjunct

Van Gerven, Dennis P.
Professor Emeritus

Walker, Deward E. Jr
Professor Emeritus

Williams, Bianca Christel (https://experts.colorado.edu/display/fisid_147342)
Associate Professor; PhD, Duke University

ANTH 1030 (3) Principles of Anthropology 1

Evolution of humanity and culture from beginnings through early metal ages. Covers human evolution, race, prehistory, and rise of early civilizations. This course is taught through Continuing Education.

Additional Information: MAPS Course: Social Science

ANTH 1040 (3) Principles of Anthropology 2

Surveys the world's major culture areas. Covers components of culture, such as subsistence, social organization, religion, and language. This course is taught through Continuing Education.

Additional Information: MAPS Course: Social Science

ANTH 1100 (3) Exploring a Non-Western Culture: The Tamils

Surveys the social and economic patterns, ideas and values, and aesthetic achievements of the Tamils, a Hindu people who live in South India and Sri Lanka.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asia Content

ANTH 1105 (3) Exploring a Non-Western Culture: Tibet

Introduction to Tibetan culture, history, religion, and society from an anthropological perspective, including traditional as well as contemporary dimensions. Topics will include Tibetan Buddhism, politics, nomadism, gender, refugee issues, and the global Tibetan diaspora, all framed within the larger methods and concepts of cultural anthropology.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asia Content

ANTH 1115 (3) The Caribbean in Post-Colonial Perspective

Introduces the student to the varied peoples and cultures in the Caribbean region, emphasizing the historical, colonial, and contemporary political-economic contexts of their social structure and cultural patterns.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1120 (3) Exploring a Non-Western Culture: Hopi and Navajo

Explores two American Indian cultures, Hopi and Navajo and cultural interrelationships from the prehistoric through the contemporary period, using an integrated, holistic and humanistic viewpoint.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 1123

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1135 (3) Exploring Cultural Diversity

Examines the geography, kinship, politics and religious values of a various cultures in historical and contemporary context through an anthropological perspective. Check with department for semester offerings.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1140 (3) Exploring a Non-Western Culture: The Maya

Explores the culture of the Maya of Central America, emphasizing their material adaptations, social organizations, ideals and values, and artistic achievements in the past and the present.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1145 (3) Exploring a Non-Western Culture: The Aztecs

Explores the culture of the Aztec people of Central Mexico: their subsistence, society, religion, and achievements, as well as the impact of the Aztec empire in Mesoamerica. Also reviews the clash of a non-western society with the western world with the arrival of the Spanish conquistadors.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1150 (3) Exploring a Non-Western Culture: Regional Cultures of Africa

Explores a small number of cultures in a specific sub-region of Africa from an integrated holistic viewpoint, emphasizing material adaptations, social patterns, ideas and values, and aesthetic achievements.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1170 (3) Exploring Culture and Gender through Film

Explores the concepts of culture and gender from an anthropological perspective, using films and other media, as well as written texts.

By analyzing media about other ways of life, students will learn the basic concepts of cultural anthropology and be able to apply them to any society. In addition, students will learn to think critically about documentary and ethnographic media.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1180 (3) Maritime People: Fishers and Seafarers

Explores important milestones in the development of human societies and cultures that live from the sea. Emphasizes the evolution of maritime adaptations associated with fishing and seafaring from more than 10,000 years ago through the present.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 1190 (3) Origins of Ancient Civilizations

Examines origins of the world's first civilizations in Mesopotamia, Egypt, the Indus Valley, Mesoamerica, and the Andes. Covers archaeology of ancient cities, trade, economy, politics, warfare, religion, and ideology. Seeks insights into general processes of cultural evolution.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 1200 (3) Culture and Power

Compares contemporary sociopolitical systems across cultures, from non-Western tribal groups to modern states. Introduces students to anthropological approaches for understanding and analyzing political forces, processes, and institutions that affect cultures such as colonialism, warfare, violence, ethnicity, migration, and globalization.

Additional Information: Arts Sci Core Curr: Contemporary Societies

ANTH 2010 (3) Introduction to Biological Anthropology 1

Detailed consideration of human biology, the place of humans in the animal kingdom, primate ecology and fossil evidence for human evolution. Required for ANTH majors.

Additional Information: GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Natural Science

ANTH 2020 (3) Introduction to Biological Anthropology 2

Continuation of ANTH 2010. Emphasizes genetics, human variation, and microevolution.

Recommended: Prerequisite ANTH 2010.

Additional Information: GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

ANTH 2030 (1) Laboratory in Biological Anthropology 1

Lab in human osteology and musculoskeletal system emphasizing comparative primate morphology, adaptation, and the fossil record documenting the natural history of primates. Meets the MAPS requirement for natural science: lab, when taken with ANTH 2010.

Recommended: Corequisite ANTH 2010.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

ANTH 2040 (1) Laboratory in Biological Anthropology 2

Experiments and hands-on exercises designed to enhance understanding of the principles and concepts presented in ANTH 2020. One two-hour class per week.

Recommended: Corequisite ANTH 2020.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

ANTH 2070 (3) Bones, Bodies, and Disease

Studies the human skeleton and introduces techniques used to evaluate demographic variables. Applies techniques through evaluation of photographic images of an excellently preserved mummified skeletal population from ancient Nubia to reconstruct prehistoric patterns of adaptation and biocultural evolution. Offered through Continuing Education only.

Recommended: Prerequisite ANTH 2010.

ANTH 2100 (3) Introduction to Cultural Anthropology

Covers current theories in cultural anthropology and discusses the nature of field work. Explores major schools of thought and ethnographic fieldwork in a range of cultures studied by anthropologists. Required for Anthropology majors.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 2200 (3) The Archaeology of Human History

Where do we come from? This course provides a brief introduction to the practice of archaeology and then emphasizes the evidence for major events/transitions in human history over the last 2.5 million years. Required for ANTH majors.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 2210 (1) Laboratory Course in Archaeological Methods

Studies analytical methods in archaeological research including those employed both in the field and in the laboratory. Deals with practical exercises illustrating many of the theoretical principles covered in ANTH 2200.

Recommended: Corequisite ANTH 2200.

ANTH 3000 (3) Primate Behavior

Surveys naturalistic primate behavior. Emphasizes social behavior, behavioral ecology, and evolution as they lead to an understanding of human behavior.

Requisites: Requires a prerequisite course of ANTH 2010 or EBIO 1220 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ANTH 3005 (3) Dogs, Wolves and Human Evolution

Domestication of dogs from wolves started many tens of thousands of years ago. Explores the domestication process, wild wolf behavior, dog behavior, genetics of dog breeding, the cultural significance of dogs, the complexity of human-wolf interactions in North America and Europe and dog cognition in a larger comparative framework, including chimpanzees and other primates.

Requisites: Requires a prerequisite course of ANTH 2010 or EBIO 1210 (minimum grade C-).

ANTH 3009 (3) Modern Issues, Ancient Times

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly ANTH 2009.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 3009

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 3010 (3) The Human Animal

Identifies genetic, anatomical, physiological, social, and behavioral characteristics humans share with other mammals and primates. Explores how these characteristics are influenced by modern culture.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2010.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ANTH 3100 (3) Africa: Peoples and Societies in Change

Examines culture and politics in Africa through works by anthropologists and historians, as well as novels, films, and journalistic accounts. Special attention is devoted to the ways in which various African cultures have creatively and resiliently responded to the slave trade, European colonialism, and post-colonialism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3110 (3) Ethnography of Mexico and Central America

A broad overview, focusing on Mexico and Guatemala. Major topics include ethnohistory, indigenous and mestizo peoples, and contemporary problems and issues.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3160 (3) Peoples of the South Pacific

Surveys traditional island cultures and contemporary changes in the Pacific, focusing on how the Pacific Islands were first settled, some of the great anthropologists who studied the islanders, and how current environmental changes, such as global warming, threaten the future existence of the islands.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3170 (3) America: An Anthropological Perspective

Historical and contemporary aspects of American life are considered from an anthropological perspective.

Additional Information: Arts Sci Core Curr: United States Context

ANTH 3180 (3) Gender, Culture, and Sexuality

Focuses on gender, that is, the making of men and women, and how gender is culturally constructed in different societies. Gender describes many areas of behavior, feelings, thoughts, and fantasies that cannot be understood as primarily biologically produced. Sexuality and sexual systems are sometimes viewed as products of particular gendering practices, but recent theories suggest that sexual systems themselves constitute gender.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 3300 (3) Elements of Religion

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3301

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3760 (3) Exploring Culture and Media in Southeast Asia

Introduces students to the ethnographic method and critical media practices through immersion in the cultural politics of Indonesia. Students will learn to conduct ethnographic research and to use media-making as a research method. Students will learn the ethnography of Southeast Asia by focusing on the cultural diversity of Indonesia, with special attention to religious and political issues among marginalized groups.

Repeatable: Repeatable for up to 9.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Human Diversity

ANTH 4000 (3) Quantitative Methods in Anthropology

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5000

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ANTH 2010 and ANTH 2020.

ANTH 4020 (3-6) Explorations in Anthropology

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5045 and MUSM 5045

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Anthropology

ANTH 4050 (3) Anthropology of Jews and Judaism

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4050

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4060 (3) Nutrition and Anthropology

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5060

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ANTH 2010 and ANTH 2020 or EBIO 1210 and EBIO 1220 or EBIO 1030 and EBIO 1040.

ANTH 4070 (3) Methods in Biological Anthropology

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5070

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ANTH 2010 and ANTH 2020 and ANTH 2030 and ANTH 2040 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

ANTH 4110 (3) Human Evolutionary Biology

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4120 (3) Advanced Biological Anthropology

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5120

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2010 or ANTH 2020 or EBIO 1210 or EBIO 1220.

ANTH 4125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5125

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

ANTH 4129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5129 and ARTH 4129 and CLAS 4129 and CLAS 5129

ANTH 4130 (3) Advanced Osteology

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5130

Recommended: Prerequisites ANTH 2010 and ANTH 2020 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

ANTH 4160 (3) Early Hominin Paleocology

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5160

Grading Basis: Letter Grade

ANTH 4170 (3) Primate Evolutionary Biology

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5170

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2010 or EBIO 1210.

ANTH 4180 (3) Anthropological Perspectives: Contemporary Issues

Students read, discuss, and write critical evaluations of contemporary publications in anthropology. Identifies basic themes that inform major anthropological perspectives. Students then bring these perspectives to bear on issues currently facing the human species.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4210 (3) Southwestern Archaeology

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5210

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4220 (3) From Olmec to Aztec: The Archaeology of Mexico

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5220

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4224 (3) Archaeology of the Maya and Their Neighbors

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5224

Recommended: Prerequisite ANTH 2200.

ANTH 4240 (3) Geoarchaeology

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5240

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4270 (3) Plains Archaeology

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5270

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4330 (3) Human Ecology: Archaeological Aspects

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5330

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4340 (3) Archaeological Method and Theory

Surveys archaeological theories and methods within the context of the history of archaeology. Includes archaeological approaches to data recovery, analysis, and interpretation as well as an overview of cultural resources management and ethical issues in contemporary archaeology.

Recommended: Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

ANTH 4350 (2-6) Archaeological Field and Laboratory Research

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5350

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

ANTH 4380 (3) Lithic Analysis and Replication

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5380

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4390 (3) Research Methods in Archaeology I

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5390

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4470 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5470 and MUSM 4912 and MUSM 5912

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

ANTH 4500 (3) Cross-Cultural Aspects of Socioeconomic Development

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5500

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4505 (3) Globalization and Transnational Culture

Covers the historical foundations for contemporary global change, addressing colonialism, global outsourcing, and cultural imperialism, with a particular emphasis on gender, class, and consumerism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4525 (3) Global Islams

Examines the historical formation of Islam in Indonesia and Southeast Asia so as to situate contemporary Islamic practices in a global context.

Recommended: Prerequisite ANTH 2100.

ANTH 4530 (3) Theoretical Foundations of Sociocultural Anthropology

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5530

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4570 (3) Anthropology of Fishing

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5570

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4580 (3) The Holocaust: An Anthropological Perspective

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4580

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4610 (3) Medical Anthropology

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5610

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4620 (3) Nationalism and Cultural Citizenship

Explores the nature of ethnic conflict, nationalism, and cultural citizenship in different contexts, including the United States. Is the nation-state dead? What effect do extranational and transnational organizations/institutions (e.g., European Union) have on the development of nationalism? Through the exploration of contemporary theory and case studies, this class will address these important contemporary concerns.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4630 (3) Nomadic Peoples of East Africa

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5630

Recommended: Prerequisite students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

ANTH 4690 (3-6) Anthropology of Tibet

Explores the culture of Tibet in both historical and thematic manners, considering the long-term development of Tibetan cultural practices and institutions as well as many of the abrupt changes introduced to Tibet in the 20th century. Topics covered include region, politics, gender, warfare, poetry and literature, and life under Chinese rule and as refugees around the world.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4710 (3) Departmental Honors in Anthropology 1

Course work built around theme of research design as a means of integrating previous training in the field of anthropology as well as providing an opportunity to perform creative scientific investigations. Prepares students to write an honors thesis in ANTH 4720. Required of students doing Anthropology departmental honors.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sciences Honors Course

ANTH 4720 (3) Departmental Honors in Anthropology 2

Continuation of ANTH 4710.

Recommended: Prerequisite ANTH 4710.

Additional Information: Arts Sciences Honors Course

ANTH 4730 (3) Latin American Politics and Culture through Film and Text

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5730

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4735 (3) Contemporary Cuban Culture: Race, Gender and Power

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5735

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Letter Grade

ANTH 4740 (3) Peoples and Cultures of Brazil

Thematically surveys theoretical and ethnographic issues that have been important in understanding Brazil. Read and write critically about textual and visual representations of Brazil presented in the course.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ANTH 2100 and three or more cultural anthropology courses.

ANTH 4745 (3) Science, Technology and Society

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5745

Grading Basis: Letter Grade

ANTH 4750 (3) Culture and Society in South Asia

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5750

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4755 (3) Cultures of Expertise: Science, Power and Knowledge

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5755

Grading Basis: Letter Grade

ANTH 4760 (3) Ethnography of Southeast Asia and Indonesia

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5760

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4770 (3) Anthropology of Tourism

Introduces students to anthropological theories on tourism and considers those theories in the contexts of the varied sites and forms of tourism practiced around the world today. We will ask: why do people tour? Where do they go? And most centrally: how do the hosts to tourism feel about these outside visitors? Having been exposed to questions of globalization, development, belonging, race, gender, and desire, students will then be asked to reflect upon and theorize their own touristic experiences.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4800 (3) Language and Culture

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

Equivalent - Duplicate Degree Credit Not Granted: LING 4800

Recommended: Prerequisites ANTH 2100 or LING 1000 or LING 2400 and students with 57-180 credits (Junior or Senior) only.

ANTH 4840 (1-8) Independent Study

For upper-division undergraduate students.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

ANTH 4910 (1-3) Teaching Anthropology

Practicum by special arrangement only. Students learn to teach anthropology by serving as recitation leaders or tutors in introductory courses or as small group leaders in advanced courses.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

ANTH 4930 (1-6) Anthropology Internship

Provides academically supervised opportunities for junior and senior anthropology majors to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5930

Repeatable: Repeatable for up to 9.00 total credit hours.

Recommended: Prerequisites ANTH 2010 and ANTH 2100 and ANTH 2200 and students with 57-180 credits (Junior or Senior) Anthropology majors, with a minimum 3.25 GPA.

Anthropology - Bachelor of Arts (BA)

Anthropology is the study of people, both ancient and modern, in their cultural context. The field involves a global look at human cultures from prehistoric times to the present, integrating findings from the social sciences, natural sciences and humanities. Students of anthropology learn to appreciate the variety of cultures throughout human history and to understand the meaning of human biological and cultural development as well as diversity.

The undergraduate degree in anthropology emphasizes knowledge and awareness of:

- basic methods, concepts, alternative theories and approaches and modes of explanation appropriate to each of the three main subfields of the discipline (archaeology, biological anthropology and cultural anthropology);
- basic archaeological techniques, including stratigraphy, dating and inference of human behavior from archaeological data, as well as human history from its beginning through the emergence of complex societies;
- variation, patterning and creativity in human communities and symbolic systems, including ecological, social structural and cultural factors exemplified in a diverse array of the world's societies, including those undergoing change as a result of globalization and the impact of contemporary social and political movements; and
- theories of primate and human evolution and the basic data of the hominid fossil record, as well as biological variation in contemporary human populations.

In addition, students completing the degree in anthropology are expected to acquire the ability and skills to:

- identify trends or patterns in anthropological data from different cultures or periods, identify an appropriate context of explanation or interpretation and formulate a testable explanation or reasonable

interpretation, including the ability to identify data that constitute credible evidence for an explanation or interpretation; and

- identify and define a significant problem or topic in anthropology and analyze and interpret data in a systematic manner.

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in Anthropology, in addition to completing all the current requirements for the BA with a major in Anthropology at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. (A minimum of 30 credit hours in anthropology, 18 of which must be upper division, is required for the degree.)

Required Courses and Semester Credit Hours

Required Courses

ANTH 2010	Introduction to Biological Anthropology 1	3
ANTH 2100	Introduction to Cultural Anthropology	3
ANTH 2200	The Archaeology of Human History	3
	One upper-division topical course in cultural anthropology	3
	One upper-division ethnographic area course in cultural anthropology	3
	One upper-division course in archaeology	3
	One upper-division course in physical anthropology	3

Electives

	Electives in anthropology (6 credit hours must be at the upper-division level; students planning to pursue graduate work in anthropology are advised to take ANTH 4000 and ANTH 4530)	9
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Total Credit Hours		30
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In addition, students planning to pursue writing a senior honor's thesis or graduate work in Anthropology are advised to take ANTH 4000 and an upper-division Anthropology theory course.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in anthropology, students should meet the following requirement:

- By the beginning of the second semester, declare the anthropology major.

Anthropology - Minor

Anthropology is the study of people, both ancient and modern, in their cultural, biological and environmental contexts. Anthropology is the only field to address all aspects of the human experience—cultural, biological, historical—so the discipline necessarily incorporates a wide range of theoretical and methodological traditions, drawing on and contributing to approaches in the humanities, social sciences and natural sciences. It is the breadth of our vision of what it means to be human, as well as the breadth of our theoretical and methodological approaches, that

constitutes our unique mission and role within the university. Thus, a minor in anthropology would provide a rich intellectual complement to a wide range of majors within the College of Arts and Sciences.

Requirements

A minimum of 18 credits hours of anthropology courses, including a minimum of 9 upper-division credit hours, are required for the minor. All course work applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all anthropology course work must equal 2.00 (C) or higher.

Students will be allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work towards a minor in anthropology.

Course work applied towards a minor in anthropology may also be applied towards general education (core/college list) and major requirements.

Required Courses and Semester Hours

Required Courses

ANTH 2010	Introduction to Biological Anthropology 1	3
ANTH 2100	Introduction to Cultural Anthropology	3
ANTH 2200	The Archaeology of Human History	3

Electives

Nine hours of upper-division electives in anthropology	9
Total Credit Hours	18

The three introductory courses will provide all minors with an appreciation of the range of scholarship encompassed by contemporary anthropology.

Students are recommended to select upper-division course work to best complete their majors. For example, the following subjects work well with the majors listed:

- cultural anthropology: Asian studies, communications, economics, ethnic studies, film studies, international affairs, Jewish studies, linguistics, media studies, political science, religious studies, sociology or women and gender studies majors
- archaeology: art history, classics or environmental design majors
- physical anthropology: ecology and evolutionary biology, integrated physiology or molecular, cellular and developmental biology majors
- archaeology or physical anthropology: history or humanities majors
- any of the anthropology subdisciplines: environmental studies or geography majors

Applied Mathematics

The Department of Applied Mathematics in the College of Arts and Sciences offers courses that focus on providing students with the mathematical tools and problem-solving strategies that are useful in science and engineering. The department offers a range of courses and research opportunities in many areas, including computational mathematics, mathematical biology, nonlinear phenomena, physical applied mathematics and probability and statistics. Each of these areas is described below.

The undergraduate Bachelor of Science degree (p. 632) is offered through the College of Engineering and Applied Science.

Course code for this program is APPM.

Computational Mathematics

The study of computational mathematics has grown rapidly in recent years and has allowed scientists and engineers to answer questions and to develop insights not possible just a decade or two ago. Modern computational methods require in-depth knowledge of a variety of mathematical subjects including linear algebra, analysis, ordinary and partial differential equations, asymptotic analysis, elements of harmonic analysis and nonlinear equations. Since computers are invaluable tools for an applied mathematician, students are expected to attain a high level of computer literacy and to gain a substantial knowledge of operating systems and hardware. Computational mathematics courses include the study of computational linear algebra, optimization, numerical solution of ordinary and partial differential equations, solution of nonlinear equations and advanced seminars in wavelet and multiresolution analysis and in multigrid methods, radial basis functions and algorithm design and development, more generally.

Mathematical Biosciences

Advances in our ability to quantitatively study biological phenomena have provided a number of exciting opportunities for applied mathematicians. The careful modeling, analysis and simulation of these systems using the standard and state-of-the-art tools of applied mathematics has led to novel and non-intuitive insights into biology. Furthermore, deeper understanding of the inherently complex and multiscale nature of biological systems, in many cases, requires the development of new mathematical tools, techniques and methodologies (a challenge to which applied mathematics is particularly well suited). For students interested in pursuing research in mathematical biology, good preparatory classes would include differential equations, advanced calculus, numerical analysis and probability and statistics, as well as supplemental courses in the appropriate biological, biomedical or bioengineering fields. Research areas at CU encompass immunology, virology, bacteriology, population genetics and cardiac nonlinear dynamics. Specifically, current topics of interest include model selection and control of in vivo HIV pathogenesis dynamics, modeling of intracellular calcium dynamics, the analysis of heart rhythm instabilities, the role of aggregation and fragmentation in bacteremia and bacterial pneumonia, inverse problems arising in the use of population genetics and bioinformatics to identify geographic features and the analysis of patterns in biological sequences such as DNA and RNA.

Dynamical Systems and Nonlinear Phenomena

In recent years, there has been an explosion of interest in the study of nonlinear waves and dynamical systems with analytical results, often motivated by the use of computers. The faculty in the Department of Applied Mathematics are actively and intensively involved in this growing field. Research areas include qualitative analysis and computational dynamics, conservative and dissipative systems, bifurcation theory, the onset and development of chaos, wavelets and multiresolution analysis, integrable systems, solitons, cellular automata, analytic dynamics, pattern formation and symmetry, synchronization, dynamics on networks, fluid dynamics, transport and mixing and the study of nonlinear phenomena arising from the interactions of many interconnected dynamical units. Department courses in this field include dynamical systems, nonlinear wave motion and many advanced seminars. Suitable background courses are analysis, computation and methods in applied

mathematics. Valuable supplemental courses include mechanics and fluid dynamics.

Physical Applied Mathematics

Physical applied mathematics is a term that generally refers to the study of mathematical problems with direct physical application. This area of research is intrinsically interdisciplinary. In addition to mathematical analysis, it requires an in-depth understanding of the underlying applications area, and usually requires knowledge and experience in numerical computation. The department has approximately 40 affiliated faculty who can direct thesis research in areas such as atmospheric and fluid dynamics, theoretical physics, plasma physics, genetic structure, parallel computation, etc. The department's course requirements are designed to provide students with a foundation for their study (analysis and computation). The department also requires supplemental courses in one of the sciences or engineering fields necessary for thesis research in physical applied mathematics.

Statistics and Applied Probability

Almost all natural phenomena in the technological, biological, physical and social sciences have random components with complex levels of interactions, part stochastic, part deterministic. Applied probability is the application of probabilistic and analytic methods to model, understand and predict the behavior of real-life problems that involve random elements. Statistics is the science of using data that typically arise from the randomness inherent in nature to gain new knowledge. Areas of current interest by applied math and their affiliated faculty include optimization of stochastic networks; the study of stochastic processes, and stochastic differential equations in hydrology and telecommunications; probabilistic models, nonparametric regression methods, shrinkage estimation, gene expression microarray data analysis, false discovery rate control, classification methods and statistical tests based on these models, in genetics and RNA sequencing; and extreme value theory in estimation of maximal wind speeds. Appropriate course work includes analysis, stochastic processes, simulation techniques and mathematical statistics, as well as background courses in one of the sciences or engineering fields in which one intends to do research.

For details on the range of courses and research opportunities available through the Department of Applied Mathematics, visit www.colorado.edu/amath.

The undergraduate Bachelor of Science degree (p. 637) is offered through the College of Engineering and Applied Science.

Minors

- Applied Mathematics - Minor (p. 158)
- Statistics - Minor (p. 159)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ablowitz, Mark J (https://experts.colorado.edu/display/fisid_100691)
Professor; PhD, Massachusetts Institute of Technology

Bebernes, Jerrold
Professor Emeritus

Becker, Stephen R (https://experts.colorado.edu/display/fisid_154263)
Assistant Professor; PhD, California Institute of Technology

Beylkin, Gregory (https://experts.colorado.edu/display/fisid_100437)
Professor; PhD, New York University

Bhat, Yermal Sujeet (https://experts.colorado.edu/display/fisid_146506)
Instructor; PhD, University of Florida

Bortz, David Matthew (https://experts.colorado.edu/display/fisid_143348)
Associate Professor; PhD, North Carolina State University at Raleigh

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Corcoran, Jem (https://experts.colorado.edu/display/fisid_118142)
Associate Professor; PhD, Colorado State University

Cox, Murray William (https://experts.colorado.edu/display/fisid_153192)
Instructor; PhD, Texas AM University

Curry, James H (https://experts.colorado.edu/display/fisid_105730)
Professor; PhD, University of California-Berkeley

Dougherty, Anne Margaret (https://experts.colorado.edu/display/fisid_101349)
Senior Instructor; PhD, University of Wisconsin-Madison

Dukic, Vanja (https://experts.colorado.edu/display/fisid_148718)
Professor; PhD, Brown University

Easton, Robert
Professor Emeritus

Fornberg, Bengt (https://experts.colorado.edu/display/fisid_108048)
Professor; PhD, Univ of Uppsala (Sweden)

Grooms, Ian G (https://experts.colorado.edu/display/fisid_155588)
Assistant Professor; PhD, University of Colorado Boulder

Hoefer, Mark (https://experts.colorado.edu/display/fisid_154264)
Associate Professor; PhD, University of Colorado Boulder

Julien, Keith (https://experts.colorado.edu/display/fisid_108913)
Professor; PhD, University of Cambridge (England)

Kilpatrick, Zachary Peter (https://experts.colorado.edu/display/fisid_155782)
Assistant Professor; PhD, University of Utah

Kleiber, William Paul (https://experts.colorado.edu/display/fisid_151943)
Assistant Professor; PhD, University of Washington

Li, Congming (https://experts.colorado.edu/display/fisid_100647)
Professor; PhD, New York University

Lladser, Manuel Bosco (https://experts.colorado.edu/display/fisid_134170)
Associate Professor; PhD, Ohio State University

Manteuffel, Thomas A (https://experts.colorado.edu/display/fisid_102137)
Professor; PhD, University of Illinois at Urbana-Champaign

Martinsson, Per-Gunnar J (https://experts.colorado.edu/display/fisid_141180)

Professor; PhD, University of Texas at Austin

McCormick, Steven

Professor Emeritus

Meiss, James D (https://experts.colorado.edu/display/fisid_103702)

Professor; PhD, University of California-Berkeley

Meyer, Francois Georges (https://experts.colorado.edu/display/fisid_115559)

Professor; PhD, INRIA (France)

Norris, Jan Adam (https://experts.colorado.edu/display/fisid_101412)

Senior Instructor; PhD, University of Colorado Boulder

Restrepo, Juan G (https://experts.colorado.edu/display/fisid_145811)

Associate Professor; PhD, University of Maryland College Park Campus

Segur, Harvey (https://experts.colorado.edu/display/fisid_102287)

Professor; PhD, University of California-Berkeley

Zaharatos, Brian R (https://experts.colorado.edu/display/fisid_156225)

Instructor; MS, Colorado School of Mines

APPM 1235 (4) Pre-Calculus for Engineers

Prepares students for the challenging content and pace of the calculus sequence required for all engineering majors. Covers algebra, trigonometry and selected topics in analytical geometry. Prepares students for the calculus courses offered for engineering students. Requires students to engage in rigorous work sessions as they review topics that they must be comfortable with to pursue engineering course work. Structured to accustom students to the pace and culture of learning encountered in engineering math courses. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor. Formerly GEEN 1235.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1021 or MATH 1150

Requisites: Restricted to College of Engineering or Pre-Engineering Arts and Sciences majors only. Requires or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

APPM 1340 (4) Calculus 1 with Algebra, Part A

Studies selected topics in analytical geometry and calculus: rates of change of functions, limits, derivatives and their applications. This course and APPM 1345 together are equivalent to APPM 1350. The sequence of this course and APPM 1345 is specifically designed for students whose manipulative skills in the techniques of high school algebra and precalculus may be inadequate for APPM 1350. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

APPM 1345 (4) Calculus 1 with Algebra, Part B

Continuation of APPM 1340. Studies selected topics in calculus: derivatives and their applications, integration, differentiation and integration of transcendental functions. Algebraic and trigonometric topics are studied throughout, as needed.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330
Requisites: Requires prerequisite course of APPM 1340 (minimum grade C-).

APPM 1350 (4) Calculus 1 for Engineers

Topics in analytical geometry and calculus including limits, rates of change of functions, derivatives and integrals of algebraic and transcendental functions, applications of differentiations and integration. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330
Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr: Quant Reasn Mathmat Skills

APPM 1360 (4) Calculus 2 for Engineers

Continuation of APPM 1350. Focuses on applications of the definite integral, methods of integration, improper integrals, Taylor's theorem, and infinite series.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2300
Requisites: Requires prerequisite course of APPM 1345 or APPM 1350 or MATH 1300 (minimum grade C-).

APPM 2350 (4) Calculus 3 for Engineers

Covers multivariable calculus, vector analysis, and theorems of Gauss, Green, and Stokes.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2400
Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 2360 (4) Introduction to Differential Equations with Linear Algebra

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, and systems of linear differential equations.

Equivalent - Duplicate Degree Credit Not Granted: both MATH 2130 and MATH 3430
Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 2450 (1) Calculus 3 Computer Lab

Selected topics in analytic geometry and calculus with a focus on symbolic computation using Mathematica.

Requisites: Requires a corequisite course of APPM 2350.
Grading Basis: Pass/Fail

APPM 2460 (1) Differential Equations Computer Lab

Selected topics in differential equations and linear algebra with a focus on symbolic computation using MATLAB.

Requisites: Requires enrollment in a corequisite course of APPM 2360.
Grading Basis: Pass/Fail

APPM 2720 (1-3) Open Topics in Lower Division Applied Mathematics

Provides a vehicle for the development and presentation of new topics that are accessible to lower division Applied Mathematics students. These topics have the potential to be incorporated into the core APPM curriculum.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

Grading Basis: Letter Grade

APPM 2750 (4) Java: Training, Mathematical Algorithms, and Mobile Apps

Preparatory course for Java programming. Provides necessary background for Java language: basic object-oriented concepts, analysis, and design. Learn to create Java applets, applications and mobile apps, create graphic context, and identify the key features of Java foundation classes as well as other Java-related technology. Material is taught in the context of mathematical algorithms from calculus. Department enforced requisite, knowledge of a programming language.

Requisites: Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

APPM 3010 (3) Chaos in Dynamical Systems

Introduces undergraduate students to chaotic dynamical systems. Topics include smooth and discrete dynamical systems, bifurcation theory, chaotic attractors, fractals, Lyapunov exponents, synchronization and networks of dynamical systems. Applications to engineering, biology and physics will be discussed.

Requisites: Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

APPM 3050 (3) Scientific Computing in Matlab

Topics covered include: approximations in computing, computer arithmetic, interpolation, matrix computations, nonlinear equations, optimization, and initial-value problems with emphasis on the computational cost, efficiency, and accuracy of algorithms. The problem sets are application-oriented with examples taken from orbital mechanics, physics, genetics, and fluid dynamics.

Requisites: Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

APPM 3170 (3) Discrete Applied Mathematics

Introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering. Mathematical definitions and proofs are emphasized. Topics include formal logic notation, proof methods; set theory, relations; induction, well-ordering; algorithms, growth of functions and complexity; integer congruencies; basic and advanced counting techniques, recurrences and elementary graph theory. Other selected topics may also be covered.

Requisites: Requires a prerequisite or corequisite course of APPM 2350 or APPM 2360 or MATH 2400 (prereq minimum grade C-).

APPM 3310 (3) Matrix Methods and Applications

Introduces linear algebra and matrices with an emphasis on applications, including methods to solve systems of linear algebraic and linear ordinary differential equations. Discusses vector space concepts, decomposition theorems, and eigenvalue problems.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2130 and MATH 2135

Requisites: Requires prerequisite course of APPM 2350 or APPM 2360 or MATH 2400 (minimum grade C-).

APPM 3350 (3) Advanced Engineering Calculus

Extends the treatment of engineering mathematics beyond the topics covered in Calculus 3 and differential equations. Topics include non-dimensionalization, elementary asymptotics and perturbation theory, Reynold's transport theorem and extensions of Leibnitz's rule, as applied to continuum conservation equations, Hamiltonian formulations, Legendre and Laplace transforms, special functions and their orthogonality properties.

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

APPM 3570 (3) Applied Probability

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3810 or MATH 4510

Requisites: Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

APPM 4120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5120 and MATH 4120 and MATH 5120

Requisites: Requires a prerequisite course of APPM 3310 or MATH 2130 or MATH 2135 (minimum grade C-).

APPM 4350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems

Reviews ordinary differential equations, including solutions by Fourier series. Physical derivation of the classical linear partial differential equations (heat, wave, and Laplace equations). Solution of these equations via separation of variables, with Fourier series, Fourier integrals, and more general eigenfunction expansions.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5350

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4360 (3) Methods in Applied Mathematics: Complex Variables and Applications

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5360

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4380 (3) Modeling in Applied Mathematics

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5380

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

Recommended: Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

APPM 4390 (3) Modeling in Mathematical Biology

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5390

Requisites: Requires prerequisite courses of APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 (all minimum grade C-).

APPM 4440 (3) Undergraduate Applied Analysis 1

Provides a rigorous treatment of topics covered in Calculus 1 and 2. Topics include convergent sequences; continuous functions; differentiable functions; Darboux sums, Riemann sums, and integration; Taylor and power series and sequences of functions.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4450 (3) Undergraduate Applied Analysis 2

Continuation of APPM 4440. Study of multidimensional analysis including n-dimensional Euclidean space, continuity and uniform continuity of functions of several variables, differentiation, linear and nonlinear approximation, inverse function and implicit function theorems, and a short introduction to metric spaces.

Requisites: Requires prerequisite course of APPM 4440 or MATH 3001 (minimum grade C-).

APPM 4500 (3) Statistical Collaboration

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5500

Requisites: Requires a prerequisite course of APPM 4520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4505 (2) Advanced Statistical Collaboration

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5505

Requisites: Requires prerequisite course of APPM 4500 or APPM 5500 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4510 (3) Data Assimilation in High Dimensional Dynamical Systems

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5510

Requisites: Requires prerequisite courses of APPM 3310 and APPM 3570 (all minimum grade C-).

Grading Basis: Letter Grade

APPM 4520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5520 and MATH 4520 and MATH 5520

Requisites: Requires prerequisite course of APPM 3570 or MATH 4510 (minimum grade C-).

APPM 4530 (3) Stochastic Analysis for Finance

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5530

Requisites: Requires prerequisite courses of APPM 3570 and APPM 3310 (all minimum grade C-). Requires prerequisite or corequisite course of APPM 4350 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5540 and MATH 4540 and MATH 5540

Requisites: Requires prerequisite course of APPM 4520 or MATH 4520 (minimum grade C-).

APPM 4550 (3) Spatial Statistics

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5550

Requisites: Requires prerequisite course of APPM 4520 or APPM 5520 or MATH 4520 or MATH 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4560 (3) Markov Processes, Queues, and Monte Carlo Simulations

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5560

Requisites: Requires prerequisite course of APPM 3570 or MATH 4510 (minimum grade C-).

APPM 4570 (3) Statistical Methods

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5570

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 4580 (3) Introduction to Statistical Learning

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5580

Requisites: Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-).

APPM 4590 (3) Statistical Modeling

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5590

Requisites: Requires prerequisite course of APPM 4520 or APPM 4570 or MATH 4520 (minimum grade C-).

APPM 4650 (3) Intermediate Numerical Analysis 1

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced prerequisite: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4650

Requisites: Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

APPM 4660 (3) Intermediate Numerical Analysis 2

Continuation of APPM 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations. Department enforced prerequisite: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4660

Requisites: Requires prerequisite course of APPM 4650 or MATH 4650 (minimum grade C-).

APPM 4720 (1-3) Open Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5720

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APPM 4840 (1-3) Reading and Research in Applied Mathematics

Introduces undergraduate students to the research foci of the Department of Applied Mathematics. Department enforced prerequisite: variable depending on the topic.

Repeatable: Repeatable for up to 9.00 total credit hours.

APPM 4950 (1-3) Seminar in Applied Mathematics

Introduces undergraduate students to the research foci of the program in applied mathematics. It is also designed to be a capstone experience for the program's majors. Department enforced prerequisite: variable depending on the topic.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Applied Mathematics - Minor

A minor is offered in applied mathematics. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

The minor in applied mathematics was developed to provide in-depth training in mathematical techniques and computational methods well beyond the training usually received by science and engineering majors. The minor currently offers three tracks: general emphasis, scientific computing and mathematical software, or probability and statistics. The goals of each track are to introduce students to more advanced mathematical techniques and problem-solving strategies. Such skills are becoming increasingly important for students who expect to participate in areas requiring analysis or modeling of real world situations.

The department also offers a minor in statistics (p. 159) which was developed to provide in-depth training in statistical methods and techniques well beyond the training usually received by science and engineering majors. The ability to understand, visualize and analyze data is becoming an increasingly important skill in many disparate fields. This minor offers undergraduate students from any major the opportunity to develop their statistical knowledge.

Requirements

Prerequisites

Prerequisites for the applied math minor are two semesters of calculus and computing experience, as provided by CSCI 1300, CSCI 1310, or CHEN 1310.

Residency

A minimum of 20 credits at the 2000-level and above is required. At least three applied mathematics courses, two of which must be at the 3000-level or above, need to be taken on the Boulder campus. No more than nine credit hours may be applied from transfer work; of those nine, no more than six may be 3000-level or above.

Minimum Grades

A cumulative GPA of 2.00 or better is required in the courses that are used to satisfy the requirements for this minor. Each individual course that is counted towards these degree requirements must be passed with a grade of C- or better.

Required Courses and Semester Credit Hours

Course Requirements	20
APPM 2350 Calculus 3 for Engineers	4
or MATH 2400 Calculus 3	
APPM 2360 Introduction to Differential Equations with Linear Algebra	4
APPM 3310 Matrix Methods and Applications	3

Choose one area of emphasis:

General Emphasis:

Choose two of the following three courses:

APPM 4650	Intermediate Numerical Analysis 1	
APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	
APPM 4360	Methods in Applied Mathematics: Complex Variables and Applications	

One 3-credit upper division applied math course at the 3000 or 4000 level

Scientific Computation Emphasis:

APPM 3050	Scientific Computing in Matlab ¹	3
APPM 4650 & APPM 4660	Intermediate Numerical Analysis 1 and Intermediate Numerical Analysis 2	6

Probability and Statistics Emphasis: ²

APPM 3570	Applied Probability	3
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One of the following sequences:

APPM 4570 & APPM 4580	Statistical Methods and Introduction to Statistical Learning	
APPM 4560 & APPM 4520	Markov Processes, Queues, and Monte Carlo Simulations and Introduction to Mathematical Statistics	

¹ APPM 3050 is not appropriate for junior or senior aerospace engineering sciences majors. These students should substitute another upper divisions applied math course.

² A student cannot earn a minor in statistics (p. 159) and a minor in applied mathematics with probability and statistics emphasis.

Statistics - Minor

A Department of Applied Mathematics offers a minor in statistics. Declaration of a minor is open to any student enrolled at CU-Boulder, regardless of college or school. For more information, see minor requirements. (p. 127)

The minor in statistics was developed to provide in-depth training in statistical methods and techniques well beyond the training usually received by science and engineering majors. The ability to understand, visualize, and analyze data is becoming an increasingly important skill in many disparate fields. This minor offers undergraduate students from any major the opportunity to develop their statistical knowledge.

Prerequisites for the Statistics minor are two semesters of calculus and computing experiences such as provided by CSCI 1300, CSCI 1310, or CHEN 1310.

Residency

A *minimum* of 19 credits at the 2000-level and above is required. At least three applied mathematics courses, two of which must be at the 3000-level or above, need to be taken on the Boulder campus. No more than nine credit hours may be applied from transfer work; of those nine, no more than six may be 3000-level or above.

Minimum Grades

A cumulative GPA of 2.00 or better is required in the courses that are used to satisfy the requirements for this minor. Each individual course that is counted towards these degree requirements must be passed with a grade of C- or better.

Course Requirements	19
APPM 2350 Calculus 3 for Engineers or MATH 2400 Calculus 3	4

APPM 3310	Matrix Methods and Applications	3
APPM 3570	Applied Probability	3
APPM 4520	Introduction to Mathematical Statistics	3
APPM 4590	Statistical Modeling	3

And *ONE* of the following courses:

APPM 4560	Markov Processes, Queues, and Monte Carlo Simulations	3
APPM 4540	Introduction to Time Series	3
APPM 4580	Introduction to Statistical Learning ¹	3

Any one of APPM's 3-credit special topic courses on Probability or Statistics may also be used to meet this requirement ²

¹ APPM 4580 has a prerequisite of APPM 4570, or APPM 3570 **AND** APPM 4520

² A student cannot earn a minor in Statistics and a minor in Applied Mathematics (p. 158) with the probability and statistics emphasis.

Art and Art History

The Department of Art and Art History offers the bachelor of arts in art history and in art practices and the bachelor of fine arts in art practices.

The undergraduate degree in art history emphasizes knowledge and awareness of:

- the major artistic movements of the world in a historical context;
- varied methodologies used to study art historically; and
- artistic media and techniques.

In addition, students completing the degree in art history are expected to acquire the ability and skills to:

- relate individual movements to their historical and cultural context by identifying technique, style and subject matter;
- interpret historical and critical information about works of art, artists and related issues; and
- organize and communicate concepts and data pertaining to the history of art effectively in written and oral form.

The undergraduate degree in art practices emphasizes knowledge and awareness of:

- the significance of the major movements in art history, with an emphasis on contemporary art;
- at least one discipline of studio art;
- related critical issues in studio practice; and
- a wide range of stylistic approaches.

In addition, students completing a degree in art practices are expected to acquire the ability and skills to:

- analyze their own works of art in terms of form and content;
- interpret the work of others;
- execute ideas in one or more artistic media;
- demonstrate artistic ability and technical proficiency in one chosen medium; and
- communicate in verbal and written form the particular conceptual and perceptual attitudes and stances of their own artistic production.

Course codes for these programs are ARTS, ARTF and ARTH.

Honors

Students may graduate with departmental honors. Those interested in pursuing this program should contact the Honors Department and/or the Department of Art and Art History honors representative as early as possible. The minimum GPA requirement is 3.300 overall and 3.500 in the major. Students may take Art Practices or Art History Honors Thesis to complete individual work.

Program Fees

Each course in the department has a program fee calculated at \$75 per art history course and \$225 per art practices course.

Special Programs

The CU Art Museum

The CU Art Museum is a cultural gateway to the University of Colorado Boulder, facilitating engagement with larger societal issues through a greater understanding of the arts in a global context. The CU Art Museum is committed to enhancing understanding and appreciation of the visual arts within the academic community and among regional, national and international audiences. It provides access to art of the highest quality through exhibitions, publications and related educational events that reflect diversity, critical thinking and creative research. The museum also facilitates student training in museum practices. As a collecting institution, the CU Art Museum promotes the excellence, preservation, scholarly interpretation, exhibition and growth of its comprehensive permanent collection, which includes artworks from numerous time periods, artistic traditions and cultures. The new 25,000-square-foot CU Art Museum contains five galleries including permanent collection galleries, changing exhibition galleries and a video gallery. The CU Art Museum also includes a collections study center, allowing students, faculty and researchers the opportunity to schedule appointments to view, research and study works in its permanent collection.

The CU Art Museum's Permanent Collection

The Permanent Collection of the CU Art Museum contains over 6,000 works of art. The collection includes works from numerous time periods and cultures including ancient Greek pottery, Roman Glass, ancient Iranian pottery, Southwestern and South American santos, Southeast Asian pottery, African sculpture, Old Master works on paper, British 18th century prints, 19th and 20th century American prints and paintings, Japanese *ukiyo-e* prints, 19th century photography, Pop art, Minimalist works on paper and modern and contemporary ceramics, sculpture, works on paper, paintings, photography, video and new media art.

Visiting Scholar Program

This program is organized to explore the discipline of art history—its cultural connections, methodological pursuits and its changing nature—by focusing extensively on the research and insights of individual academic experts. Three to five highly regarded art historians and/or art critics speak at a public lecture, presenting current research and published papers. During their week-long visit they work closely with students enrolled in the Visiting Scholar Seminar.

Visiting Artist Program

Artists of national and international reputation interact with graduate and advanced undergraduate students and discuss their studio work at seminar meetings. Artists present a public lecture during their visit, providing continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

Visual Resources Center (VRC)

The mission of the VRC is to provide and facilitate access to images, imaging and related information resources for teaching and research in the Department of Art and Art History. This includes:

1. a departmental image collection and support for other important image resources;
2. resources, training and support in digital imaging and image presentation software; and
3. equipment for use in creative work, documentation and classrooms within the department.

The digital image collection contains works by faculty, MFA thesis recipients, visiting artists and other contemporary and historical works. Digital imaging resources include slide and flatbed scanning stations, with training available in digitization standards and best practices. VRC equipment includes laptops, data projectors, digital SLR cameras, video cameras, tripods and other equipment for use in the department. The VRC also circulates its collection of DVDs containing lectures and interviews from the department's Visiting Artist Program. More information is available at cuart.colorado.edu/resources/vrc (<http://cuart.colorado.edu/resources/vrc>).

Bachelor's Degrees

- Art Practices - Bachelor of Fine Arts (BFA) (p. 178)
- Art History - Bachelor of Arts (BA) (p. 176)
- Art Practices - Bachelor of Arts (BA) (p. 177)

Minor

- Art History - Minor (p. 177)

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alhadeff, Albert (https://experts.colorado.edu/display/fisid_100711)
Associate Professor; PhD, New York University

Ambrose, Kirk T (https://experts.colorado.edu/display/fisid_115914)
Professor; PhD, University of Michigan Ann Arbor

Amerika, Mark (https://experts.colorado.edu/display/fisid_116523)
Professor; MFA, Brown University

Beitz, Michael D (https://experts.colorado.edu/display/fisid_156062)
Assistant Professor; MFA, SUNY at Buffalo

Brown, Marilyn Ruth (https://experts.colorado.edu/display/fisid_143782)
Professor; PhD, Yale University

Chamberlin, H Scott (https://experts.colorado.edu/display/fisid_105456)
Professor; MFA, New York State Col of Ceramics at Alfred Univ

Charteris, Frances (https://experts.colorado.edu/display/fisid_100730)
Lecturer; MFA, University of California-San Diego

Chong, Albert (https://experts.colorado.edu/display/fisid_100586)
Professor; MFA, University of California-San Diego

Cline, Clinton C.
Professor Emeritus

Cordova, James M. (https://experts.colorado.edu/display/fisid_146415)
Associate Professor; PhD, Tulane University of Louisiana

Day, Robert E.
Professor Emeritus

de Stecher, Annette W (https://experts.colorado.edu/display/fisid_155095)
Assistant Professor; PhD, Carleton University (Canada)

Dickey, Kimberly (https://experts.colorado.edu/display/fisid_115735)
Professor; MFA, New York State Col of Ceramics at Alfred Univ

Duresse-Stimilli, Françoise (https://experts.colorado.edu/display/fisid_144418)
Associate Professor; MFA, Temple University

Eades, Luis E.
Professor Emeritus

Ecker, Robert R.
Professor Emeritus

Farago, Claire Joan (https://experts.colorado.edu/display/fisid_101552)
Professor; PhD, University of Virginia

Forsman, Charles S.
Professor Emeritus

Foster, Suzanne R.
Professor Emeritus

Frost, Steven Earl (https://experts.colorado.edu/display/fisid_156502)
Instructor

Geck, Francis J.
Professor Emeritus

Gregorio, Alvin P (https://experts.colorado.edu/display/fisid_143596)
Associate Professor; MFA, Claremont Graduate School

Haynes, Deborah J.
Professor Emeritus

Iwamasa, Ken
Professor Emeritus

Kunkel, Jerry W.
Professor Emeritus

Miller, Kay
Professor Emeritus

Minor, Vernon H.
Professor Emeritus

Nauman, Robert (https://experts.colorado.edu/display/fisid_106835)
Senior Instructor; PhD, University of New Mexico

Potter, Thomas J.
Professor Emeritus

Qualley, Charles A.
Professor Emeritus

Quinn, Jeanne (https://experts.colorado.edu/display/fisid_111658)
Associate Professor; MFA, University of Washington

Rivera, George F (https://experts.colorado.edu/display/fisid_103055)
Professor; PhD, SUNY at Buffalo

Roth, Yumi J (https://experts.colorado.edu/display/fisid_126287)
Associate Professor; MFA, SUNY College at New Paltz

Sampson, John Franklin
Professor Emeritus

Saxton, Richard W (https://experts.colorado.edu/display/fisid_144756)
Associate Professor; MFA, Indiana University Bloomington

Stevens, Charlene (https://experts.colorado.edu/display/fisid_143589)
Associate Professor; MFA, Indiana University Bloomington

Sweetman, Alex John (https://experts.colorado.edu/display/fisid_100531)
Associate Professor; MFA, SUNY at Buffalo

Theodore, Michael (https://experts.colorado.edu/display/fisid_113318)
Associate Professor; PhD, University of California-San Diego

Valdovino, Luis Hector (https://experts.colorado.edu/display/fisid_101863)
Professor; MFA, University of Illinois at Urbana-Champaign

van Lil, Kira (https://experts.colorado.edu/display/fisid_145210)
Assistant Professor; PhD, Ludwig-Maximilians Univ of Munich (Germany)

Vandersall, Amy L.
Professor Emeritus

Walker, Melanie (https://experts.colorado.edu/display/fisid_101750)
Associate Professor; MFA, Florida State University

Wilson, John B.
Professor Emeritus

Wolfe, Lynn Robert
Professor Emeritus

Womack, Mike Fitzgerald (https://experts.colorado.edu/display/fisid_148502)
Assistant Professor; MFA, Pratt Institute

Woodman, Elizabeth A.
Professor Emeritus

Woodman, George E.
Professor Emeritus

Yazzie, Melanie A. (https://experts.colorado.edu/display/fisid_143620)
Professor; MFA, University of Colorado Boulder

ARTH 1300 (3) History of World Art 1

Surveys major art styles from the Paleolithic period through the Renaissance, including European, Asian, and the Pre-Columbian/Islamic world. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 1400 (3) History of World Art 2

Surveys major art styles from about 1600 to the present, including Europe, Asia, the Islamic world, the Americas and Africa. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 1509 (4) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1509

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Arts Sci Core Curr: Historical Context
Departmental Category: Art History

ARTH 1709 (3) Freshmen Seminar: Critical Introduction to Art History

Provides a broad introduction to understanding and appreciating art and art history within a critical lecture seminar and discussion format. The focus of this course is a selected Particularity directed to nonmajors.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 2029 (3) Art and Archaeology of Ancient Egypt

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2029

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art History

ARTH 2039 (3) Greek Art and Archaeology

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture, and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2039

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 2049 (3) Introduction to Roman Art and Architecture

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2049

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 2409 (3) Intro to Asian Art

Designed for those having no previous experience in the study of Asian art. Traces development of sculpture, painting, architecture, and the other visual arts of South Asia, the Far East, and Southeast Asia, with a synopsis of developments from 1453 through the 18th century.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History
Departmental Category: Asia Content

ARTH 3009 (3) Critical Thinking in Art History

Through structured discussions, selected readings, and written assignments provides an understanding of how art history has evolved as an academic discipline and how art historians evaluate complex issues of style, form, content, and theory in the visual arts.

Additional Information: Departmental Category: Art History

ARTH 3019 (3) Pompeii and the Cities of Vesuvius

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 3019

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Art History

ARTH 3029 (3) Medieval and Early Modern Visual Culture, A.D. 400 to A.D. 1750

Introduces students to the literature, history, culture and art of Europe and the Mediterranean basin from late antiquity through the early modern period. Interdisciplinary approach to visual culture focuses on uses of sacred religious practices and lay devotion.

Additional Information: Departmental Category: Art History

ARTH 3079 (3) Medieval Art Survey

Surveys the history of Western art from Constantine to around the year 1300, including Carolingian, Ottonian, Anglo-Saxon, Romanesque, and Gothic. Considers "Barbarian," Byzantine, and Islamic influences.

Additional Information: Departmental Category: Art History

ARTH 3109 (3) Art in Contemporary Society

Examines writings by philosophers and art critics as they address the question: What is art for? Readings focus on the 19th and 20th centuries, including current theories and some non-Western theories. Students are encouraged to develop their own responses to the question.

Additional Information: Departmental Category: Art History

ARTH 3209 (3) Art, Culture, and Gender Diversity, 1400--1600: Renaissance Art Out of the Canon

Studies the rising status of painting, sculpture, and architecture in Europe and how Europeans perceived non-Western art during the early modern period. Introduces history of race/ethnicity, gender, and class concerns embodied in the European category visual arts. Emphasizes new methods for interpreting history without imposing Eurocentric viewpoints.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art History

ARTH 3210 (3) The Art of Renaissance Cities and Courts

Surveys the development and spread of humanist culture associated with the modern term "Renaissance Art" from c. 1400-1600, organized by location, artist, and patron. Presents significant works of paintings, sculpture and architecture at a number of major artistic centers including Florence, Rome, Venice, Fontainebleau, and Prague.

Additional Information: Departmental Category: Art History

ARTH 3241 (3) Art in Islam

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ARAB 3241

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 3329 (3) Art in France: Revolution to 1870

Covers major art movements and theories in France from 1793 to 1870 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

Recommended: Prerequisites ARTH 1300 and second semester sophomore, junior or senior standing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3339 (3) Art in France: 1870-1970

Covers major art movements and theories in France from the Paris Commune through 1970 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

Recommended: Prerequisite ARTH 1300 and second semester sophomore, junior or senior standing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3359 (3) Art in Spain: Goya to 1900

Explores the scope of Goya's works in context of his contemporaries and antecedent, Velazquez; Moorish influences, genre painting costumbrismo, Romanticism and historical narratives are considered in relation to Enlightenment ideals, French Neoclassicism, Romanticism, Orientalism and the Napoleonic invasion. Teaching occurs mostly on site: Alhambra, Prado, Bellas Artes, Palacio Real, Museo de Romanticismo; seminars and tests are in Madrid classrooms.

Recommended: Prerequisite ARTH 1300.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3369 (3) Art in Spain: 1900-1990

Covers Gaudi, Picasso and artists of Modernismo movement as well as Dali are studied in Barcelona; Dada and Surrealism are explored through works of Picasso, Gonzalez, Gris, Varo, Dali, Bunuel and others. Photography and film of Spanish Civil War and thereafter are studied in seminar in Madrid classroom; students experience flamenco performances and Q&A with performers. Tests administered in class.

Recommended: Prerequisite ARTH 1300.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3419 (3) Modern Art Survey

Surveys the loss of beauty in art and discusses whether or not that loss is regrettable. Questions the function and historical meaning of modern and postmodern art: is it all hype and strategic positioning by artists for fame and fortune? Is it serious? Are the fine arts still fine?

Additional Information: Departmental Category: Art History

ARTH 3509 (3) American Art

Surveys American art and material culture from the precolonial era to the present day. Considers cultural and artistic interaction, ethnic expressions, patronage, European and non-Western influences, and the struggle to develop a uniquely American artistic identity.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Art History

ARTH 3519 (3) Modern Architecture, 1780--1960

Introduces the major movements and developments in European and American architecture from Neoclassicism to Postmodernism. Considers the impact of exhibitions, expositions, and vernacular architecture.

Additional Information: Departmental Category: Art History

ARTH 3539 (3) Contemporary Art

Examines contemporary art and theory in the transition from modern to postmodern expression. Discusses painting, sculpture, installations, performance, video, photography, and architecture with attention to historical context and criticism. Considers neoexpressionist, feminist, minority, political, and public art.

Additional Information: Departmental Category: Art History

ARTH 3619 (3) The Arts of China

Surveys Chinese painting, sculpture, architecture, and other arts from neolithic to modern times.

Additional Information: Departmental Category: Art History
Departmental Category: Asia Content

ARTH 3629 (3) The Arts of Japan

Offers an appreciation and chronological development of the arts of Japan. Emphasizes the arts of Shintoism and Buddhism as well as the particular Japanese aesthetic from prehistoric times to the present.

Additional Information: Departmental Category: Art History
Departmental Category: Asia Content

ARTH 3719 (3) History of Media Arts

Surveys the development of technological media both as sources of information and as art. Photography and related media, film, video, holography, and electronic imaging systems are surveyed as art and as technologies, emphasizing major artists, movements, exhibitions, and other productions in the 19th and 20th centuries.

Additional Information: Departmental Category: Art History

ARTH 3729 (3) Foundations in Latin American Art

Examines Latin America's cultural pluralism and art production beginning in pre-Columbian times and following through to the present. Considers the various functions of art as well as the relationship between objects, artists, and the cultures from which they come. Provides students with a broad frame of reference for many historical periods and equips students to evaluate art objects and their cultural contexts.

Additional Information: Departmental Category: Art History

ARTH 3929 (1-3) Special Topics in Art History

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4029 (1) Art History Research Methods

Learn to expertly navigate art scholarship and be prepared to do thesis-level research. An introduction to the vast array of art historical resources and their uses. Explore advanced techniques for searching both online and offline sources of art information. Master the various modes of art historical research, including finding iconographic, historical, or technical information.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5029 and LIBR 4029

Additional Information: Departmental Category: Art History

ARTH 4069 (3) Medieval Manuscripts

Surveys decorated books from late antiquity to the advent of the printing press. Examines the various roles manuscripts played within different medieval communities.

Additional Information: Departmental Category: Art History

ARTH 4089 (3) Romanesque and Gothic Art

Examines major artistic trends in Europe between the years 1000 and 1300, a period that witnessed, among others, the development of gothic cathedrals and the rise of the professional artist. Particular attention will be given to exchange with other cultures.

Additional Information: Departmental Category: Art History

ARTH 4109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5109 and CLAS 4109 and CLAS 5109

Recommended: Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

Additional Information: Departmental Category: Art History

ARTH 4119 (3) Roman Sculpture

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5119 and CLAS 4119 and CLAS 5119

Recommended: Prerequisite ARTH 1300 or CLAS 2049.

Additional Information: Departmental Category: Art History

ARTH 4129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4129 and ANTH 5129 and CLAS 4129 and CLAS 5129

Additional Information: Departmental Category: Art History

ARTH 4139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5139 and CLAS 4139 and CLAS 5139

Additional Information: Departmental Category: Art History

ARTH 4149 (3) Greek Cities and Sanctuaries

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4149 and CLAS 5149

Additional Information: Departmental Category: Art History

ARTH 4169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5169 and CLAS 4169 and CLAS 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4189 (3) Medieval Art

Focuses on one area of medieval art. Topics vary, but may include Carolingian, Ottonian, Romanesque, or Gothic art. Emphasizes critical thinking, methods of scholarly research, and development of writing skills.

Additional Information: Departmental Category: Art History

ARTH 4199 (3) Roman Architecture

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4199 and CLAS 5199

Additional Information: Departmental Category: Art History

ARTH 4209 (6) Classical Archaeological Field Methods

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4209 and CLAS 5209

Recommended: Prerequisites CLAS 1509 or ARTH 1509 or ARTH 2039 and ARTH 2049.

Additional Information: Departmental Category: Art History

ARTH 4229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5229 and CLAS 4229 and CLAS 5229

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Art History

ARTH 4269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5269 and CLAS 4269 and CLAS 5269

Recommended: Prerequisite CLAS 1509 or ARTH 1509.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Art History

Departmental Category: Asia Content

ARTH 4279 (3) Michelangelo (1475-1564)

Focuses on Michelangelo's long career, marked by outstanding achievements in sculpture, painting, architecture and poetry. Emphasizes his projects and achievements in light of 16th century artistic theory, including relationships to his contemporaries in the arts and literature.

Additional Information: Departmental Category: Art History

ARTH 4309 (3) Neoclassicism and Romanticism: 1760-1840

Surveys painting and sculpture in England and France from the last quarter of the 18th century through the first half of the 19th century.

Additional Information: Departmental Category: Art History

ARTH 4319 (3) European Art from 1830 to 1886

Surveys the major movements in painting in France and England from the Revolution of 1830 to the impressionist crisis of 1886. Emphasizes and discusses painting and major expressions in sculpture and architecture.

Additional Information: Departmental Category: Art History

ARTH 4329 (3) Modern Art 1

Provides an in-depth study of the fin de siècle, stressing postimpressionism, art nouveau and symbolism. Concludes with fauvism in France and the expressionist movement in Germany.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Art History

ARTH 4339 (3) Modern Art 2

Begins with early Picasso and cubism, including analytic and synthetic cubism and emphasizing the various isms of the 20th century. Also studies Italian futurism, de Stijl and the Bauhaus, dada and surrealism.

Additional Information: Departmental Category: Art History

ARTH 4419 (3) The Arts of Colonial Mexico and Peru

Examines important works, artists, and themes that comprise the artistic production of colonial Latin America. Focuses on the intermingling, convergence, and at times the clash of European, Amerindian, and African cultures, which established the foundation of Latin America's pluralism.

Recommended: Prerequisite ARTH 3729.

Additional Information: Departmental Category: Art History

ARTH 4449 (3) Arts of India and Southeast Asia

Surveys Indian painting, sculpture and architecture from its earliest phases in the Indus Valley through the Mughal Empire. Encompasses Hindu, Buddhist and Islamic art of the subcontinent and Southeast Asia, as well as Himalayan cultures directly impacted by India's artistic legacies. Department enforced prerequisite: one 3000-level art history course (minimum grade D-).

Additional Information: Departmental Category: Art History

ARTH 4459 (3) Precolumbian Art of Mesoamerica

Introduces students to the art, architecture, and cultures of Mesoamerica, a region that encompasses modern-day Mexico, Guatemala, Belize, and parts of El Salvador, and Honduras. Focuses on major Pre-Columbian art objects and monuments to learn about the societies and cultures from which they came. Also considers the various roles that the visual arts and architecture played in these societies. Covers Olmec through Aztec civilizations.

Recommended: Prerequisite ARTH 3729.

Additional Information: Departmental Category: Art History

ARTH 4559 (3) Twentieth-Century Architecture

Examines the major movements and development in European and American architecture, 1900-1960's. Considers the major styles, as well as cultural interactions, race/ethnicity, gender and class concerns as they relate to both the practice and profession of architecture.

Additional Information: Departmental Category: Art History

ARTH 4569 (3) United States Architecture

Examines architecture as it developed in the area now defined as the continental United States from early cultures to the present. Considers the major styles and issues of cultural interaction, race/ethnicity, gender and class concerns as they relate to the practice, theory, and profession of architecture.

Additional Information: Departmental Category: Art History

ARTH 4599 (3) Contemporary Architecture

Examines the history and theory of contemporary architecture. In the field of architecture, theory and history differ in that the former describes and analyzes past work, while theory offers alternative solutions or new strategies for approaching the discipline. Both of these components are key to understanding contemporary architecture, and this course will work between the two modes of understanding.

Additional Information: Departmental Category: Art History

ARTH 4609 (3) Critical Issues in Photography

Examines the history and theory of photography and the relationship of photography to the other arts, as well as to literary, political, social and philosophical issues. Analyzes the critical issues that inform photography through the writings of critics, historians, and photographers using both thematic and chronological approaches.

Additional Information: Departmental Category: Art History

ARTH 4629 (3) Degas Seminar

Introduces current Degas studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles. Fulfills requirement for ARTH 4919, Capstone Seminar.

Additional Information: Departmental Category: Art History

ARTH 4639 (3) Manet Seminar

Introduces current Manet studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles. Fulfills requirement for ARTH 4919, Capstone Seminar.

Additional Information: Departmental Category: Art History

ARTH 4649 (3) Impressionism & Post-Impressionism

Fosters creative study of the background and foundation in modern art. Considers 19th-century European painting and, to a lesser degree, sculpture, in relation to social, cultural, and political history from 1863 to 1900. Focuses on France, but gives attention to other countries as well.

Additional Information: Departmental Category: Art History

ARTH 4669 (3) Romanticism & Realism

Fosters creative study of the background and foundation of modern art. Considers 19th-century European (and, to a lesser degree, American) painting and sculpture in relation to social, cultural, and political history from 1789 (the French Revolution) to 1863 (the Salon des refusés). Focuses on France, but gives attention to other countries as well.

Additional Information: Departmental Category: Art History

ARTH 4679 (3) Romanticism Seminar

Introduces current Romanticism studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles.

Additional Information: Departmental Category: Art History

ARTH 4689 (3) Post-Impressionism Seminar

Introduces current Post-Impressionism studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles.

Additional Information: Departmental Category: Art History

ARTH 4699 (3) The Idea of Art

Studies contemporary critiques of historical ideas about the twin institutions of the university and the museum and the role of art history in the cultural mission of both. Explores fundamental questions about the role of art in society through weekly discussions of readings, a class presentation, and final research. Fulfills ARTH 4919 capstone seminar required for art history majors.

Additional Information: Departmental Category: Art History

ARTH 4739 (3) The Intellectual Roots of Italian Renaissance Art

Studies critical issues raised in the literature on art, focusing on Renaissance interpretations of key historical themes such as imitation and decorum. Carefully examines the language used in primary sources (available in English).

Additional Information: Departmental Category: Art History

ARTH 4749 (3) Italian Renaissance Art: Studies in the Exchange between Theory and Practice

Addresses how artists developed new compositional procedures, graphic techniques and audiences, and how these procedures were theorized in an age when artists' intellectual and social status rose dramatically. Explores reception of new graphic technology. Studies specific commissions and primary texts in depth.

Additional Information: Departmental Category: Art History

ARTH 4769 (3) Gender Studies in Early Modern Visual Culture

Examines 15th and 16th century European ideas about women from a variety of feminist perspectives. Focuses on recent contributions to history of women as they intersect with the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4769

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art History

ARTH 4779 (3) Multicultural Perspectives on New Mexican Santos

Reflects upon the question: in what sense were the regional variants of European devotional images the effects of meaningful cultural interaction? Evidence considered includes oral traditions, pueblo pottery and painting, emphasizing interpretations that respect rights of communities to maintain privacy.

Additional Information: Departmental Category: Art History

ARTH 4909 (1-3) Independent Study---Art History

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Art History

ARTH 4919 (3) Capstone Seminar: Topics in Art History

Seminar course dealing with selected areas or problems within the history of art. Consult current online Schedule Planner for seminar topic.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Art History (AAAH) majors only.

Additional Information: Departmental Category: Art History

ARTH 4929 (1-3) Special Topics in Art History

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5929

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4939 (3-6) Art Museum Internship

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5939

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4959 (3) Art History Honors Thesis

May be elected during the final semester. Consists of a substantial, original written thesis. Requires faculty sponsorship. Does not guarantee a student will receive honors.

Additional Information: Arts Sciences Honors Course

Departmental Category: Art History

ARTS 1002 (3) Beginning Drawing 1

Formal visual elements are presented through a study of spatial relationship. Built around a series of related problems, each of which is designed to develop fluency in drawing, offer experience in handling media, foster self-confidence and promote an understanding of the visual elements and their role in the development of pictorial space.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1003 (3) Printmaking for Non-Majors

Emphasizes processes involved with both nonmultiple and multiple methods, including but not limited to metal plate etching (intaglio), lithography, collagraph, woodcut, linoleum cut, Xerox transfer, and monotype. Places equal emphases on developing drawing skills and understanding design principles.

Additional Information: Departmental Category: Printmaking

ARTS 1010 (3) Introduction to Studio Art

Presents creative activity conceptually, and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Fine arts majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

Requisites: Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Foundations

ARTS 1012 (3) Drawing for Non-Majors

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1020 (3) Introduction to Studio Art 2

Presents creative activity conceptually and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Art and art history majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

Requisites: Requires prerequisite course of ARTS 1010 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Foundations

ARTS 1030 (3) Principles of Color

Introduces the relative effects of color as used by the artist. Emphasizes the practice of color relations including basic characteristics, mixtures, illusions, optical mixture, color intervals, and color quantity. May not be repeated.

Additional Information: Departmental Category: Foundations

ARTS 1171 (3) Photography for Non-Majors

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable film camera.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 2171

Additional Information: Departmental Category: Photography

ARTS 1202 (3) Basic Painting

The aim of this course is to develop the basic skills, techniques and processes of painting with an understanding of basic colour principles. This integration of paint application and colour principle will develop awareness that painting and colour are used, not only as mediums for representation, but also as mediums for expressive purposes. Demonstrations, lectures, group and individual critiques will be given throughout the course.

Requisites: Requires prerequisite course of ARTS 1010 (minimum grade D-). Requires a corequisite course of ARTS 1020. Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1212 (3) Painting for Non-Majors

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1514 (3) Sculpture for Non-Majors

Offers an orientation involving three-dimensional form and application. Studies expressive and conceptual problems based on non-objective form relationships in various sculptural materials. May not be repeated.

Additional Information: Departmental Category: Sculpture

ARTS 1875 (3) Ceramics for Non-Majors

Encompasses broad and fundamental uses of clay. Basic instruction and demonstration of throwing, hand building, and primitive clay forming methods. Investigates utility, function, and ceramics in the broader context of contemporary art. Slide presentations explore historical and contemporary attitudes involving ceramics.

Additional Information: Departmental Category: Ceramics

ARTS 2004 (3) Participatory Objects (Sculpture and Post-Studio Practice)

Looks at the tendency in contemporary sculpture to create interactive objects and experiences for the viewer. Students in this course are required to create hands-on projects, participate in group critiques and develop presentations and research projects.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 2022 (3) Beginning Drawing

Emphasizes proportion and perspective through observation based drawing. Students are introduced to various drawing materials and learn to translate what they see into drawing media using two basic subjects: still-life and the figure.

Requisites: Requires prerequisite course of ARTS 1010 and prerequisite or corequisite course of ARTS 1020 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 2085 (3) Ceramics 2: Handbuilding

Introduces techniques of hand-built clay forms as they relate to function and nonfunction. Various clay techniques, glazing and firing procedures are explored. Emphasizes ceramics in the broader context of contemporary art. May not be repeated.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 2095 (3) Ceramics 2: Wheelthrowing

Introduces techniques of wheel-thrown forms as they relate to function and nonfunction. Explores various glazing and firing methods. May not be repeated.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 2104 (3) Colossal Objects (Sculpture and Post-Studio Practice)

Focuses on the conception, design and production of art works that are larger than human scale. Each object will be the result of individual and team design collaboration. Primarily focuses on sculpture constructed and engineered from metal although other materials are welcome.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 2126 (3) Digital Art 1

An introductory course in the use of the personal computer to create and process images in the visual arts.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 2171 (3) Photography 1

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable camera.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 1171

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 2191 (3) Photography 2

Explores more sophisticated technical and conceptual skills to the creative process.

Requisites: Requires prerequisite course of ARTS 2171 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 2222 (3) Beginning Painting

Emphasizes color and descriptive mark making through observation based painting. Students are introduced to various painting materials and learn to translate what they see into painting media using two basic subjects: still-life and the figure.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 2244 (3) Drawing for Sculpture (Sculpture and Post-Studio Practice)

Explores and examines many relationships between sculpture and drawing. Projects will explore 2-D drawing and mixed media projects through the lens of sculptural practice. Scale, materials and styles will be researched along with topics such as the artists proposal, investigative processes, drawing and sculptural installations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 2303 (3) Beginning Relief

Emphasis on introductions to the concepts and techniques of relief processes, including white line, black line and four color reductive processes. Students will gain a working knowledge of fundamental relief processes, plus safe and appropriate use of all materials and equipment in the studio.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2403 (3) Beginning Intaglio

Emphasizes an introduction to techniques of intaglio and a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials/concepts. Emphasizes interrelationship of process, materials and ideas/aesthetics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2413 (3) Beginning Lithography

Exploration into stone lithography and aluminum plate is presented in this class. Individual direction and development of conceptual focus and studio techniques are important objectives in this class. Safer ways to make lithographs is highlighted and the toxic traditional methods are left behind.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2423 (3) Beginning Screenprinting

Exploration into screenprinting at the basic level, using stencil-making processes for screenprinting with acrylic-based screenprinting inks. Emphasis is placed on exploring and developing challenging concepts, mastering basic techniques and creating compositions and visual images that successfully convey your concept and challenge the viewer. Course is focused on the art of fine art printing on paper.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2433 (3) Beginning Alternative Printmaking

Presents creative development of concepts in printmaking beyond the traditional two-dimensional image on paper that is contained in a portfolio or frame. Focus will be made on expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 2453 (3) Beginning Monotype

Introduces the monoprint and monotype methods. Students will learn the about making non-editioned prints using a variety of four or more technical approaches. These processes will be discussed and demonstrated in depth. Students will develop a portfolio of finished prints during the semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2504 (3) Basic Sculpture: Materials and Techniques

Introduces the basic properties of metal, wood and mold making. Students will explore and demonstrate an understanding of basic fabrication methods involved in each element. Students will investigate both traditional and non-traditional working methods and will consider how materials and techniques inform sculptural concepts.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 2524 (3) Visual Thinking (Sculpture and Post-Studio Practice)

Explores ideas concerning the structure and nature of visual thinking and their relationship to the creative thought process. Investigates form in terms of the organizing principles of three-dimensional design and its application to contemporary sculpture. Includes lecture and studio projects.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 3002 (3) Drawing Alternative Process/Materials

Continuation of Drawing 2. Offers creative possibilities in drawing and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information. May be repeated once.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2002 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3012 (3) Figure Drawing

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated. Formerly ARTS 2002.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, this course provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3017 (1-3) Special Topics in Studio Arts

Introduces timely subjects in studio arts courses that cannot be offered on a regular basis. Information concerning the topics in any given semester is available prior to pre-registration from the department of Art and Art History.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 3022 (3) Intermediate Drawing

In addition to being a continuation of Beginning Drawing, Intermediate Drawing will focus on a non-traditional approach to making images encouraging conceptual development, experimentation and research. Moving beyond observation based drawings multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

Requisites: Requires prerequisite courses of ARTS 1010, 1020 and 2022 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 3054 (3) Modules and Multiples (Sculpture and Post-Studio Practices)

Exposes students to the practice of creating large works through smaller multiples and modules. By learning about the practices of artists such as Andy Warhol, Joseph Beuys, Rachel Whiteread and Robert Gober, along with many others, students will generate an understanding and appreciation for the module and multiple in contemporary art practice. Students will learn to cast using plaster and other type of molds, will be introduced to jigs as a way to streamline production of multiple objects and will work with found objects. Students will be required to complete 3 projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 3085 (3) Ceramics 3

Deals with further exploration of techniques approached in ARTH 2085 and ARTH 2095. Students are encouraged to develop personal concentration in relation to medium.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 2085 and ARTH 2095 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 3097 (1-3) Special Topics - Non-Studio

Introduces timely subjects in fine arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the Department of Art and Art History.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA) or Fine Arts-Studio (BASA and BFAS) or Fine Arts-Art History (BAAH) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 3124 (3) Intervention, Exchange, and Duration (Sculpture & Post-Studio Practice)

Focuses on the production of works of art outside of the traditional studio, museum and gallery. Projects will be designed to interrupt, intervene, co-opt, provide a service, exist for a defined amount of time, or engage a site, community or situation. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 3184 (3) Nothing Flat: Project a Week (Sculpture & Post-Studio Practice)

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produce a wide range of work over 15 weeks. Formerly ARTS 2184.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 3191 (3) Photography 3

Continues the exploration of the possibility of individual photographic expression. Students are encouraged to discover and develop a personal position in relation to the medium.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 3196 (3) Photo-Imaging

Introduces techniques, software, and related concepts of digital photography as art. Emphasizes digital photography as a means to formal and expressive ends.

Requisites: Requires prerequisite course of ARTS 1171 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 3202 (3) Painting Alternative Process/Materials

Continuation of Painting 2. Offers creative possibilities in painting and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3212 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3212 (3) Figure Painting

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated. Formerly ARTS 2202.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3222 (3) Intermediate Painting

In addition to being a continuation of Beginning Painting, this course focuses on a non-traditional approach to making paintings encouraging conceptual development, experimentation and research. Moving beyond observation based painting multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2222 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 3224 (3) Picturing Sculpture

Explores the many ways photography and other forms of imagery have been utilized in the field of sculpture. Students will start from the sculptural, but those objects and installations will function as an intermediary to creating final work that will rest in the image. Include lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3236 (3) Electronic Arts Survey

Explores the development of video as an art form through tape screenings, readings, lectures, and discussions. Prerequisite for further studies in video production.

Additional Information: Departmental Category: Media Arts

ARTS 3303 (3) Relief 1

Continued exploration of relief processes: various techniques of the collage process in combination with the art and process of the collograph. Examining the collage aesthetic, creating collages and collograph prints from found materials and objects. Other skills to be focused on include registration methods, blend rolls and the experimentation with rubbings.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2303 (all minimum grade D-).

Additional Information: Departmental Category: Printmaking

ARTS 3354 (3) Bend, Build, Burn: Sculpture in Wood

Focuses on the production of works of art in wood. Class projects explore building, bending, and burning with wood. Focuses on sculptural constructed objects although possibilities of installation, site-specific and public art will also be explored.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3384 (3) Fleeting and Found: Ephemeral Sculpture

Focuses on creating sculpture projects which are ephemeral and temporary. Themes of process, lifespan, migration, tension, entropy and degradation will be explored. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3403 (3) Intaglio 1

Exploration into techniques of Intaglio with a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials and concepts. Emphasis is placed on mastering basic techniques, creating compositions and visual images, and exploring and developing concepts that challenge the viewer.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 3413 (3) Lithography 1

Introduces the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Not available to freshmen. Taught with ARTS 4413 and ARTS 5413.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 3423 (3) Screen Printing 1

Introduces the study of silkscreen techniques, emphasizing creativity, individual development, and experimentation in contemporary silkscreen processes.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 3433 (3) Alternative Printmaking 1

Continued exploration into the development of alternative techniques and materials, methods of extending the print beyond 2-dimensions and expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2433 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 3434 (3) Collaboration: Art and Collective Action

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3453 (3) Monotype 1

A continued exploration in the monoprint and monotype methods. Use of a varied grouping of matrixes will be the focus of this class. Students will develop a portfolio of finished prints during the semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2453 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 3504 (3) Sculpture 3: Experiments 1

Explores materials, methods, and techniques through a series of assignments emphasizing individual ideas and their relationship to contemporary aesthetics.

Requisites: Requires prerequisite courses of ARTS 2504 and ARTS 2524 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 3514 (3) Sculpture 3: Experiments 2

Explores individual concepts and ideas and their relationship to contemporary issues and aesthetics. a series of assignments are worked out with the instructor based on individual interest.

Requisites: Requires prerequisite course of ARTS 3504 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 3604 (3) Beyond the Studio: Post-Studio Art Practice

Overview of post-studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3614 (3) Lost in Space: Installation Art

Students learn how to develop ideas in relation to installation art, exhibition spaces, and explore practical skills to help carry out their ideas. Includes lectures, readings and discussion, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3702 (3) Special Focus in Painting and Drawing

Offers varied focus and special topics in painting, drawing, and related media to explore specialized directions and creative possibilities.

Emphasizes experimentation. Content varies by semester; contact individual instructor for more information.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ARTS 2002 or ARTS 2202 (minimum grade D-).

Recommended: Prerequisite ARTS 3002 or ARTS 3202.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3714 (3) Experimental Structures (Sculpture and Post-Studio Practice)

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3841 (1-3) Undergraduate Independent Study---Photography

Reserved only for special projects in photography, not offered in the curriculum. Requires a detailed proposal, instructor's signature and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3191 or ARTS 4161 (minimum grade D-).

Additional Information: Departmental Category: Photography

ARTS 3842 (1-3) Undergraduate Independent Study---Painting

Reserved for special projects in painting not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3202 (minimum grade D-).

Additional Information: Departmental Category: Painting/Drawing

ARTS 3845 (1-3) Undergraduate Independent Study---Ceramics

Reserved for special projects in ceramics not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ARTS 3085 (minimum grade D-).

Additional Information: Departmental Category: Ceramics

ARTS 3847 (1-3) Independent Study

Reserved for special projects not offered in the curriculum. Department enforced prerequisite: detailed proposal, instructor sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 3906 (1-3) Undergraduate Independent Study---Video

Reserved for special projects in video not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 4246 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 3937 (1-6) Internship

Gives upper-division students the opportunity to work in public or private organizations on assignments relating to their career goals, and allows them to explore the relationship between theory and practice in their major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4002 (3) Advanced Drawing/Portfolio

Continuation of Drawing 3. Advanced studio class in drawing for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3002 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 4004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather, and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4017 (1-3) Special Topics in Studio Arts

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5017

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4024 (3) Public Art

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5024

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524 and ARTS 3504.

Additional Information: Departmental Category: Sculpture

ARTS 4085 (3) Ceramics 4

Develop a personal creative practice through self-generated, independent projects. The focus is on developing an individual studio discipline through experimentation, research, reading and writing and examining the work in individual critiques.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 4087 (3) Selected Topics in Contemporary Art

Selectively studies significant areas of visual art of the last decade including major critical opinions.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5087

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite of 20 units of ARTS or ARTH coursework completed (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4095 (3) Special Topics in Ceramics

Designed for students majoring in ceramics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5095

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 4097 (1-3) Special Topics-Non-Studio

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5097

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4104 (3) Performance/Installation

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5104

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sculpture

ARTS 4107 (1-3) Special Topics

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4117 (3) BFA Seminar

For students intending to pursue graduate work and/or a professional career in art. Emphasizes the development of a critical overview of their work and interests and how they relate to the problems of professional activity.

Requisites: Restricted to Studio Arts (AASF) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4118 (3) Visiting Artist Program

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts. Department enforced prerequisite: portfolio review.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5118

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Visiting Artist Program

ARTS 4126 (3) Digital Art 2

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5126

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4127 (3) Art from Nature

Provides an opportunity for advanced students to create nature based art. Studio work and/or appropriate on-site works will be generated through readings and individual and group experiences of nature.

Requisites: Requires prerequisite of one 4000-level ARTS course (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4130 (3) Integrated Media

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5130

Additional Information: Departmental Category: Integrated Arts

ARTS 4154 (3) Metalsmithing 1

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5154

Requisites: Requires prerequisite courses of ARTS 1010, 1020, at least one 2000-level ARTS course, and at least one 3000-level ARTS course (all minimum grade D-).

Additional Information: Departmental Category: Sculpture

ARTS 4161 (3) Photography 4

Explores advanced techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 4171 (3) New Directions in Photography

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5171

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 4176 (3) New Directions in Digital Art

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5176

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 2126 and ARTS 4316 or ARTS 5316 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4196 (3) Advanced Photo-Imaging

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5196

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2191 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 4202 (3) Advanced Painting/Portfolio

Continuation of Painting 3. Advanced studio class in painting for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3202 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 4217 (3) Art and Race/Ethnicity

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5217

Recommended: Prerequisites ARTS 1300 and ARTS 1400 or instructor consent required.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4226 (3) Advanced Computer Imaging

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5226

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 4126 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4236 (3) Electronic Arts Survey 2

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5236

Additional Information: Departmental Category: Media Arts

ARTS 4246 (3) Beginning Video Production

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5246 and FILM 4240

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4303 (3) Relief 2

Continued exploration into the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3303 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 4316 (3) History and Theory of Digital Art

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5316

Requisites: Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4327 (3) Biennial Art

Covers art represented in the most current international biennials (Documenta, Venice Biennale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5327

Requisites: Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4346 (3) Intermediate Video Production

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5346 and FILM 4340

Requisites: Requires prerequisite course of ARTS 4246 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 4403 (3) Intaglio 2

Continued exploration of techniques of intaglio process, including non-acid and ferric chloride techniques with copper as the main matrix being used. Possible processes focused on include: photo etching using solar plates and introduction to printing ala poupee wiping, chine colle and basic color. Building a unified body of work is the main focus. .

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4413 (3) Lithography 2

Continues the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Digital imaging and nontoxic processes are emphasized as much as possible. Taught with ARTS 3413 and ARTS 5413.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3413 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4423 (3) Screen Printing 2

Introduces advanced screen printing technology, emphasizing individual creativity and the ability to resolve problems of two-dimensional form.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3423 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4433 (3) Alternative Printmaking 2

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5433

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3433 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4434 (3) Collaboration: Art & Collective Action

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4444 (6) Art and Rural Environments Field School

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5444

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 4446 (3) Advanced Video Production

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5446 and FILM 4440

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 4346 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 4453 (3) Monotype 2

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5453

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3453 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4457 (3) Sound Art Seminar

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5457

Requisites: Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4504 (3) Advanced Sculpture Studio

Students in this course will be required to complete projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 3504 and ARTS 3514 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 4604 (3) Beyond the Studio: Post-Studio Art Practice

Overview of Post-Studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4607 (3) Art and Social Change

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5607

Requisites: Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4714 (3) Experimental Structures (Sculpture and Post Studio Practice)

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4717 (1-3) Studio Critique

Consists of consultations with faculty on individual studio problems and projects. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Seminars/Special Topics

Art History - Bachelor of Arts (BA)

The Art History area encourages students to analyze art within many contexts, including historical, intellectual, political, social, and stylistic. In addition to examining diverse methodologies, introductory and upper division courses cover artistic production from a wide range of cultures and periods including: Western art and architecture—Ancient, Medieval, Early Modern (Renaissance, Baroque), Modern, and Contemporary; and Art and Architecture of Asia and the Americas (Pre-Columbian, Colonial Latin American, Native North American).

Concurrent Degree Program

BA/MA in Art History

This program is open only to students enrolled in the BA art history degree program at the University of Colorado Boulder.

It is expected that the BA/MA program be completed within five years. Both degrees, BA and MA, are awarded simultaneously upon meeting all the requirements for each degree. Six credit hours (two courses) may be shared between the two programs:

1. one course outside the Department of Art and Art History, at the 3000 level or above
2. ARTH 6929

There is a formal application process with letters of recommendation, statement of intent, transcripts, GRE scores and a writing sample, as required for the two-year MA program. Students must have a minimum overall GPA of 3.00 and a GPA of 3.60 or above in the major of art history at the time of application. They take the GRE and formally apply to the graduate program during the second semester of their third (junior) year and begin taking graduate courses in the first semester of their fourth

(senior) year. By the end of the fourth year, students must complete the language requirement of at least three progressive semesters at the college level or above, in a language appropriate to their studies.

During the second semester of their senior year, students should select a thesis advisor from among the art history faculty. This faculty member will direct the student’s thesis and chair the student’s mid-program review committee. Students will be evaluated through a mid-program review during the last two weeks of April of their senior year. This is the equivalent of the first year review in the two-year MA program. It focuses on a review of student course work and performance, on selecting the major and minor areas of study in preparation for the comprehensive exam (see below) and on selection of a thesis topic.

Students will register for thesis hours during the second semester of their fifth year, pending successful completion of the comprehensive exam and approval of their thesis abstract. They will take the comprehensive exam during the first week of the second semester of the fifth year. Upon the successful completion of their comprehensive exam, they will obtain approval of their thesis abstract from their thesis committee (“pre-thesis review”) by the end of the second week of the second semester of their fifth year.

In all other details, the graduate portion of the BA/MA program is identical to the two-year MA program, as stipulated above.

Requirements

Students must complete a total of 120 semester credit hours, 45 of which must be upper-division.

Required Courses and Credit Hours

Required Courses		
ARTS 1010 & ARTS 1020	Introduction to Studio Art and Introduction to Studio Art 2	6
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	6
ARTH 4919	Capstone Seminar: Topics in Art History	3
	3000-level art history courses	9
	4000-level art history courses	12
Electives		
	ARTS or ARTH electives; fourth semester or higher foreign language is also acceptable	6
Total Credit Hours		42

Distribution Requirements

Complete at least 6 hours at the 3000 or 4000 level in each of the following areas:

- **Area 1:** African, Asian, Colonial Latin American, Pre-Columbian, Native North American, Early Modern (1400-1750)
- **Area 2:** Ancient/Late Antiquity, Medieval
- **Area 3:** Modern and/or Contemporary

Students are strongly recommended to take at least one of the following **Area 1** courses at the 3000 or 4000 level: African, Asian, Latin American, Pre-Columbian, Native North American.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of “adequate progress” as it is used here only

refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in art history, students should meet the following requirements:

- Declare the major by the beginning of the second semester.
- By the end of the third semester, complete lower-division studio courses, lower-division art history courses and two classes in upper-division art history.
- By the end of the sixth semester complete up to 32 credit hours in the major.

Art History - Minor

A minor is offered in art history. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. For more information, visit the Department of Art & Art History (<http://cuart.colorado.edu>) website.

Required Courses and Credit Hours

The minor in art history requires a minimum of 18 credit hours in art history course work, as follows:

Required Courses		
ARTH 1300	History of World Art 1	3
ARTH 1400	History of World Art 2	3
Electives		
12 credit hours of ARTH courses at the 3000- or 4000-level, with at least two courses at the 4000-level. At least one upper-division course must be completed in each of the following areas:		12
Ancient, Asian, Pre-Columbian or Native American		
Medieval, Early Modern (Renaissance/Baroque) or Colonial Latin American		
Modern, Contemporary or Theory		
Total Credit Hours		18

All course work applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor degree course work must be equal to 2.000 (C) or higher.

Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Art Practices - Bachelor of Arts (BA)

The undergraduate degree in art practices emphasizes knowledge and awareness of:

- the significance of the major monuments in art history, with an emphasis on contemporary art;
- at least one discipline of studio art;
- related critical issues in studio practice; and
- a wide range of approaches.

In addition, students completing a degree in studio art are expected to acquire the ability and skills to:

- analyze their own works of art in terms of form and content;
- interpret the work of others;
- execute ideas in one or more artistic media;

- demonstrate artistic ability and technical proficiency in one chosen medium; and communicate in verbal and written form the particular conceptual and perceptual attitudes and stances of their own artistic production.

The BA in Art Practices allows students to explore their interests and refine their skills in Art History, Ceramics, IMAP (photography, digital media, video, integrated arts), Painting and Drawing, Printmaking, and Sculpture and Post-Studio Practice. Students gain a broad understanding of the field of contemporary art and experience in contemporary art practices while pursuing a liberal arts degree at the university. **(Portfolio submission is NOT required to declare art practices as a major or minor).**

Students must complete 39 credit hours in the major. Admission to the BFA program requires a major in the Department of Art and Art History with a minimum of 30 credit hours of ARTS/ARTH and/or transfer credit hours and successful portfolio review.

Required Courses and Semester Credit Hours

Required Courses

ARTS 1010 & ARTS 1020	Introduction to Studio Art and Introduction to Studio Art 2	6
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	6
Two 2000- level courses in area of emphasis		6
Any two upper-division art history courses		6
Upper-division studio emphasis (minimum)		12
Electives		
ARTS or ARTH electives		3
Total Credit Hours		39

Graduating in Four Years with a BA in Art Practices

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in studio arts, students should meet the following requirements:

- Declare major by the beginning of the second semester.
- Complete ARTS 1010 and ARTS 1020, two level-1 studio classes and lower-division art history courses by the end of the third semester.
- Complete 30–36 credit hours in the major by the end of the sixth semester.

Art Practices - Bachelor of Fine Arts (BFA)

The BFA in Art Practices is a more in-depth degree intended for motivated students interested in and committed to pursuing a professional career in the arts. Students gain training in studio techniques and post-studio practice, an overview of historical and contemporary artists and movements, and an introduction to criticism. Additionally, students participate in the BFA Seminar, are eligible to enroll in the Visiting Artist Seminar, and present work in the culminating BFA exhibition. *This is a highly selective program. Only art majors may apply to the program with a portfolio and application materials, which are reviewed once in the fall and*

once in the spring. For application information please see below, or stop by the front office, room 330 in the VAC to pick up an application. Any BFA related questions can be directed to Anna Parsons (303) 492-3580.

For overall degree requirements run your degree audit and consult with your advisor.

You must have completed 30 semester hours in the major to apply for the BFA.

Click here to view current: BFA Application (<http://cuart.colorado.edu/wp-content/uploads/2015/10/BFA-Application-Fall-2015-Summer-20161.pdf>)

Notes and Suggestions for a Successful Application

We are looking for students who will be able to make excellent work, and work within the schedule required of a BFA student. Your track record as a student, therefore, is a very important consideration in our decision to accept you into the BFA program. To be a successful applicant, you should have:

- an excellent attendance record for your courses
- all assignments for courses completed on time
- ambitious projects: do more than what is asked for you for each assignment
- clear internal motivation. You shouldn't rely on external pressure or deadlines to make work in the studio

In the application, we are looking for:

- a thoughtful artist statement that demonstrates you have insight into your own work, and addresses the questions you are asking of yourself in your studio practice
- a body of work that goes beyond assignments completed as class work; we should start to see cohesion in the work you are making
- a high level of technical proficiency
- formal decisions in your work that support your ideas
- overall, a carefully constructed application, with good images of your work

Always feel free to consult with any of the faculty for advice on putting together your BFA application. We wish you the best of luck!

Students must complete 63 credit hours toward the major, of which at least 12 upper-division credit hours must have been completed at CU Boulder.

Students must present and pass a portfolio review to be eligible for the BFA degree (a minimum of 30 ARTS/ARTH credit hours are required to apply).

Required Courses and Credit Hours

Required Courses

ARTS 1010 & ARTS 1020	Introduction to Studio Art and Introduction to Studio Art 2	6
ARTH 1300 & ARTH 1400	History of World Art 1 and History of World Art 2	6
Two 2000-level studio courses in area of emphasis		6
Any two upper-division art history courses		6
Upper-division studio courses		18

Painting and drawing majors must take any sequence of courses culminating in ARTS 4002 or ARTS 4202.

Ceramics majors must take ARTS 4085 and ARTS 4095.

ARTS 4117	BFA Seminar	3
Electives		
Electives in ARTS or ARTH		18
Total Credit Hours		63

Note: Printmaking majors are not required to take ARTS 1003, and may register for ARTS 3403, ARTS 3413 and ARTS 3423 as sophomores.

Graduating in Four Years with a BFA in Art Practices

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in studio arts or divisional studio arts, students should meet the following requirements:

- Declare the major by the beginning of the first semester, freshman year.
- By the end of the third semester, complete ARTS 1010 and ARTS 1020, ARTH 1300 and ARTH 1400, 9 credit hours of lower-division studio, two 2000-level courses and one lower-division or upper-division studio or art history course (27 credit hours).
- Apply for the BFA in the fourth or fifth semester, with a minimum of 30 credit hours in the major.
- By the end of the sixth semester, complete up to 48 credit hours in the major.

Art Practices - Minor

The Department of Art and Art History offers a minor Art Practices for undergraduate students who are interested in studio arts but cannot undertake the Arts Practices major.

Requirements

The requirements for the minor in art practices include:

- a minimum of 21 credit hours in art practices coursework;
- all course work applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. The grade point average for all minor degree course work must be equal to 2.000 (C) or higher, and
- students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Art history majors may apply ARTS 1010 and ARTS 1020 (both major requirements) toward the completion of an art practices minor, but may not apply major electives toward completion of the minor.

Required Courses and Credit Hours

ARTS 1010	Introduction to Studio Art	3
ARTS 1020	Introduction to Studio Art 2	3
6 hrs of ARTS lower or upper division elective courses		6
At least 9 credit hours of ARTS courses at the 3000- or 4000-level		9
Total Credit Hours		21

Asian Languages and Civilizations

The Department of Asian Languages and Civilizations, founded in 1982, offers undergraduate majors in Chinese and Japanese, minors in Arabic, Chinese, Hindi/Urdu and Japanese, and certificates in Middle Eastern and Islamic Studies and South Asian Languages and Civilizations, as well as language, literature and culture courses in Arabic, Chinese, Farsi, Hindi/Urdu, Japanese and Korean.

Undergraduate students receive a thorough grounding in the modern language, an introduction to the classical language and literature and a broad familiarity with the literary and cultural history of their selected area.

Students interested in Chinese or Japanese (<https://www.colorado.edu/alc/undergraduate/majors>) are encouraged to broaden their academic horizon through a double major, combining either language with another field of interest. Likewise, students in all Asian Languages and Civilizations programs as well as programs outside the department can pursue one of the department's minors (<https://www.colorado.edu/alc/undergraduate/minors>) or certificates (<https://www.colorado.edu/alc/undergraduate/certificates>) as a way of broadening their career options.

Before registering for specific courses, students should consult with a departmental advisor (<https://www.colorado.edu/alc/undergraduate/advising>) concerning appropriate placement in language classes beyond the beginning level.

In addition to language instruction courses, the department offers several courses taught in English (<https://www.colorado.edu/alc/courses>). These courses provide an excellent introduction to the literary and cultural histories of the areas involved. They are open to all interested students and do not require previous study of the language or subjects addressed.

The department strongly encourages all students to participate in Study Abroad to enrich their studies in our programs. For information about programs throughout the world, contact the Education Abroad office (<http://abroad.colorado.edu>).

Recent graduates have found positions in such fields as government service, international business and secondary-school teaching; others have gone on to graduate study in Chinese or Japanese. Additional career opportunities can be found on the Career Services website (<http://www.colorado.edu/career>).

For more information about the Department of Asian Languages and Civilizations, please visit the department website (<https://www.colorado.edu/alc>).

Course codes for the department's six programs are ARAB, CHIN, FRSI, HIND, JPNS and KREN.

Bachelor's Degrees

- Chinese - Bachelor of Arts (BA) (p. 190)
- Japanese - Bachelor of Arts (BA) (p. 191)

Minors

- Arabic - Minor (p. 193)
- Chinese - Minor (p. 193)
- Hindi/Urdu - Minor (p. 193)

- Japanese - Minor (p. 194)

Certificates

- Middle Eastern and Islamic Studies - Certificate (p. 194)
- South Asian Languages and Civilizations - Certificate (p. 195)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adil, Sabahat Fatima (https://experts.colorado.edu/display/fisid_155862)
Assistant Professor; PhD, University of Chicago

Alexander, Katherine Laura Bos (https://experts.colorado.edu/display/fisid_157674)
Assistant Professor; PhD, University of Chicago

Arima, Yoshie (https://experts.colorado.edu/display/fisid_147528)
Instructor; MA, University of Colorado Boulder

Attwa, Mona Farrag (https://experts.colorado.edu/display/fisid_155976)
Instructor; MA, American Univ In Cairo (Egypt)

Brown, Janice Carole (https://experts.colorado.edu/display/fisid_143612)
Professor; PhD, Univ of British Columbia (Canada)

Chaturvedi, Vidhu (<http://www.colorado.edu/alc/vidhu-chaturvedi>)
Instructor

Chen, Jin (https://experts.colorado.edu/display/fisid_143539)
Instructor; MA, University of Colorado Boulder

Chung, Jae Won (<http://www.colorado.edu/alc/jae-won-chung>)
Assistant Professor

Farokhfal, Reza (https://experts.colorado.edu/display/fisid_146455)
Instructor; MA, Concordia University (Canada)

Hsu, Chun-ling (https://experts.colorado.edu/display/fisid_126783)
Instructor; MEd, University of Wisconsin-River Falls

Kim, Sangbok (https://experts.colorado.edu/display/fisid_149220)
Instructor; PhD, University of California-Los Angeles

Kimbrough, Randle Keller (https://experts.colorado.edu/display/fisid_141167)
Associate Professor; PhD, Yale University

Kleeman, Faye Yuan (https://experts.colorado.edu/display/fisid_113313)
Professor; PhD, University of California-Berkeley

Kleeman, Terry F (https://experts.colorado.edu/display/fisid_114181)
Professor; PhD, University of California-Berkeley

Kroll, Paul W (https://experts.colorado.edu/display/fisid_102408)
Professor; PhD, University of Michigan Ann Arbor

Matsunaga, Yumiko (https://experts.colorado.edu/display/fisid_149899)
Senior Instructor; MA, University of Wisconsin-Madison

Muhammed, Randa (https://experts.colorado.edu/display/fisid_152815)
Instructor; BA, South Valley University (Egypt)

Parson, Rahul Bjorn (https://experts.colorado.edu/display/fisid_156069)
Assistant Professor; PhD, University of California, Berkeley

Qian, Zhiying (https://experts.colorado.edu/display/fisid_157736)
Senior Instructor; PhD, University of California, Berkeley

Richter, Antje (https://experts.colorado.edu/display/fisid_145310)
Associate Professor; Dr habil, Univ of Kiel (Germany)

Richter, Matthias Ludwig (https://experts.colorado.edu/display/fisid_144864)
Associate Professor; PhD, Univ of Hamburg (Germany)

Stuckey, Andrew (<http://www.colorado.edu/alc/andrew-stuckey>)
Assistant Professor; PhD, UCLA

ARAB 1010 (5) Beginning Arabic 1

Introduces students to speaking, listening, reading, and writing skills in the standard means of communication in the Arab world. This course is proficiency-based. All activities within the course are aimed at placing the student in the context of the native-speaking environment from the very beginning.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Arabic
Departmental Category: Asia Content

ARAB 1011 (3) Introduction to Arab and Islamic Civilizations

Provides an interdisciplinary overview of the cultures of the Arabic-speaking peoples of Southwest Asia and North Africa from the rise of Islam in the 7th century to the present. Readings include historical, religious, literary and cultural texts from both the medieval and modern eras. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 1020 (5) Beginning Arabic 2

Continuation of ARAB 1010.

Requisites: Requires prerequisite course of ARAB 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Arabic
Departmental Category: Asia Content

ARAB 2110 (5) Intermediate Arabic 1

Proficiency-based course emphasizes speaking, listening, reading, and writing. Covers a variety of topics. Students give classroom presentations and write short essays in Arabic. Speaking ability is assessed through an oral proficiency interview.

Requisites: Requires prerequisite course of ARAB 1020 (minimum grade C).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language
Departmental Category: Arabic
Departmental Category: Asia Content

ARAB 2120 (5) Intermediate Arabic 2

Continuation of ARAB 2110.

Requisites: Requires prerequisite course of ARAB 2110 (minimum grade C).

Additional Information: Departmental Category: Arabic
Departmental Category: Asia Content

ARAB 2231 (3) Love, Loss and Longing in Classical Arabic Literature

Surveys Arabic literature from the sixth through the eighteenth centuries. It offers an introduction to Arabic literature, namely prose and poetry, through its key texts as well as the range of themes and techniques found in this literature, and it lays the groundwork for contextualizing the literature in the framework of other literary traditions. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 2320 (3) The Muslim World, 600-1250

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamic society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2320

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 3110 (3) Advanced Arabic 1

Designed to train students further in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level. Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

Requisites: Requires prerequisite course of ARAB 2120 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 3120 (3) Advanced Arabic 2

Continues training in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level. Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

Requisites: Requires prerequisite course of ARAB 3110 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 3230 (3) Islamic Culture and the Iberian Peninsula

Examines Islamic, especially Arab, culture and history as it relates to the Iberian Peninsula from 92 Ah/711 Ce to the present. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 3231 (3) In the Footsteps of Travelers: Travel Writing in Arabic Lit

Offers an excursion into the role and significance of travel and travel writing in Arabic literature in translation. We will read and discuss a range of literary works written by, about, and for travelers. More broadly, this course will offer an opportunity for undergraduates to expand their understanding of literature and the arts. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 3241 (3) Art in Islamic Cultures

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 3241

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Arabic Courses in English

ARAB 3330 (3) The Arabic Novel

Focusing on the origins and development of the novel genre in the Arabic tradition, this course examines both the aesthetic qualities of the genre as an artistic form and the ways that it has depicted and intervened in the modern social, political, and cultural upheavals that have shaped the Arab world in the 20th century. Authors include Najib Mahfuz, Abd al Rahman Munif, Hanan al-Shaykh, and Ghassan Kanafani. Taught in English.

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 3340 (3) Representing Islam

Explores the cultural politics of representations of the Arab and Islamic worlds both with an emphasis on literary representations of the Islamic world in travel narratives and novels from both the West and the Arab world. Examines historical, anthropological, and visual texts to consider how Islam has been narrated in colonial European imaginings about the Islamic world as well as contemporary representations. Taught in English.

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 3350 (3) Narrating the City: Literary Mappings of the Urban Landscape

Examines literary narratives primarily from the Arabic tradition through focusing on the relationship of literature to the development and formations of cities and urban spaces in the modern period. Begins with readings of 19th century European narratives that chronicle the changing space of the modern city followed by urban narratives from the Arabic literary tradition in order to comparatively examine how "universal" processes of modernization, development, and globalization in the modern world have been narrated. Writers include Mahfouz, Munif, al-Takarli, al-Aswani, Celik, Abu Lughod. Taught in English.

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 3410 (3) Gender, Sexuality and Culture in the Modern Middle East

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing, and constructions of gender and sexuality have been shaped by local, national and international factors. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3410

Grading Basis: Letter Grade

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 4200 (3) Advanced Readings in Arabic

Develops student proficiency and communication in modern standard Arabic at the advanced (4th year) level. Emphasis placed on developing reading comprehension, speaking, and writing skills.

Requisites: Requires prerequisite course of ARAB 3120 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 4250 (3) Arabic Media

Designed to provide students with advanced Arabic language skills for use in the media. By negotiating authentic materials in Arabic, students will gain a perspective on global issues in the Arab and Islamic world and will attain a better awareness of Arab and Islamic culture. Department enforced prerequisite: ARAB 3120 (minimum grade C) or equivalent.

Additional Information: Departmental Category: Arabic
Departmental Category: Asia Content

ARAB 4840 (1-3) Independent Study

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Arabic
Departmental Category: Asia Content

CHIN 1010 (5) Beginning Chinese 1

Introduces modern Chinese (Mandarin), developing all four skills (speaking, listening, reading and writing) and communicative strategies. Students learn both traditional full-form characters and the principles for converting them into simplified characters.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 1012 (4) Introduction to Chinese Civilization

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of China. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

CHIN 1020 (5) Beginning Chinese 2

Continuation of CHIN 1010.

Requisites: Requires prerequisite course of CHIN 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 1051 (3) Masterpieces of Chinese Literature in Translation

Surveys Chinese thought and culture through close reading and discussion of selected masterworks of Chinese literature in translation. Texts include significant works of poetry, fiction, and drama, as well as philosophical and historical writings from various eras. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

CHIN 2110 (5) Intermediate Chinese 1

Emphasizes reading, speaking, and writing modern Chinese, including continued study of both full-form and simplified characters. Introduces dictionaries and principles of character formation.

Requisites: Requires prerequisite course of CHIN 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 2120 (5) Intermediate Chinese 2

Continuation of CHIN 2110.

Requisites: Requires prerequisite course of CHIN 2110 (minimum grade C).

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 2441 (3) Film and the Dynamics of Chinese Culture

Through studying a group of Chinese films in light of modern Chinese history and literature, students examine a series of cultural dilemmas and issues in 20th century China and develop skills in analyzing literary and filmic texts. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

CHIN 3110 (5) Advanced Chinese 1

Surveys a variety of authentic-language materials, including films, plays, newspaper articles, essays, and short stories. Emphasizes proficiency-oriented approach to reading, writing, and oral communication.

Requisites: Requires prerequisite course of CHIN 2120 (minimum grade C).

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 3120 (5) Advanced Chinese 2

Continuation of CHIN 3110.

Requisites: Requires prerequisite course of CHIN 3110 (minimum grade C).

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for Chinese majors and minors. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 3200

Requisites: Restricted to students with a minimum of 45 units.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

CHIN 3311 (3) The Dao and the World in Medieval China

An interdisciplinary examination of role of Daoist and Buddhist philosophical and religious concepts and images in medieval Chinese civilization, including literature and the arts. Focuses on the personal aspects of this period of religious and intellectual ferment, tracing the representation of these ideas in Chinese poetry, prose, painting and the plastic arts as well as their role in philosophical and religious speculation. Taught in English.

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

CHIN 3321 (3) Culture and Literature of Ancient China

Focuses on the religious, cultural, philosophical and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English and taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3321

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

CHIN 3331 (3) Culture and Literature of Late Imperial China

The late imperial period was marked by growth of great metropolitan areas, expanded urban entertainments, and an extensive popular culture. Focuses on the literature and artifacts of this urban culture as well as the hegemonic culture of the state and of traditional social codes and their literary manifestations. Also considers growing contacts with the West and the transition to the modern period. All readings are in English. Taught in English.

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3334 (3) Chinese Narrative Tradition

Examines the major works of Chinese narrative tradition from the fourth to the nineteenth century. Emphasizes the reading and analysis of selected texts and understanding of the cultural and social contexts of text production and circulation. Text selections vary from year to year. Taught in English.

Recommended: Prerequisite CHIN 1012.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3341 (3) Literature and Popular Culture in Modern China

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3341

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3342 (3) Literary Culture in Contemporary China

Surveys the late 20th century Chinese and Taiwanese literature and popular culture against the historical background Market Reform in China and the lifting of Martial Law in Taiwan. Emphasizes close and critical reading skills and an understanding of how aesthetic texts critically engage within historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films, and scholarly articles. Taught in English.

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3351 (3) Reality and Dream in Traditional Chinese Literature

Explores the role of dreams in pre-modern Chinese literature from the beginnings in the 2nd millennium B.C.E. to the 19th century. The source texts will range from religious, philosophical, medical and historical writings to poetry to various genres of fictional prose and drama. Taught in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3361 (3) Women and the Supernatural in Chinese Literature

Explores the relationship between the worlds of women and the supernatural in Chinese literature, from ancient to modern times. Focuses on selected significant works of classical and vernacular fiction, religious texts, and poetry. Taught in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3371 (3) Topics in Chinese Film

Offers in-depth, critical analysis of key issues in Chinese culture as represented in Chinese film. Focuses on various topics, such as specific directors, regions, representation of gender in Chinese film, historical periods, etc. Varies from year to year. Requires no knowledge of Chinese. Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CHIN 1051 or CHIN 2441.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 4110 (3) Advanced Readings in Modern Chinese 1

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

Requisites: Requires prerequisite course of CHIN 3120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4120 (3) Advanced Readings in Modern Chinese 2

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

Requisites: Requires prerequisite course of CHIN 3120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4210 (3) Introduction to Classical Chinese

Introduces the classical language based on texts from the pre-Han and Han periods. Stresses precise knowledge of grammatical principles and exactitude in translation—the basis for all further work in classical Chinese.

Requisites: Requires prerequisite course of CHIN 2120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4220 (3) Readings in Classical Chinese

Close reading of selected texts of ancient and medieval literature. Readings in both prose and poetry. Emphasizes a disciplined, philological approach to the texts, with proper attention to diction, tone, and nuance.

Requisites: Requires prerequisite course of CHIN 4210 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4300 (3) Open Topics: Readings in Chinese Literature

Studies selected texts on a particular topic taught by regular or visiting faculty. Topics change each term.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 4750 (3) Daoism

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 5750 and RLST 4750 and RLST 5750

Requisites: Requires prerequisite course of RLST 3800 (minimum grade C).

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 4950 (3) Honors Thesis

Additional Information: Arts Sciences Honors Course
Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 4980 (1) Practical Issues in Chinese Language Pedagogy

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses. Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language. Department enforced prerequisite: CHIN 4120 (minimum grade C) or equivalent.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 5980

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

FRSI 1010 (5) Beginning Farsi 1

Provides a grounding in basic Persian Farsi grammar. The morphological and phonological nuances of the language will be introduced, along with Persian culture. Basic conversation is reinforced on a daily basis with strong emphasis and reiteration upon the homework and covered grammar.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 1011 (3) Introduction to Persian Civilization

An introduction to the history, literature and art of Iranian (Persian) civilization with a focus on the social and cultural aspects of contemporary Iran. Taught in English.

Additional Information: Departmental Category: Farsi Courses in English
Departmental Category: Asia Content

FRSI 1020 (5) Beginning Farsi 2

Continuation of FRSI 1010. Completes the presentation of basic structures of Farsi. Continued acquisition of vocabulary and practice of speaking, listening, reading, and writing. Class conducted largely in Farsi. The second half of the course will introduce authentic texts of Persian prose literature. Some poetry may be included.

Requisites: Requires prerequisite course of FRSI 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 1051 (3) Masterpieces of Persian Literature

Offers a broad introduction to Persian literature, one of the richest traditions in world literature. Students will read a selection of poetry by Rumi, Hafiz, Omar Khayyam, as well as a variety of works written by leading Iranian contemporary poets and writers. Through a close reading of literary texts, this course emphasizes their historical and cultural context.

Additional Information: Departmental Category: Farsi Courses in English

FRSI 2110 (4) Intermediate Farsi 1

Provides an intensive introduction to cultural and literary texts of Iran, along with an introduction of the grammatical and rhetorical complexities of Persian prose and poetry. Students continue to develop speaking, listening, and writing skills through activities based on the readings.

Requisites: Requires prerequisite course of FRSI 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 2120 (4) Intermediate Farsi 2

Continuation of FRSI 2110. Incorporates more readings in Persian literature, both poetry and prose, and cultural readings. Students continue developing speaking, listening and writing skills based on the readings.

Requisites: Requires prerequisite course of FRSI 2110 (minimum grade C).

Additional Information: Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 3110 (3) Advanced Farsi 1

An intensive introduction to both Persian philology and the contemporary novel. Textual analysis of texts ranging from complex to very complex will enable the students to gain a strong grounding in Persian literary texts. Students continue developing speaking, listening, and writing skills through activities based on the readings.

Requisites: Requires prerequisite course of FRSI 2120 (minimum grade C).

Additional Information: Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 3120 (3) Advanced Farsi 2

This course is the continuation of FRSI 3110. The focus will be on the reading and discussion of canonical literary texts as well as on language and media. Students continue developing speaking and listening skills through activities based on the readings and develop the ability to write short papers (3-5 pages) in Farsi.

Requisites: Requires prerequisite course of FRSI 3110 (minimum grade C).

Additional Information: Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 4900 (1-4) Independent Study

Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Farsi

Departmental Category: Asia Content

HIND 1010 (5) Beginning Hindi 1

Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading, and writing skills. This course is proficiency-based. Activities aim to place the student in the context of the native-speaking environment from the very beginning. Students will be provided with opportunities to participate in local South Asian cultural events.

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Hindi

Departmental Category: Asia Content

HIND 1011 (3) Introduction to South Asian Civilizations

Survey of traditional and modern world views and experiences of people on the Indian subcontinent through literature and film, beginning with the Ramayana and including medieval tales, modern novels, and feature films. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

HIND 1020 (5) Beginning Hindi 2

Continuation of HIND 1010. Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading and writing skills. Proficiency-based course aims to place the student in the context of the native-speaking environment from the beginning of the course. Provides opportunities to participate in local South Asian cultural activities and events.

Requisites: Requires prerequisite course of HIND 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Hindi

Departmental Category: Asia Content

HIND 2110 (5) Intermediate Hindi 1

Emphasizes speaking, listening, reading and writing skills and culturally appropriate language use.

Requisites: Requires prerequisite course of HIND 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Hindi

Departmental Category: Asia Content

HIND 2120 (5) Intermediate Hindi 2

Continuation of HIND 2110. Enhances students' speaking, listening, reading and writing skills and culturally appropriate language use.

Requisites: Requires prerequisite course of HIND 2110 (minimum grade C).

Additional Information: Departmental Category: Hindi

Departmental Category: Asia Content

HIND 3110 (3) Advanced Hindi 1

Emphasizes speaking, listening and conversational fluently in Hindi, with a focus on cultural appropriate expression and practical knowledge.

Requisites: Requires prerequisite course of HIND 2120 (minimum grade C).

Additional Information: Departmental Category: Hindi

Departmental Category: Asia Content

HIND 3120 (3) Advanced Hindi 2

Continuation of HIND 3110. Emphasizes reading, listening, and speaking fluency in Hindi-Urdu, with a focus on literary, cinematic and cultural themes in modern and contemporary Hindi-Urdu media and culture. Thematic focus of the course may change each semester. An effort will be made to encourage students to put their language skills into literary and cultural context.

Requisites: Requires prerequisite course of HIND 3110 (minimum grade C).

Additional Information: Departmental Category: Hindi

Departmental Category: Asia Content

HIND 3400 (3) Special Topics

Topics in Hindi. No prerequisites.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Hindi

Departmental Category: Asia Content

HIND 3441 (3) Screening India: A History of Bollywood Cinema

Provides a critical overview of one of the world's largest and most beloved film industries, the popular Hindi cinema produced in Bombay (Mumbai) and consumed around the world under the label "Bollywood". Focus on the post-Independence era to the present, with introduction to key films, directors, stars, genres, formal techniques, and themes, as well as critical analyses of these and other topics. Taught in English.

Additional Information: Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

HIND 3651 (3) Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination

Explores the Ramayana and Mahabharata, two fundamental mythological pillars of Indian society, through literature, comic books, film, television, and political rhetoric as a means of examining major issues of religion, gender, popular culture, and social politics in contemporary India. Taught in English.

Additional Information: Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

HIND 3661 (3) South Asian Diasporas: Imagining Home Abroad

Examines fundamental questions of home, nation, identity, ethnicity, and foreignness in the context of the enormous South Asian diaspora. By means of literature, ethnography, and film, the various connotations of diaspora will be explored along with the cultural productions of members of the South Asian diaspora (both Indian and Pakistani). Taught in English.

Additional Information: Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

HIND 3811 (3) The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature

Provides an overview of a selection of writings by important 20th century Indo-Pakistani authors, which will permit students to get acquainted with Indian literature. Provides insight into the experience of social and political events in the 20th century and the reaction of the government to the critical analysis and portrayal of these events. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Hindi Courses in English

Departmental Category: Asia Content

HIND 3831 (3) The Many Faces of Krishna in South Asia Literature and Culture

Using both textual and visual sources, the multiple facets of Krishna in Indian religious experience will be explored through poetry and prose, painting and sculpture, music, dance, and drama. Taught in English.

Additional Information: Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 3851 (3) Devotional Literature in South Asia

Focuses on the medieval and modern periods (1200-present), and the languages of North India and Pakistan (Hindi, Urdu, Panjabi). Students engage with English translations of works by Tulsidas, Surdas, Kabir, Mirabai, Nanak, Khusrau, Ghalib, Anis and Iqbal. Recurring themes include issues of authorship and interpretation; religious and aesthetic encounter; and the legacy of these traditions in modern South Asian society and literature. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 4900 (1-3) Independent Study

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Hindi

JPNS 1010 (5) Beginning Japanese 1

Provides a thorough introduction to modern Japanese, emphasizing speaking, listening, reading, and writing in a cultural context.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 1012 (4) Introduction to Japanese Civilization

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of Japan. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

JPNS 1020 (5) Beginning Japanese 2

Continuation of JPNS 1010.

Requisites: Requires prerequisite course of JPNS 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 1051 (3) Masterpieces of Japanese Literature in Translation

Surveys Japanese thought and culture through careful reading and discussion of selected masterworks of Japanese literature in translation. Texts include significant works of poetry, fiction, drama, diaries, and essays, from ancient times to the present. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

JPNS 2110 (5) Intermediate Japanese 1

Continued study of oral and written modern Japanese in a cultural context.

Requisites: Requires prerequisite course of JPNS 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 2120 (5) Intermediate Japanese 2

Continuation of JPNS 2110.

Requisites: Requires prerequisite course of JPNS 2110 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 2441 (3) Japanese Culture through Film and Anime

Examines 20th century Japanese culture through cinematic and animated films. Studies films by Ozu, Kurosawa, Mizoguchi, and contemporary animators Tezuka, Miyazaki, and Kon Satoshi. Considers cultural issues raised in film and anime in light of modern Japanese history and literature. Requires no knowledge of Japanese. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

JPNS 2811 (3) Heroes and the Supernatural: Word and Image in Old Japan

Examines the fusion of literary and visual arts in twelfth- to nineteenth-century Japan, focusing on illustrated handscrolls and narrative paintings. Students will explore tales of monsters, samurai, fantastic journeys to other worlds, anthropomorphic animals, and the eighteenth- and nineteenth-century precursors of contemporary Japanese comics. This course seeks to analyze visual-literary texts in their historical contexts as both literature and art. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

JPNS 3110 (5) Advanced Japanese 1

Enhances student competence and performance in Japanese language in a holistic and integrative manner.

Requisites: Requires prerequisite course of JPNS 2120 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 3120 (5) Advanced Japanese 2

Continuation of JPNS 3110. Enhances student competence and performance in Japanese language in a holistic and integrative manner.

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for Japanese majors and minors. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 3200

Requisites: Restricted to students with a minimum of 45 units.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

JPNS 3311 (3) Japanese Colonial and Transnational Literature

Explores the development of Japanese and colonial identities in literature produced in and about Japan's colonies during the first half of the 20th century. We will read works written during and about the Japanese empire by Chinese, Japanese, Korean, Okinawan and Taiwanese writers looking at the different representations of empire. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

JPNS 3321 (3) Fantasy and Sci-Fi in Japanese Literature, Film and Culture

Explores the development of Japanese science fiction and fantasy literature produced in the past century. We will read works written by writers such as Abe Kobo, Hoshi Shin'ichi, Kurahashi Yumiko, Ueda Sayuri and Project Ito. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

JPNS 3331 (3) Business Japanese

Designed to teach Japanese with emphasis on using Japanese for professional purposes. The course aims to foster the skills and the knowledge of effective cross-cultural and interpersonal communication in Japanese and to develop intercultural competence in business contexts.

Requisites: Requires prerequisite course of JPNS 2120 (minimum grade C).

Recommended: Prerequisite JPNS 3110.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 3511 (3) From Rebellion to Calamity: Contemp Japanese Lit in Transl

Explores post-1945 Japanese literature through close reading of prose fiction (including SF, mystery, horror, e-novel and cell-phone novel genres), poetry, visual narratives (manga) and critical essays. Texts will be considered in historical and cultural contexts, with attention to their relationship to traditional arts and global trends. Taught in English.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese Courses in English

JPNS 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3811

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3821 (3) Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation

Surveys the major works and authors of medieval Japanese (poetry, prose, and drama) from the Kamakura and Muromachi periods (1185-1600). Taught in English.

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3831 (3) The Floating World of Play and Passion: Early Modern Japanese Literature in Translation

Surveys the major works, authors, and genres of literature from the Tokugawa through Meiji periods in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3841

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3851 (3) Studies in Japanese Popular Culture

Introduces aspects of Japanese popular culture from the early 1990s economic collapse until the present through a variety of artistic mediums including manga, anime, literature, live-action cinema, video gaming, music, and the visual arts. Taught in English.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3861 (3) Imagining the Samurai in Japanese Literature and Culture

Explores the rich history of the imagination of the samurai in Japan, across multiple genres of fiction, poetry, drama, visual art, and cinema, from earliest times to the present. Attention is given to the varied meanings the image of the samurai has held at different historical moments, and to contrasts between the representations of the realities of samurai life. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3871 (3) Horror and the Macabre in Japanese Literature, Film, Culture

Explores Japanese horror texts from both the pre-modern and modern eras in a variety of genres, including the monogatari, kaidan, kabuki, contemporary horror fiction, film and anime. Texts will be considered in historical and cultural context with attention being given to interactions with and within popular culture. Taught in English.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3881 (3) Environment, Nature and Disaster in Japanese Literature and Culture

Explores the significance of the environment, nature and disaster in Japanese literature and culture through readings in a variety of genres, including fiction, essay, poetry, sci-fi, film and anime. Attention will also be given to environmental/ecological issues, such as conservation, pollution, biodiversity and industrial development. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Literature and the Arts

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3891 (3) Travel/Travel Writing in Japanese Literature and Culture

Explores selected Japanese literary and cultural texts that treat travel and travel writing, including short and long fiction, poetry, memoir, nonfiction, biography and travel commentary. Taught in English.

Recommended: Prerequisite JPNS 1051.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 4030 (3) Japanese Syntax

Deals with syntactic phenomena from five areas of Japanese grammar that cause the most difficulty for learners. Their characteristics are explored in forms and discursal functions that go beyond the explanations in basic, prescriptive grammars of Japanese. Department enforced prerequisite: JPNS 3120 or JPNS 4120 (minimum grade C) or instructor consent.

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4050 (3) Japanese Sociolinguistics: Japanese Language and Society

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5050 and LING 4050

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4070 (3) Second Language Acquisition of Japanese

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5070

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4080 (3) Kanji in Japanese Orthography

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5080

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4110 (3) Advanced Readings in Modern Japanese 1

Surveys a variety of material written in modern Japanese, including texts from literature, the social sciences, religion, and cultural history. Emphasizes content and style. Texts and selections vary from year to year.

Requisites: Requires prerequisite course of JPNS 3120 (minimum grade C).

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4120 (3) Advanced Readings in Modern Japanese 2

Continuation of JPNS 4110. Texts and selections vary from year to year.

Requisites: Requires prerequisite course of JPNS 4110 (minimum grade C).

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4150 (3) Japanese to English Translation: Theory and Practice

Introduction to a range of translation tasks and approaches, as well as to professional translation practices, ethics, methods and resources. Emphasis is on application, through translation of representative texts from Japanese into English in the fields of social science, humanities and the arts, journalism, and commerce.

Recommended: Prerequisite JPNS 3110.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4210 (3) Contemporary Japanese 1: Current Issues

Offers intensive review of Japanese language skills beyond the first eight semesters and cultivates further proficiency. Readings will be selected from a wide range of contemporary writings that reflect and represent issues in Japanese as well as global communities. Emphasizes all skills: reading, listening, writing, speaking and translation. Instructional technology is extensively integrated into the curriculum.

Requisites: Requires prerequisite course of JPNS 4120 (minimum grade C).

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4300 (3) Open Topics: Readings in Japanese

Examines selected texts on a particular topic taught by regular or visiting faculty. Topics change each term. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4310 (3) Classical Japanese 1

Introduces reference tools for reading classical Japanese, and grammar, vocabulary, and use of scripts in premodern Japanese, focusing on the 10th century Taketori Monogatari and the 13th century Hojoki.

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Recommended: Prerequisites JPNS 3120 and JPNS 3811 and JPNS 3821.

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4320 (3) Classical Japanese 2

Continuation of JPNS 4310. Surveys changes in Japanese literary language from the Nara (eighth century) to Meiji (late 19th century) periods. Attention given to changes in grammar, vocabulary, and use of scripts in premodern Japanese. Introduces representative works of classical Japanese literature of all periods.

Requisites: Requires prerequisite course of JPNS 4310 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4400 (3) Critical Theory and Japanese Literature and Culture

Examines Japanese literary and cultural texts through the lens of specific theoretical paradigms as developed by Japanese and non-Japanese thinkers and academicians. Taught in English.

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

JPNS 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4950 (3) Honors Thesis

Additional Information: Arts Sciences Honors Course
Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4980 (1) Practical Issues in Japanese Language Pedagogy

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language class. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning. Department enforced prerequisite: JPNS 4120 (minimum grade C) or equivalent.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5980

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

KREN 1010 (5) Beginning Korean 1

Trains students in elementary conversational and writing skills and provides grounding in the basic idiomatic and syntactical features of Korean, through lectures, drills, and language laboratory sessions based on set dialogues and readings.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Korean
Departmental Category: Asia Content

KREN 1011 (3) Introduction to Korean Civilization

Introduces the history of Korean culture within the context of political, social, and economic history. Covers the old Choson dynasty to present day Korea. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Korean Courses in English
Departmental Category: Asia Content

KREN 1020 (5) Beginning Korean 2

Continuation of KREN 1010.

Requisites: Requires prerequisite course of KREN 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Korean
Departmental Category: Asia Content

KREN 2110 (5) Intermediate Korean 1

Extends the conversational and written skills acquired at the elementary level. Although emphasis remains on spoken Korean, readings are increased, elementary writing skills are introduced gradually, and some Sino Korean characters are taught.

Requisites: Requires prerequisite course of KREN 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Korean
Departmental Category: Asia Content

KREN 2120 (5) Intermediate Korean 2

Continuation of KREN 2110.

Requisites: Requires prerequisite course of KREN 2110 (minimum grade C).

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

KREN 2441 (3) Film and Korean Culture

Introduces Korean/South Korean cinema from colonial period to the contemporary including old Korean black and white films, the earliest talkie films and contemporary art films. Considers cinema as a window to see the tumultuous and diverse culture of modern Korea. Taught in English. No prior knowledge of Korea, Korean film or film art is required.

Additional Information: Departmental Category: Korean Courses in English
Departmental Category: Asia Content

KREN 3110 (5) Advanced Korean 1

Promotes an advanced level of speaking, reading, and writing. Focuses on contemporary business Korean language as reflected in various Korean media such as newspapers, magazines, and television. The goal is to acquire Korean language skills at a level that allows students to conduct business activities.

Requisites: Requires prerequisite course of KREN 2120 (minimum grade C).

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

KREN 3120 (5) Advanced Korean 2

This second semester of Korean offers advanced level speaking and writing. Focuses on understanding contemporary Korean languages as reflected in various communication media, such as print, TV, and films to help students understand Korean in a variety of contexts.

Requisites: Requires prerequisite course of KREN 3110 (minimum grade C).

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

KREN 3841 (3) Modern Korean Literature in English Translation

Surveys masterpieces of modern Korean literature written by significant Korean/Korean American authors in English. Provides various literary and theoretical frameworks to understand Korean literature within the context of Asian global culture. Covers from colonial period to the present. Taught in English. No prior knowledge of Korea or Korean literature is required.

Additional Information: Departmental Category: Korean Courses in English

Departmental Category: Asia Content

KREN 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

Chinese - Bachelor of Arts (BA)

The undergraduate degree in Chinese emphasizes knowledge and awareness of:

- Chinese literary history, focusing on selected canonical or widely recognized works;
- the historical and cultural contexts in which particular works were written;
- critical approaches to the study of Chinese language and civilization; and
- the challenges, deficiencies and possible gains inherent in the process of translating from one language to another.

In addition, students completing the degree in Chinese are expected to acquire the ability and skills to:

- read modern Chinese at a level at which critical literary analysis can be performed;
- read classical Chinese, with the aid of appropriate reference works, at the level at which the text may begin to be appreciated for its literary value;
- speak and comprehend Mandarin sufficient for all situations in daily life and for a basic level of academic conversation;
- analyze and interpret literary texts in terms of style, structure, character, themes and use of allusion; and
- communicate such interpretations competently in standard written English.

With a Chinese major (<https://www.colorado.edu/alc/undergraduate/majors>), students will have skills, information and concepts that are relevant to careers in virtually every area. Competency in a foreign language is a highly desirable skill in all fields. A knowledge of Chinese is particularly beneficial and useful in business, engineering, industry, commerce, the civil or foreign service, law, library science, natural and social sciences, the media, economics, public administration, journalism, government and teaching at all levels. In addition, China is an increasing source of a wide variety of excellent careers, as it is among the world's largest economies (<http://databank.worldbank.org/data/download/GDP.pdf>) and trading partners with the U.S. (http://www.trade.gov/mas/ian/build/groups/public/@tg_ian/documents/webcontent/tg_ian_003364.pdf) and Colorado. Students are encouraged to consider combining their Chinese language training with courses in these or other fields. Additional career opportunities can be found on the Career Services website (<http://www.colorado.edu/career>).

Concurrent Degree Programs BA/MA in Chinese and Asian Languages and Civilizations

The concurrent BA/MA (Bachelor of Arts / Master of Arts) degree program in Chinese recognizes the need for master's-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the Chinese language, knowledge of the culture of China and its literature and the skills acquired by BA and MA graduates in the humanities: research, analysis, interpretation, translation and communication.

This degree offers a challenging and focused academic experience for exceptional students (particularly those who enter the university with significant preparation in Chinese studies from high school or with other backgrounds, or those who participate in study abroad opportunities at CU) who demonstrate the ability to express their ideas clearly, both orally and in written form, using standard English. Highly motivated students who are accepted into the program begin graduate work no later than the senior year and earn both the BA and MA in five years. Students must have a minimum 3.25 GPA for all courses taken at CU Boulder and should have completed all MAPS and core requirements by the end of the sophomore year.

The application is open only to CU Boulder students. Students must submit the written application for admission (<http://www.colorado.edu/graduateschool/academic-forms>), along with a statement of purpose, a writing sample and three letters of recommendation, at least one from a full-time member of the Chinese faculty, by September 1 of their junior year (or, in exceptional circumstances, during a student's senior year) to the director of graduate studies in Chinese (<https://www.colorado.edu/alc/graduate/advising>). Applications will be reviewed by the graduate faculty of Chinese. Students interested in applying for this option must consult with the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) early in their career at CU to establish their program of study.

Specific information about the BA/MA requirements and curriculum (<https://www.colorado.edu/alc/graduate/chinese>) can be found on the department website.

BA/MSIB in Chinese

The Department of Asian Languages and Civilizations, in conjunction with the Business School at the University of Colorado Denver, offers a degree track in Chinese leading to accelerated admission to the CU Denver MSIB (Master of Science in International Business) program. Students complete the standard requirements for the Chinese major and the business minor in the Boulder Leeds School of Business. Business courses from the undergraduate degree count toward prerequisites for the MSIB program. For more information, see the CU Denver MSIB website (<http://www.ucdenver.edu/academics/colleges/business/degrees/ms/ib/Pages/International-Business.aspx>).

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. CHIN 1010, CHIN 1020 and CHIN 2110 do not count toward the maximum of 45 credit hours in the major department.

The major program for the BA degree in Chinese requires successful completion of 30 credit hours, of which at least 18 credit hours must be at the upper-division level.

Required Courses and Semester Credit Hours

Required Courses

CHIN 2120	Intermediate Chinese 2	5
CHIN 3110	Advanced Chinese 1	5
CHIN 3120	Advanced Chinese 2	5
CHIN 4210	Introduction to Classical Chinese ¹	3

Electives

The remaining 12 credit hours may be chosen from the courses listed below; 3 of these credit hours may be satisfied by courses focusing wholly or substantially on China offered in other departments, subject to approval by the Chinese undergraduate faculty advisor.

CHIN 1012	Introduction to Chinese Civilization	
CHIN 1051	Masterpieces of Chinese Literature in Translation	
CHIN 2441	Film and the Dynamics of Chinese Culture	
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	
CHIN 3311	The Dao and the World in Medieval China	
CHIN 3321	Culture and Literature of Ancient China	
CHIN 3331	Culture and Literature of Late Imperial China	
CHIN 3334	Chinese Narrative Tradition	
CHIN 3341	Literature and Popular Culture in Modern China	
CHIN 3342	Literary Culture in Contemporary China	
CHIN 3351	Reality and Dream in Traditional Chinese Literature	
CHIN 3361	Women and the Supernatural in Chinese Literature	
CHIN 3371	Topics in Chinese Film (taught in English)	
CHIN 4110	Advanced Readings in Modern Chinese 1 ¹	
CHIN 4120	Advanced Readings in Modern Chinese 2 ¹	
CHIN 4220	Readings in Classical Chinese ¹	
CHIN 4300	Open Topics: Readings in Chinese Literature	
CHIN 4750	Daoism	
CHIN 4900	Independent Study	
CHIN 4950	Honors Thesis	

Total Credit Hours 30

¹ Transfer credit for these courses, whether from universities in this country or abroad, will be considered only in exceptional cases; normally, no credit toward the major will be given for these courses unless taken in residence.

Graduating in Four Years with a BA in Chinese

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of “adequate progress” as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Chinese, students should meet the following requirements:

- Declare the major by the first semester of sophomore year.
- Students wishing to major in Chinese and who have no prior knowledge of the language should begin the required major courses no later than the sophomore year.
- Students must consult with the department’s undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/>

advising) to determine adequate progress toward completion of the major. An example four-year plan (<https://www.colorado.edu/alc/undergraduate/majors>) is available on the department website.

Japanese - Bachelor of Arts (BA)

The undergraduate degree in Japanese emphasizes knowledge and awareness of:

- the outlines of the history of Japanese literature from the Nara period to the present;
- the outlines of Japanese historical and cultural development; and
- appropriate research strategies for Japanese language, literature and culture.

In addition, students completing the degree in Japanese are expected to acquire the ability and skills to:

- speak and comprehend Japanese sufficiently for daily life;
- read, interpret and analyze modern written texts;
- compose letters and simple compositions;
- use cultural awareness and understanding to function appropriately in a range of social situations; and
- communicate the results of research in English.

In addition, students target one or more of the following goals:

- read and comprehend classical Japanese, with the aid of appropriate reference works;
- translate a range of Japanese texts into English; and
- understand and analyze the structure of the Japanese language and communication patterns in Japanese.

With a Japanese major (<https://www.colorado.edu/alc/undergraduate/majors>), students will have skills, information and concepts that are relevant to careers in virtually every area. Competency in a foreign language is a highly desirable skill in all fields. A knowledge of Japanese is particularly beneficial and useful in business, engineering, industry, commerce, the civil or foreign service, law, library science, natural and social sciences, the media, economics, public administration, journalism, government and teaching at all levels. In addition, Japan is an increasing source of a wide variety of excellent careers, as it is among the world’s largest economies (<http://databank.worldbank.org/data/download/GDP.pdf>) and trading partners with the U.S. (http://www.trade.gov/mas/ian/build/groups/public/@tg_ian/documents/webcontent/tg_ian_003364.pdf) and Colorado. Students are encouraged to consider combining their Japanese language training with courses in these or other fields. Additional career opportunities can be found on the Career Services website (<http://www.colorado.edu/career>).

Concurrent Degree Programs

BA/MA in Japanese and Asian Languages and Civilizations

The concurrent BA/MA (Bachelor of Arts / Master of Arts) degree program in Japanese recognizes the need for master’s-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the Japanese language, knowledge of the culture of Japan and its literature and the skills acquired by BA and MA graduates in the humanities: research, analysis, interpretation, translation and communication.

This degree offers a challenging and focused academic experience for exceptional students (particularly those who enter the university with significant preparation in Japanese studies from high school or with other backgrounds, or those who participate in study abroad opportunities at CU) who demonstrate the ability to express their ideas clearly, both orally and in written form, using standard English. Highly motivated students who are accepted into the program begin graduate work no later than the senior year and earn both the BA and MA in five years. Students must have a minimum 3.25 GPA for all courses taken at CU Boulder and should have completed all MAPS and core requirements by the end of the sophomore year.

The application is open only to CU Boulder students. Students must submit the written application for admission (<http://www.colorado.edu/graduateschool/academic-forms>), along with a statement of purpose, a writing sample and three letters of recommendation, at least one from a full-time member of the Japanese faculty, by September 1 of their junior year (or, in exceptional circumstances, during a student's senior year) to the director of graduate studies in Japanese (<https://www.colorado.edu/alc/graduate/advising>). Applications will be reviewed by the graduate faculty of Japanese. Students interested in applying for this option must consult with the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) early in their career at CU to establish their program of study.

Specific information about the BA/MA requirements and curriculum (<https://www.colorado.edu/alc/graduate/japanese>) can be found on the department website.

BA/MSIB in Japanese

The Department of Asian Languages and Civilizations, in conjunction with the Business School at the University of Colorado Denver, offers a degree track in Japanese leading to accelerated admission to the CU Denver MSIB (Master of Science in International Business) program. Students complete the standard requirements for the Japanese major and the business minor in the Boulder Leeds School of Business. Business courses from the undergraduate degree count toward prerequisites for the MSIB program. For more information, see the CU Denver MSIB website (<http://www.ucdenver.edu/academics/colleges/colleges/business/degrees/ms/ib/Pages/International-Business.aspx>).

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. JPNS 1010, JPNS 1020 and JPNS 2110 do not count toward the maximum of 45 credit hours in the major department.

The major program for the BA degree in Japanese requires successful completion of 30 credit hours, of which at least 18 credit hours must be at the upper-division level.

Required Courses and Semester Credit Hours

Required Courses

JPNS 2120	Intermediate Japanese 2	5
JPNS 3110	Advanced Japanese 1	5
JPNS 3120	Advanced Japanese 2	5

Electives

The remaining 15 credit hours should be chosen from the courses listed below; 6 of these credit hours may be satisfied by courses focusing wholly or substantially on Japan offered in other departments, subject to approval by the Japanese undergraduate faculty advisor; and 9 of these credit hours must be at the upper-division level.

JPNS 1012	Introduction to Japanese Civilization (Core: Human Diversity)	15
JPNS 1051	Masterpieces of Japanese Literature in Translation (Core: Lit & Arts)	
JPNS 2441	Japanese Culture through Film and Anime	
JPNS 2811	Heroes and the Supernatural: Word and Image in Old Japan	
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization (Core: Upper Division Written Communication)	
JPNS 3331	Business Japanese	
JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl	
JPNS 3811	Love, Death, and Desire: Classical Japanese Literature in Translation	
JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation	
JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation	
JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation	
JPNS 3851	Studies in Japanese Popular Culture	
JPNS 3861	Imagining the Samurai in Japanese Literature and Culture	
JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture	
JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture	
JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture	
JPNS 4030	Japanese Syntax	
JPNS 4050	Japanese Sociolinguistics: Japanese Language and Society	
JPNS 4070	Second Language Acquisition of Japanese	
JPNS 4080	Kanji in Japanese Orthography	
JPNS 4110	Advanced Readings in Modern Japanese 1 ¹	
JPNS 4120	Advanced Readings in Modern Japanese 2 ¹	
JPNS 4150	Japanese to English Translation: Theory and Practice	
JPNS 4210	Contemporary Japanese 1: Current Issues	
JPNS 4300	Open Topics: Readings in Japanese	
JPNS 4310	Classical Japanese 1 ¹	
JPNS 4320	Classical Japanese 2 ¹	
JPNS 4400	Critical Theory and Japanese Literature and Culture	
JPNS 4900	Independent Study	
JPNS 4950	Honors Thesis	

Total Credit Hours 30

¹ *Transfer credit for these courses, whether from universities in this country or abroad, will be considered only in exceptional cases; normally, no credit toward the major will be given for these courses unless taken in residence.*

Graduating in Four Years with a BA in Japanese

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of “adequate progress” as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Japanese, students should meet the following requirements:

- Declare the major by the first semester of sophomore year.
- Students wishing to major in Japanese and who have no prior knowledge of the language should begin the required major courses no later than the sophomore year.
- Students must consult with the department’s undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) to determine adequate progress toward completion of the major. An example four-year plan is available on the department website (<https://www.colorado.edu/alc/undergraduate/majors>).

Arabic - Minor

A minor in Arabic Studies can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of the Middle East and North Africa. Students cannot declare both the Certificate in Middle Eastern and Islamic Studies and the Minor in Arabic Studies.

For more information, visit the department’s Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department’s undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

Requirements

A minimum of 19 credit hours must be taken in Arabic language and literature courses, including a total of 9 upper-division credit hours.

Required Courses and Semester Credit Hours

Required Courses

ARAB 2110	Intermediate Arabic 1	5
ARAB 2120	Intermediate Arabic 2	5

Electives		9
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At least three additional upper-division, 3-credit-hour ARAB courses. At least one of the content courses must focus on the premodern period.

ARAB 3110	Advanced Arabic 1	
ARAB 3230	Islamic Culture and the Iberian Peninsula	
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit	
ARAB 3241	Art in Islamic Cultures	
ARAB 3330	The Arabic Novel	
ARAB 3340	Representing Islam	
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape	

ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East	
Total Credit Hours		19

Pass/fail work will not apply to the minor. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Chinese - Minor

A minor in Chinese can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of China.

For more information, visit the department’s Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department’s undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

Requirements

A minimum of 18 credit hours must be taken in Chinese language and literature courses, including a total of 13 upper-division credit hours.

Required Courses and Semester Credit Hours

Required Courses

CHIN 2120	Intermediate Chinese 2	5
CHIN 3110	Advanced Chinese 1	5
CHIN 3120	Advanced Chinese 2	5

Electives

At least one additional upper-division, 3-credit-hour CHIN course.		3
Total Credit Hours		18

Pass/fail work and CHIN 3200 will not apply to the minor. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Hindi/Urdu - Minor

A minor in Hindi/Urdu Studies can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of South Asia. Students cannot declare both the Certificate in South Asian Languages and Civilizations and the Minor in Hindi/Urdu Studies.

For more information, visit the department’s Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department’s undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

Requirements

A minimum of 19 credit hours must be taken in Hindi/Urdu language and literature courses, including a total of 9 upper-division credit hours.

Required Courses and Semester Credit Hours

Required Courses

HIND 2110	Intermediate Hindi 1	5
HIND 2120	Intermediate Hindi 2	5

Electives		9
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At least three additional upper-division, 3-credit-hour HIND courses.

HIND 3110	Advanced Hindi 1	
HIND 3441	Screening India: A History of Bollywood Cinema	
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination	
HIND 3661	South Asian Diasporas: Imagining Home Abroad	
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature	
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture	
HIND 3851	Devotional Literature in South Asia	
Total Credit Hours		19

Pass/fail work will not apply to the minor. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Japanese - Minor

A minor in Japanese can be selected by students who wish to gain a basic understanding of the language as well as history, culture and literary traditions of Japan.

For more information, visit the department's Minors (<http://www.colorado.edu/alc/undergraduate/minors>) webpage or see the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>).

Requirements

A minimum of 18 credit hours must be taken in Japanese language and literature courses, including a total of 13 upper-division credit hours.

Required Courses and Semester Credit Hours

Required Courses

JPNS 2120	Intermediate Japanese 2	5
JPNS 3110	Advanced Japanese 1	5
JPNS 3120	Advanced Japanese 2	5

Electives

At least one additional upper-division, 3-credit-hour JPNS course.		3
Total Credit Hours		18

Pass/fail work will not apply to the minor. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor.

Middle Eastern and Islamic Studies - Certificate

The Certificate in Middle Eastern and Islamic Studies provides students the opportunity to formally explore the cultural, political and religious diversity of the Middle East and the Islamic worlds.

The region commonly referred to as the Middle East includes over 20 Arabic speaking countries, as well as Iran, Turkey, and Israel and spans Southwest Asia and North Africa. A culturally, religiously and linguistically diverse region, the Middle East today is one of the most geopolitically critical regions in the world. It is the birthplace of the three major monotheistic faiths, Judaism, Christianity and Islam; the home of medieval Islamic civilizations; and home to rich literary, architectural and religious traditions. Islam, a monotheistic faith that began in the

Arabian Peninsula in the 7th century, is today practiced by over one billion people and is diversely expressed through a vast geographic, linguistic and cultural terrain, from West Africa to East Asia.

Students currently pursuing the requirements of the Certificate in Middle Eastern and Islamic Studies (MEIS) or interested in doing so should complete the Statement of Intent form (<https://www.colorado.edu/alc/undergraduate/certificates>) available on the department website. Students who have completed the requirements for the MEIS certificate and are graduating in December or May must complete the Program of Study form (<https://www.colorado.edu/alc/undergraduate/certificates>) and the Certificate Completion form (<https://www.colorado.edu/alc/undergraduate/certificates>), also available on the department website, and submit them to the MEIS certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) two months prior to graduation.

Students cannot declare both the Certificate in Middle Eastern and Islamic Studies and the Minor in Arabic.

Requirements

The certificate requires a total of 19 credit hours, which include both language and content courses.

Required Courses: At least one year of either Arabic or Farsi language courses beginning at the intermediate level (2000 level) with a grade of C or better. A student who participates in an approved study abroad program may earn up to 10 credit hours for language study at an intermediate or advanced level.

Electives: Three courses, at least one of which must be a course designated ARAB and has a specific focus on Islam and the Islamic world. These nine credit hours may be selected from the list of approved content courses below and are to be completed with a grade of C- or better. Approval of study abroad credits for content courses will be reviewed on a case-by-case basis.

Possible Electives Include:

ANTH/JWST 4050	Anthropology of Jews and Judaism (Cultures of Israel & Palestine)
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Global Islams)
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature
ARAB/RLST 2320	The Muslim World, 600-1250
ARAB 3230	Islamic Culture and the Iberian Peninsula
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit
ARAB 3241	Art in Islamic Cultures
ARAB 3330	The Arabic Novel
ARAB 3340	Representing Islam
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
GEOG 3742	Place, Power, and Contemporary Culture
GEOG 4742	Topics in Environment and Society (Geographies of the Muslim World)

GEOG 4742	Topics in Environment and Society (Contemporary Islam: Empire/Terror/Revolution)
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution
JWST 2350	Introduction to Jewish Culture
HEBR/JWST 4203	Israeli Literature: Exile, Nation, Home
HIST 3328	Seminar in Middle Eastern History
HIST 4328	The Modern Middle East, 1600 to the Present
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST/JWST 4338	History of Modern Israel/Palestine
HIST/JWST 4348	Topics in Jewish History (Tel Aviv Urban History and Culture)
HIST/JWST 4378	History of Modern Jewish-Muslim Relations
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
HUMN 3850	The Mediterranean Religion Before Modernity
IAFS 3000	Special Topics in International Affairs (Arab / Israel Conflict)
IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East)
IAFS 3000	Special Topics in International Affairs (Security in the Middle East)
IAFS 3000	Special Topics in International Affairs (Statebuilding in the 21st Century)
IAFS 3000	Special Topics in International Affairs (Turkey-Mediator/Arab Spring)
IAFS 3000	Special Topics in International Affairs (Gender, Geopolitics and Islam)
IAFS 4500	The Post-Cold War World (Afghanistan and Iraq)
IAFS 4500	The Post-Cold War World (Understanding 9/11: Causes, Events, Legacies)
IAFS 4500	The Post-Cold War World (The Geopolitics and Economics of Oil)
JWST/IAFS/RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
RLST 2202	Islam
RLST 2600	Judaism, Christianity, and Islam
RLST 3040	The Quran
RLST 3060	Fundamentalism and Islam
RLST 3070	Sufism
RLST 4820/5820	Interdisciplinary Seminar on Religion: Topics
SOCY 4131	Advanced Topics in Sociology (Gender, Islam, and Modernity)

Students should consult with the MEIS certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) annually and must fulfill the requirements for an undergraduate degree at CU Boulder.

South Asian Languages and Civilizations - Certificate

The Certificate in South Asian Languages and Civilizations is designed to help prepare CU students for careers with international companies and government agencies that are searching for employees with language skills in Hindi/Urdu and a broad understanding of South Asia.

South Asia—comprising India, Pakistan, Sri Lanka, Bangladesh, Nepal and Tibet—has emerged as a key center of economic, political and cultural power in the 21st century. South Asia in ancient times drove the economy of Central and Southeast Asia, exported a cosmopolitan Sanskrit literary culture and was the spiritual home of Hinduism and Buddhism. South Asia in medieval times was a major hub of global trade and the pride of a wide-ranging Persianate civilization. Its Mughal Empire was far more populous and wealthy than the Ottomans and Safavids combined. South Asia today is home to over 100 officially recognized languages and most of the world's major religious traditions. With some 500 million speakers, Hindi/Urdu is one of the most popular languages in the world, alongside Mandarin, English and Spanish. Hindi-Urdu boasts thriving contemporary literary and media cultures, and—with Bollywood—the world's largest and most influential film industry.

Students currently pursuing the requirements of the Certificate in South Asian Languages and Civilizations (SALC) or interested in doing so should complete the Statement of Intent form (<https://www.colorado.edu/alc/undergraduate/certificates>) available on the department website. Students who have completed the requirements for the SALC certificate and are graduating in December or May must complete the Program of Study form (<https://www.colorado.edu/alc/undergraduate/certificates>) and the Certificate Completion form (<https://www.colorado.edu/alc/undergraduate/certificates>), also available on the department website, and submit them to the SALC certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) two months prior to graduation.

Students cannot declare both the Certificate in South Asian Languages and Civilizations and the Minor in Hindi/Urdu.

Requirements

The certificate requires a total of 19 credit hours, which include both language and content courses.

Required Courses: At least one year of Hindi/Urdu language courses beginning at the intermediate level (2000 level) with a grade of C or better. A student who participates in an approved study abroad program may earn up to 10 credit hours for language study at an intermediate or advanced level.

Electives: Three courses, at least one of which must be a course designated HIND. These nine credit hours may be selected from the list of approved content courses below and are to be completed with a grade of C- or better. Approval of study abroad credits for content courses will be reviewed on a case-by-case basis.

Possible Electives Include:

ANTH 4180	Anthropological Perspectives: Contemporary Issues (The Himalayas)
ANTH 4750	Culture and Society in South Asia
ANTH 4690	Anthropology of Tibet
HIND 3441	Screening India: A History of Bollywood Cinema

HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination
HIND 3661	South Asian Diasporas: Imagining Home Abroad
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture
HIND 3851	Devotional Literature in South Asia
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST 4339	Borderlands of the British Empire
HIST 4349	Decolonization of the British Empire
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
HIST 4538	History of Modern India
HIST 4548	Women in Modern India
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
HIST 4820	Human Rights: Historical Perspectives
IAFS 4500	The Post-Cold War World (South Asia)
IAFS 4500	The Post-Cold War World (South Asia/Conflict/Resolution)
IAFS 4500	The Post-Cold War World (Conflict/Culture in South Asia)
RLST 2610	Religions of India
RLST 2612	Yoga: Ancient and Modern
RLST 3070	Sufism
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3550	Tibetan Buddhism
RLST 3820	Topics in Religious Studies (Tibetan Buddhism)
RLST 4200	Topics in Hinduism
RLST 4250	Topics in Buddhism
RLST 4280	Body and Magic in India
RLST 5210	Advanced Readings in Sanskrit

Students should consult with the SALC certificate advisor (<https://www.colorado.edu/alc/undergraduate/advising>) annually and must fulfill the requirements for an undergraduate degree at CU Boulder.

Asian Studies

The Center for Asian Studies offers a broad interdisciplinary undergraduate major in Asian Studies (including optional tracks for students wishing to focus on one of three specific areas: Middle East/West Asia, Korea, and South Asia) and a minor.

Students planning to major in Asian Studies may obtain credit when they participate in study abroad programs in Asia with prior approval from the Asian Studies Program and the Office of International Education.

For additional information on the major program, see the Bachelor's Degree in Asian Studies or contact Colleen Berry at colleen.berry@colorado.edu or 303-735-5224.

Course code for this program is ASIA.

Bachelor's Degree

- Asian Studies - Bachelor of Arts (BA) (p. 197)
 - Middle East/West Asia track (optional)
 - Korea track (optional)
 - South Asia track (optional)

Minor

- Asian Studies - Minor (p. 204)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berry, J. Colleen (https://experts.colorado.edu/display/fisid_155491)
Instructor; PhD, Indiana University Bloomington

Jones, Carla Mae (https://experts.colorado.edu/display/fisid_134172)
PhD, University of North Carolina Chapel Hill

Oakes, Timothy S. (https://experts.colorado.edu/display/fisid_109269)
PhD, University of Washington

ASIA 2000 (3) Gateway to Modern Asia: Exploring Regional Connections
Introduces main themes, intellectual approaches used in Asian Studies through a transdisciplinary perspective that focuses on interactions and links between geographic regions and national boundaries. Presents Asia as a concept, a powerful imaginary geography, and historically dynamic construct that has shaped / been shaped by global patterns of economic development, nation building, war and diplomacy, colonialism and aspirations for better lives.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asia Content

ASIA 2852 (3) Contemporary Southeast Asia: Environmental Politics
Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 2852

Grading Basis: Letter Grade

ASIA 3300 (3) Sex and Gender in Asian Film and Literature

Explores issues of sex and gender in traditional and contemporary Asian cultures by looking at how sex and gendered roles are configured and play out in Asian cultures. Employs film and literary sources which reflect, subvert and act as agents of change in the dominant cultures.

Additional Information: Departmental Category: Asia Content

ASIA 3900 (3) Discovering Urban China: Tradition, Modernity, Nostalgia

Explores the ways Chinese cities, especially Beijing and Shanghai, are depicted in scholarly articles, films, literature and population culture in terms of tradition, modernity and nostalgia. Begins by defining the terms then discusses texts dealing with these themes. Discussions are linked to what the students observe first-hand as they explore the cities. Takes place in China.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

ASIA 4300 (3) Open Topics in Asian Literature and Culture

Examines selected texts on a particular topic. Taught by regular or visiting faculty. Topics change each term.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Asia Content

ASIA 4830 (3) Capstone Seminar in Asian Studies

Participates in a discussion seminar on topics in Asian Studies, conducts research and writes a thesis or creates a project on an approved Asian topic, following guidelines established by the program director. Required for an Asian Studies major.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Asian Studies (ASIA) majors only.

Additional Information: Departmental Category: Asia Content

ASIA 4840 (1-3) Independent Study

Provides an independent study opportunity, by special arrangement with Asian Studies faculty, for students with particular Asian Studies interests.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Asian Studies (ASIA) majors only.

Additional Information: Departmental Category: Asia Content

ASIA 4930 (1-6) Engage Asia: Internship in Asian Studies

Matches students with supervised internships relevant to academic topics in Asian studies. Students work with CAS faculty and internship supervisors, i.e., intern with companies or non-profits doing Asia-related business or project.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Requisite Asian language and culture courses.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

Asian Studies - Bachelor of Arts (BA)

The study of Asia is highly relevant and important in this global age. Its influences on the Western world can be seen in economics, politics, music, the arts, entertainment and religion.

The Asian Studies major at CU Boulder encompasses a diverse interdisciplinary study of Asia and gives students an opportunity to discover Asia through a wide variety of courses that reflect the astonishing diversity of the region. Many students choose Asian Studies as a second major to complement the study of such subjects as: history, international affairs, or geography. As part of your Asian Studies major requirements, you will receive a thorough grounding in the history of Asia and you will study an Asian language: Arabic, Chinese, Hindi, Farsi, Japanese, Korean, Sanskrit or Tibetan. All majors will complete their Asian Studies degree with the Senior Thesis or Project in Asian Studies, an in-depth exploration of broad issues that relate to a sub-region within Asia or the region as a whole.

Upon completion of this course of study, you will have received a highly individualized and broad education in the Asian region that will allow you to better understand its history and culture as well as its current dynamics.

NOTE: Students have several options when majoring in Asian Studies. One is the general Asian Studies Bachelor of Arts degree. However, if a student wishes to choose a particular area of emphasis that will appear on their transcript, there are three options below.

Optional Specific Areas Tracks

Korea Track

An option for students who want to make Korea their area of emphasis and who would like to see it shown on their transcripts.

South Asia Track

An option for students who want South Asia to be their focus and who would like to see it shown on their transcripts.

West Asia/Middle East Track

An option for students who want to focus on West Asia/Middle East and who would like to see it shown on their transcripts.

Contact Information

Please contact Faculty Advisor Colleen Berry at colleen.berry@colorado.edu. Her office is located in Room 202 in the Center for Asian Studies building at 1424 Broadway (two doors north of Starbucks on University and Broadway).

Contact the Undergraduate Advisor Allison Frey at Allison.Frey@Colorado.edu. To change your major to Asian Studies, please schedule an appointment through advising.colorado.edu (<http://advising.colorado.edu>)'s appointment system.

General Degree Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and Sciences minimum). Other courses not listed here including some study abroad courses and special topics courses may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Required Courses

ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
ASIA 4830	Capstone Seminar in Asian Studies	3

Asian Language

4 semesters of a single Asian language: 12-20

Arabic (sequence of three years offered)

Chinese (sequence of four years offered)

Farsi (sequence of four years offered)

Hindi (sequence of three years offered)

Japanese (sequence of four years offered)

Korean (sequence of three years offered)

Sanskrit and Tibetan are also available through Continuing Education

Traditional Asian Civilizations

Students take any two introductory courses, focusing on two different civilizations (East Asia, South Asia, West Asia); 6 credit hours minimum, lower division (see Traditional Asian Civilizations below) 6

Modern Asian Civilizations

Students take one course; 3 credit hours, lower division or upper division (see Modern Asian Civilizations below) 3

Electives

Students take at least three courses; 9 credit hours, lower division or upper division (see Electives below) 9

Total Credit Hours 36-44

Traditional Asian Civilizations

Students take any two of the following introductory courses, focusing on two different civilizations (East Asia, South Asia, West Asia); 6 credit hours minimum, lower-division.

East Asian Civilization

CHIN 1012	Introduction to Chinese Civilization
HIST 1618	Introduction to Chinese History to 1644
HIST 1708	Introduction to Japanese History
JPNS 1012	Introduction to Japanese Civilization
HIST 1438	Introduction to Korean History
KREN 1011	Introduction to Korean Civilization
RLST 2620	Religions of East Asia

South Asian Civilization

HIND 1011	Introduction to South Asian Civilizations
HIST 1518	Introduction to South Asian History to 1757
RLST 2610	Religions of India

West Asian Civilization

ANTH 1135	Exploring Cultural Diversity (Mesopotamia 2nd Millennium BC)
ARAB 1011	Introduction to Arab and Islamic Civilizations
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature
FRSI 1011	Introduction to Persian Civilization
HIST 1308	Introduction to Middle Eastern History
RLST 2202	Islam
RLST 2320	The Muslim World, 600-1250

Modern Asian Civilizations

Students take one course; 3 credit hours, lower-division or upper-division.

ANTH (all modern Asian anthropology courses)

ANTH 1100	Exploring a Non-Western Culture: The Tamils
ANTH 1105	Exploring a Non-Western Culture: Tibet
ANTH 1135	Exploring Cultural Diversity (Japan; Papua New Guinea)
ANTH 4020	Explorations in Anthropology (Ethnography of Southeast Asia; Global Islams)
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Nepal and the Himalayas)
ANTH 4505	Globalization and Transnational Culture
ANTH 4690	Anthropology of Tibet
ANTH 4750	Culture and Society in South Asia
ANTH 4760	Ethnography of Southeast Asia and Indonesia

ARTH

ARTH 4919	Capstone Seminar: Topics in Art History (Contemporary Asian Art; China!; Contemporary Art in the Middle East; Contemporary Art of the Himalayas)
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ASIA

ASIA 3300	Sex and Gender in Asian Film and Literature
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ASIA 3900	Discovering Urban China: Tradition, Modernity, Nostalgia
ASIA 4300	Open Topics in Asian Literature and Culture (Depending on topic)
ASIA 4840	Independent Study (Depending on topic)
ECON	
ECON 4534	Chinese Economic History in Comparative Perspective
ENGL	
ENGL 4018	Global, Transnational and Postcolonial Approaches to Post-1600 Literature (Israel/Palestine)
ENGL 4287	Special Topics in LGBT Literature (Multicultural and Postcolonial Literature: Post-Orientalism)
GEOG (all modern Asian geography courses)	
GEOG 3822	Geography of China
GEOG 3832	Geographies of South Asia
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution
GEOG 4822	Environment and Development in China
GEOG 4832	Geography of Tibet
HIST (all modern Asian history courses)	
HIST 1528	Introduction to South Asian History since 1757
HIST 1628	Introduction to Chinese History since 1644
HIST 2110	History of Early Modern Societies (Early Modern China 960-1842)
HIST 2166	The Vietnam Wars
HIST 3628	Seminar in Recent Chinese History
HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan)
HIST 4109	World War II in Asia and the Pacific
HIST 4166	The Vietnam War in Politics and Culture
HIST 4328	The Modern Middle East, 1600 to the Present
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST 4338	History of Modern Israel/Palestine
HIST 4538	History of Modern India
HIST 4548	Women in Modern India
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
HIST 4618	Early Modern China, 960-1842
HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
HIST 4648	Inventing Chinese Modernity, 1800 to Present
HIST 4658	China and Islam from the 7th Century to the 20th Century
HIST 4688	Window on Modern China
HIST 4728	Modern Japanese History
HIST 4738	History of Early Modern Japan (1590-1868)
HIST 4758	The History of Postwar Japan, 1945 to Present
HIST 4109	World War II in Asia and the Pacific
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001

HUMN

HUMN 3341	Literature and Popular Culture in Modern China
HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation

IAFS

IAFS 4500	The Post-Cold War World (Contemporary China - International Views; Cultural Revolution - China 1966-79; China in the Global Economy; Afghanistan and Iraq; South Asia-Conflict/Resolution)
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JWST

JWST 4338	History of Modern Israel/Palestine
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MDST

MDST 4211	Asian Media and Culture
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PSCI (all modern Asian politics courses)

PSCI 3072	Government and Politics in Southeast Asia
PSCI 3102	South Asian Politics
PSCI 4022	Chinese Foreign Policy
PSCI 4052	Chinese Politics
PSCI 4242	Middle Eastern Politics

RLST (all modern Asian religion courses)

RLST 3820	Topics in Religious Studies (Religion in Modern China)
RLST 4250	Topics in Buddhism
RLST 4650	Islam in the Modern World

WGST (all Asian Women's Studies courses)

WGST 3220	Women in Islam
WGST 3410	Gender, Sexuality and Culture in the Modern Middle East

All modern Asian literature courses

ARAB 3230	Islamic Culture and the Iberian Peninsula
ARAB 3330	The Arabic Novel
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
ARAB 4250	Arabic Media
CHIN 2441	Film and the Dynamics of Chinese Culture
CHIN 3331	Culture and Literature of Late Imperial China
CHIN 3341	Literature and Popular Culture in Modern China
CHIN 3342	Literary Culture in Contemporary China
CHIN 3371	Topics in Chinese Film
FILM 2513	Major Asian Filmmakers
FILM 4023	Topics in International Cinema (Contemporary Asian Cinema)
HIND 3441	Screening India: A History of Bollywood Cinema
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination
HIND 3661	South Asian Diasporas: Imagining Home Abroad
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
JPNS 2441	Japanese Culture through Film and Anime
JPNS 3331	Business Japanese

JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl
JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation
JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation
JPNS 3851	Studies in Japanese Popular Culture
JPNS 4050	Japanese Sociolinguistics: Japanese Language and Society
JPNS 4210	Contemporary Japanese 1: Current Issues
KREN 2441	Film and Korean Culture
KREN 3841	Modern Korean Literature in English Translation

Electives

Students take at least three courses; 9 credit hours, lower-division or upper-division. After meeting the requirements for Traditional Asian Civilization and Modern Asian Civilization classes (listed above), additional classes in those categories may also be taken as Electives.

ANTH 1100	Exploring a Non-Western Culture: The Tamils
ANTH 1105	Exploring a Non-Western Culture: Tibet
ANTH 1135	Exploring Cultural Diversity (Japan; Mesopotamia –2nd Millennium BC; Papua New Guinea)
ANTH 4020	Explorations in Anthropology (Ethnography of Southeast Asia; Global Islams)
ANTH 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Theory in Cultural Anthropology—Nepal and the Himalayas)
ANTH 4505	Globalization and Transnational Culture
ANTH 4690	Anthropology of Tibet
ANTH 4750	Culture and Society in South Asia
ANTH 4760	Ethnography of Southeast Asia and Indonesia
ARAB 1011	Introduction to Arab and Islamic Civilizations
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature
ARAB 2320	The Muslim World, 600-1250
ARAB 3230	Islamic Culture and the Iberian Peninsula
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit
ARAB 3241	Art in Islamic Cultures
ARAB 3330	The Arabic Novel
ARAB 3340	Representing Islam
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
ARAB 4200	Advanced Readings in Arabic
ARAB 4250	Arabic Media
ARAB 4840	Independent Study
ARTH 2409	Intro to Asian Art
ARTH 3619	The Arts of China
ARTH 3629	The Arts of Japan
ARTH 3929	Special Topics in Art History (Asian Art—Gods, Kings and Power; Art in Asian Religions)

ARTH 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)	GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution
ARTH 4269	Art and Archaeology of the Ancient Near East	GEOG 4822	Environment and Development in China
ARTH 4919	Capstone Seminar: Topics in Art History (Contemporary Asian Art; China!; Contemporary Art in the Middle East; Contemporary Art of the Himalayas)	GEOG 4832	Geography of Tibet
ARTH 4929	Special Topics in Art History (Art of Buddhism; Art of the Himalayas/Tibet; Politics/Propaganda Asian Art)	HIND 3400	Special Topics
ASIA 4300	Open Topics in Asian Literature and Culture	HIND 3441	Screening India: A History of Bollywood Cinema
ASIA 4840	Independent Study	HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination
ASIA 4930	Engage Asia: Internship in Asian Studies	HIND 3661	South Asian Diasporas: Imagining Home Abroad
CHIN 1051	Masterpieces of Chinese Literature in Translation	HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
CHIN 2441	Film and the Dynamics of Chinese Culture	HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	HIND 3851	Devotional Literature in South Asia
CHIN 3311	The Dao and the World in Medieval China	HIST 1308	Introduction to Middle Eastern History
CHIN 3321	Culture and Literature of Ancient China	HIST 1438	Introduction to Korean History
CHIN 3331	Culture and Literature of Late Imperial China	HIST 1518	Introduction to South Asian History to 1757
CHIN 3334	Chinese Narrative Tradition	HIST 1528	Introduction to South Asian History since 1757
CHIN 3341	Literature and Popular Culture in Modern China	HIST 1618	Introduction to Chinese History to 1644
CHIN 3342	Literary Culture in Contemporary China	HIST 1628	Introduction to Chinese History since 1644
CHIN 3351	Reality and Dream in Traditional Chinese Literature	HIST 1708	Introduction to Japanese History
CHIN 3361	Women and the Supernatural in Chinese Literature	HIST 1800	Introduction to Global History (Maritime Asia 1500-1800)
CHIN 3371	Topics in Chinese Film	HIST 1818	Introduction to Jewish History: Bible to 1492
CHIN 4210	Introduction to Classical Chinese	HIST 2110	History of Early Modern Societies (Early Modern China 960-1842)
CHIN 4220	Readings in Classical Chinese	HIST 2166	The Vietnam Wars
CHIN 4300	Open Topics: Readings in Chinese Literature	HIST 2220	History of War and Society (Warfare and Culture in South Asia; Militarism in Japanese History; Korea through Wars)
CHIN 4750	Daoism	HIST 2629	China in World History
CHIN 4900	Independent Study	HIST 3109	Seminar in Asian History
CHIN 4980	Practical Issues in Chinese Language Pedagogy	HIST 3328	Seminar in Middle Eastern History
CLAS 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)	HIST 3628	Seminar in Recent Chinese History
CLAS 4269	Art and Archaeology of the Ancient Near East	HIST 3718	Seminar in Japanese History
ECON 4534	Chinese Economic History in Comparative Perspective	HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan)
EDUC 4800	Special Topics (Asia)	HIST 4109	World War II in Asia and the Pacific
EMUS 1467	World Music Ensemble (Japanese; Gamelan)	HIST 4166	The Vietnam War in Politics and Culture
EMUS 3467	World Music Ensemble (Japanese; Gamelan)	HIST 4328	The Modern Middle East, 1600 to the Present
ENGL 4018	Global, Transnational and Postcolonial Approaches to Post-1600 Literature (Israel/ Palestine)	HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
ENGL 4287	Special Topics in LGBT Literature (Multicultural and Postcolonial Literature: Post-Orientalism)	HIST 4338	History of Modern Israel/Palestine
ETHN 3105	Selected Topics in Asian American Studies (Bruce Lee and Transpacific)	HIST 4339	Borderlands of the British Empire
FILM 2513	Major Asian Filmmakers	HIST 4348	Topics in Jewish History (Tel Aviv—Urban History and Culture)
FILM 4023	Topics in International Cinema (Contemporary Asian Cinema)	HIST 4349	Decolonization of the British Empire
GEOG 3822	Geography of China	HIST 4378	History of Modern Jewish-Muslim Relations
GEOG 3832	Geographies of South Asia	HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
GEOG 4742	Topics in Environment and Society (Depending on topic)	HIST 4538	History of Modern India
		HIST 4548	Women in Modern India
		HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
		HIST 4618	Early Modern China, 960-1842

HIST 4619	Women in East Asian History	JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation
HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949	JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation
HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present	JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation
HIST 4648	Inventing Chinese Modernity, 1800 to Present	JPNS 3851	Studies in Japanese Popular Culture
HIST 4658	China and Islam from the 7th Century to the 20th Century	JPNS 3861	Imagining the Samurai in Japanese Literature and Culture
HIST 4688	Window on Modern China	JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture
HIST 4718	Ancient, Classical, and Medieval Japanese History	JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture
HIST 4728	Modern Japanese History	JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture
HIST 4738	History of Early Modern Japan (1590-1868)	JPNS 4050	Japanese Sociolinguistics: Japanese Language and Society
HIST 4758	The History of Postwar Japan, 1945 to Present	JPNS 4070	Second Language Acquisition of Japanese
HIST 4808	Special Topics in World Areas History (Chinese and Japanese Modernity)	JPNS 4080	Kanji in Japanese Orthography
HUEN 3750	Xi'an, China: Self-Awareness and Images of the Other	JPNS 4150	Japanese to English Translation: Theory and Practice
HUEN 3843	Special Topics (China through the Eyes of the West)	JPNS 4210	Contemporary Japanese 1: Current Issues
HUMN 3093	Topics in Humanities (Representing Islam; The Arabic Novel; Narrating the City)	JPNS 4300	Open Topics: Readings in Japanese
HUMN 3321	Culture and Literature of Ancient China	JPNS 4310	Classical Japanese 1
HUMN 3341	Literature and Popular Culture in Modern China	JPNS 4320	Classical Japanese 2
HUMN 3811	Love, Death, and Desire: Classical Japanese Literature in Translation	JPNS 4400	Critical Theory and Japanese Literature and Culture
HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation	JPNS 4900	Independent Study
HUMN 4100	Writing the World in Traditional China	JPNS 4980	Practical Issues in Japanese Language Pedagogy
IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East; Turkey—Mediator/Arab Spring; Gender, Geopolitics and Islam)	KREN 2441	Film and Korean Culture
IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel	KREN 3841	Modern Korean Literature in English Translation
IAFS 3650	History of Arab-Israeli Conflict	KREN 4900	Independent Study
IAFS 4500	The Post-Cold War World (Contemporary China/ International Views; Cultural Revolution/ China 1966-79; China in the Global Economy; Afghanistan and Iraq; South Asia/Conflict/ Resolution; Arab Awakening)	JWST 1818	Introduction to Jewish History: Bible to 1492
INBU 3300	International Business and Management	JWST 2600	Judaism, Christianity, and Islam
INBU 3301	Doing Business in China	JWST 3100	Judaism
INBU 4151	International Operations in Hong Kong	JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
INBU 4200	International Financial Management	JWST 3650	History of Arab-Israeli Conflict
JPNS 1051	Masterpieces of Japanese Literature in Translation	JWST 4050	Anthropology of Jews and Judaism
JPNS 2441	Japanese Culture through Film and Anime	JWST 3650	History of Arab-Israeli Conflict
JPNS 2811	Heroes and the Supernatural: Word and Image in Old Japan	JWST 4050	Anthropology of Jews and Judaism
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
JPNS 3331	Business Japanese	JWST 4338	History of Modern Israel/Palestine
JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl	JWST 4378	History of Modern Jewish-Muslim Relations
JPNS 3811	Love, Death, and Desire: Classical Japanese Literature in Translation	MDST 4211	Asian Media and Culture
		MDST 4341	International Media and Global Crises
		MUEL 2772	World Musics: Asia and Oceania
		MUSC 2772	World Musics: Asia and Oceania
		MUSC 4152	East Asian Music
		PHIL 1600	Philosophy and Religion
		PHIL 3800	Open Topics in Philosophy (Buddhism as Philosophy)
		PSCI 3072	Government and Politics in Southeast Asia

PSCI 3102	South Asian Politics
PSCI 4022	Chinese Foreign Policy
PSCI 4028	Special Topics (Politics of Southeast Asia)
PSCI 4028	Special Topics (Middle East Politics)
PSCI 4052	Chinese Politics
PSCI 4242	Middle Eastern Politics
RLST 2202	Islam
RLST 2320	The Muslim World, 600-1250
RLST 2600	Judaism, Christianity, and Islam
RLST 2610	Religions of India
RLST 2612	Yoga: Ancient and Modern
RLST 2620	Religions of East Asia
RLST 3040	The Quran
RLST 3060	Fundamentalism and Islam
RLST 3100	Judaism
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
RLST 3750	Women in Buddhism
RLST 3800	Chinese Religions
RLST 3820	Topics in Religious Studies (Religion in Modern China; Buddhist Art and Ritual; Buddhist Literature in Tibet; Islam, Politics and Militancy; The Story of the Quran; Art in Asian Religions; The Mystical Path of Islam/Sufism)
RLST 4200	Topics in Hinduism
RLST 4250	Topics in Buddhism (Buddhist Literature in Tibet; Transnational Buddhism; Buddhist Ethics; Buddhist Ethics; Buddhist Philosophy; Buddhism and Society; Buddhist Esotericism)
RLST 4260	Topics in Judaism (Bible in Judaism/Christianity)
RLST 4650	Islam in the Modern World
RLST 4750	Daoism
WGST 2600	Gender, Race, and Class in a Global Context
WGST 3012	Women and Development
WGST 3220	Women in Islam
WGST 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST 3500	Global Gender Issues
WGST 3750	Women in Buddhism
WGST 4619	Women in East Asian History

Bachelor's Degree in Asian Studies--Korea Track

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and Sciences minimum). Other courses not listed here including some study abroad courses and special topics courses may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Required Courses

ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
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ASIA 4830	Capstone Seminar in Asian Studies (The Senior Thesis/Project should focus on a Korean topic.)	3
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Asian Language

4 semesters of Korean language (20 credit hours). Additional 12-20 semesters can count as Asian Studies Electives.

Traditional Asian Civilizations

Students take two introductory courses, one on Korea and one on South or West Asia; 6 credits minimum, lower division. 6

Korean Civilization

HIST 1438 Introduction to Korean History

KREN 1011 Introduction to Korean Civilization

West or South Asian Civilization

West Asian Civilization

ANTH 1135 Exploring Cultural Diversity

ARAB 1011 Introduction to Arab and Islamic Civilizations

ARAB 2231 Love, Loss and Longing in Classical Arabic Literature

FRSI 1011 Introduction to Persian Civilization

HIST 1308 Introduction to Middle Eastern History

RLST 2202 Islam

South Asian Civilization

HIND 1011 Introduction to South Asian Civilizations

HIST 1518 Introduction to South Asian History to 1757

RLST 2610 Religions of India

Modern Asian Civilizations

Students take one course; 3 credit hours, lower division or upper division. 3

Electives

Students take at least three additional courses (9 credit hours), two of which (6 credit hours) focus on Korea, lower division or upper division. 9

Courses with a Korean focus

All KREN courses

HIST 1438 Introduction to Korean History

HIST 2220 History of War and Society (Korea through Wars)

Total Credit Hours 36-44

Bachelor's Degree in Asian Studies--South Asia Track

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and Sciences minimum). Other courses not listed here including some study abroad courses and special topics courses may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Required Courses

ASIA 2000 Gateway to Modern Asia: Exploring Regional Connections

ASIA 4830 Capstone Seminar in Asian Studies (The Senior Thesis/Project should focus on a South Asian topic.)

Asian Language

4 semesters of a single South Asian language (12-20 credit hours). Additional semesters can count as Asian Studies Electives. 12-20

Hindi (sequence of three years offered)	
Sanskrit and Tibetan are also available through Continuing Education	
<i>Traditional Asian Civilizations</i>	
Students take two introductory courses, one on South Asia and one on West or East Asia; 6 credits minimum, lower division.	6
South Asian Civilization	
HIND 1011	Introduction to South Asian Civilizations
HIST 1518	Introduction to South Asian History to 1757
RLST 2610	Religions of India
East or West Asian Civilization	
West Asian Civilization	
ANTH 1135	Exploring Cultural Diversity
ARAB 1011	Introduction to Arab and Islamic Civilizations
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature
FRSI 1011	Introduction to Persian Civilization
HIST 1308	Introduction to Middle Eastern History
RLST 2202	Islam
East Asian Civilization	
CHIN 1012	Introduction to Chinese Civilization
HIST 1438	Introduction to Korean History
HIST 1618	Introduction to Chinese History to 1644
HIST 1708	Introduction to Japanese History
JPNS 1012	Introduction to Japanese Civilization
KREN 1011	Introduction to Korean Civilization
RLST 2620	Religions of East Asia
<i>Modern Asian Civilizations</i>	
Students take one course; 3 credit hours, lower division or upper division.	3
<i>Electives</i>	
Students take at least three additional courses (9 credit hours), two of which (6 credit hours) focus on West Asia, lower division or upper division.	9
Courses with a South Asian Focus	
All HIND, SNSK and TBTN courses	
ANTH 1105	Exploring a Non-Western Culture: Tibet
ANTH 4690	Anthropology of Tibet
ANTH 4750	Culture and Society in South Asia
GEOG 3832	Geographies of South Asia
GEOG 4832	Geography of Tibet
HIST 1518	Introduction to South Asian History to 1757
HIST 1528	Introduction to South Asian History since 1757
HIST 4339	Borderlands of the British Empire
HIST 4349	Decolonization of the British Empire
HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
HIST 4538	History of Modern India
HIST 4548	Women in Modern India
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
IAFS 4500	The Post-Cold War World (South Asia)
PSCI 3102	South Asian Politics
RLST 2610	Religions of India

RLST 2612	Yoga: Ancient and Modern
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3820	Topics in Religious Studies (Tibetan Buddhism)
RLST 4200	Topics in Hinduism
WGST 3750	Women in Buddhism
Total Credit Hours	30-38

Bachelor's Degree in Asian Studies--West Asia/Middle East Track

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below: 42 credit hours minimum, 18 of which must be upper-division (College of Arts and Sciences minimum). Other courses not listed here including some study abroad courses and special topics courses may be applicable toward the Asian Studies major, but must first be approved by the Asian Studies Faculty Advisor.

Required Courses

ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections
ASIA 4830	Capstone Seminar in Asian Studies (The Senior Thesis/Project should focus on a West Asian topic.)

Asian Language

4 semesters of a single West Asian language (14-20 credit hours). 12-20 Additional semesters can count as Asian Studies Electives.

Arabic (sequence of three years offered)	
Farsi (sequence of three years offered)	

Traditional Asian Civilizations

Students take two introductory courses, one on West Asia and one on South or East Asia; 6 credits minimum, lower division.

West Asian Civilization	
ANTH 1135	Exploring Cultural Diversity
ARAB 1011	Introduction to Arab and Islamic Civilizations
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature
FRSI 1011	Introduction to Persian Civilization
HIST 1308	Introduction to Middle Eastern History
RLST 2202	Islam
East or South Asian Civilization	
East Asian Civilization	
CHIN 1012	Introduction to Chinese Civilization
HIST 1438	Introduction to Korean History
HIST 1618	Introduction to Chinese History to 1644
HIST 1708	Introduction to Japanese History
JPNS 1012	Introduction to Japanese Civilization
KREN 1011	Introduction to Korean Civilization
RLST 2620	Religions of East Asia
South Asian Civilization	
HIND 1011	Introduction to South Asian Civilizations
HIST 1518	Introduction to South Asian History to 1757
RLST 2610	Religions of India
<i>Modern Asian Civilizations</i>	

Students take one course; 3 credit hours, lower division or upper division.

Electives

Students take at least three additional courses (9 credit hours), two of which (6 credit hours) focus on West Asia, lower division or upper division.

Courses with a West Asian Focus

All ARAB and FRSI courses		
ANTH 1135	Exploring Cultural Diversity (Mesopotamia-2nd Millennium BC)	3
ANTH 4020	Explorations in Anthropology (Global Islams)	
ARTH 4269	Art and Archaeology of the Ancient Near East	
GEOG 4742	Topics in Environment and Society (Geographies of Contemporary Muslim Societies: Islam, Biopolitics, and the Postcolonial)	
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	
HIST 1308	Introduction to Middle Eastern History	
HIST 1818	Introduction to Jewish History: Bible to 1492	
HIST 3328	Seminar in Middle Eastern History	
HIST 4328	The Modern Middle East, 1600 to the Present	
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001	
HIST 4338	History of Modern Israel/Palestine	
JWST 4338	History of Modern Israel/Palestine	
HIST 4378	History of Modern Jewish-Muslim Relations	
JWST 4378	History of Modern Jewish-Muslim Relations	
HUMN 3850	The Mediterranean Religion Before Modernity	
IAFS 3650	History of Arab-Israeli Conflict	
JWST 3650	History of Arab-Israeli Conflict	
IAFS 4500	The Post-Cold War World (Afghanistan and Iraq)	
JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	
IAFS 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	
RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	
JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel	
PSCI 4242	Middle Eastern Politics	
RLST 2202	Islam	
RLST 2600	Judaism, Christianity, and Islam	
RLST 3100	Judaism	
RLST 3600		
Total Credit Hours		30-38

Asian Studies - Minor

The minor in Asian studies allows students to engage in interdisciplinary study of Asia, adding an important global focus to their primary studies. While the minor does not grant credit for foreign language, students are encouraged to study abroad, and are able to gain a strong foundation in knowledge of the Asian world through a vast array of fascinating coursework. The Asian studies academic advisor and faculty advisor

strongly encourage thematic or regional concentration, and are available for help in customizing the minor.

For any questions, please email Dr. Colleen Berry (colleen.berry@colorado.edu) or call (303) 735-5224. Visit the Asian studies minor (<http://www.colorado.edu/cas/academics/asian-studies-minor>) webpage for additional information.

Required Courses and Credit Hours

Students must take a minimum of 21 credit hours, 12 of which must be upper-division (usually four 3-credit-hour courses). Up to, but no more than, 9 credit hours earned through study abroad can be counted toward the minor.

Required Courses

ASIA 2000	Gateway to Modern Asia: Exploring Regional Connections	3
Traditional Asian Civilizations: two courses (two different civilizations; see list below)		6
Modern Asian Civilizations: one course (see list below)		3
Electives		
The remaining credits are fulfilled through a variety of available electives (see list below)		9
Total Credit Hours		21

Traditional Asian Civilizations

Students take two of the following introductory courses, choosing one from each of two different civilizations (East Asia, South Asia, West Asia); 6 credit hours minimum, lower-division.

East Asian Civilization

CHIN 1012	Introduction to Chinese Civilization
HIST 1618	Introduction to Chinese History to 1644
HIST 1708	Introduction to Japanese History
JPNS 1012	Introduction to Japanese Civilization
HIST 1438	Introduction to Korean History
KREN 1011	Introduction to Korean Civilization
RLST 2620	Religions of East Asia

South Asian Civilization

HIND 1011	Introduction to South Asian Civilizations
HIST 1518	Introduction to South Asian History to 1757
RLST 2610	Religions of India

West Asian Civilization

ANTH 1135	Exploring Cultural Diversity (Mesopotamia 2nd Millennium BC)
ARAB 1011	Introduction to Arab and Islamic Civilizations
ARAB 2231	Love, Loss and Longing in Classical Arabic Literature
FRSI 1011	Introduction to Persian Civilization
HIST 1308	Introduction to Middle Eastern History
RLST 2202	Islam
RLST 2320	The Muslim World, 600-1250

Modern Asian Civilizations

Students take one course; 3 credit hours, lower-division or upper-division.

ANTH (all modern Asian anthropology courses)

ANTH 1100	Exploring a Non-Western Culture: The Tamils
ANTH 1105	Exploring a Non-Western Culture: Tibet
ANTH 1135	Exploring Cultural Diversity (Japan; Papua New Guinea)
ANTH 4020	Explorations in Anthropology (Ethnography of Southeast Asia; Global Islams)
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Nepal and the Himalayas)
ANTH 4505	Globalization and Transnational Culture
ANTH 4690	Anthropology of Tibet
ANTH 4750	Culture and Society in South Asia
ANTH 4760	Ethnography of Southeast Asia and Indonesia

ARTH

ARTH 4919	Capstone Seminar: Topics in Art History (Contemporary Asian Art; China!; Contemporary Art in the Middle East; Contemporary Art of the Himalayas)
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ASIA

ASIA 3300	Sex and Gender in Asian Film and Literature
ASIA 3900	Discovering Urban China: Tradition, Modernity, Nostalgia
ASIA 4300	Open Topics in Asian Literature and Culture (Depending on topic)
ASIA 4840	Independent Study (Depending on topic)

ECON

ECON 4534	Chinese Economic History in Comparative Perspective
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ENGL

ENGL 4018	Global, Transnational and Postcolonial Approaches to Post-1600 Literature (Israel/ Palestine)
ENGL 4287	Special Topics in LGBT Literature (Multicultural and Postcolonial Literature: Post-Orientalism)

GEOG (all modern Asian geography courses)

GEOG 3822	Geography of China
GEOG 3832	Geographies of South Asia
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution
GEOG 4822	Environment and Development in China
GEOG 4832	Geography of Tibet

HIST (all modern Asian history courses)

HIST 1528	Introduction to South Asian History since 1757
HIST 1628	Introduction to Chinese History since 1644
HIST 2110	History of Early Modern Societies (Early Modern China 960-1842)
HIST 2166	The Vietnam Wars
HIST 3628	Seminar in Recent Chinese History
HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan;)
HIST 4109	World War II in Asia and the Pacific
HIST 4166	The Vietnam War in Politics and Culture
HIST 4328	The Modern Middle East, 1600 to the Present
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
HIST 4338	History of Modern Israel/Palestine

HIST 4538	History of Modern India
HIST 4548	Women in Modern India
HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
HIST 4618	Early Modern China, 960-1842
HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
HIST 4648	Inventing Chinese Modernity, 1800 to Present
HIST 4658	China and Islam from the 7th Century to the 20th Century
HIST 4688	Window on Modern China
HIST 4728	Modern Japanese History
HIST 4738	History of Early Modern Japan (1590-1868)
HIST 4758	The History of Postwar Japan, 1945 to Present
HIST 4109	World War II in Asia and the Pacific
HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001

HUMN

HUMN 3341	Literature and Popular Culture in Modern China
HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation

IAFS

IAFS 4500	The Post-Cold War World (Contemporary China - International Views; Cultural Revolution - China 1966-79; China in the Global Economy; Afghanistan and Iraq; South Asia-Conflict/ Resolution)
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JWST

JWST 4338	History of Modern Israel/Palestine
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MDST

MDST 4211	Asian Media and Culture
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PSCI (all modern Asian politics courses)

PSCI 3072	Government and Politics in Southeast Asia
PSCI 3102	South Asian Politics
PSCI 4022	Chinese Foreign Policy
PSCI 4052	Chinese Politics
PSCI 4242	Middle Eastern Politics

RLST (all modern Asian religion courses)

RLST 3820	Topics in Religious Studies (Religion in Modern China)
RLST 4250	Topics in Buddhism
RLST 4650	Islam in the Modern World

WMST (all Asian Women's Studies courses)

WGST 3220	Women in Islam
WGST 3410	Gender, Sexuality and Culture in the Modern Middle East

All modern Asian literature courses

ARAB 3230	Islamic Culture and the Iberian Peninsula
ARAB 3330	The Arabic Novel
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East

ECON 4534	Chinese Economic History in Comparative Perspective	HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan)
EDUC 4800	Special Topics (Asia)	HIST 4109	World War II in Asia and the Pacific
EMUS 1467	World Music Ensemble (Japanese; Gamelan)	HIST 4166	The Vietnam War in Politics and Culture
EMUS 3467	World Music Ensemble (Japanese; Gamelan)	HIST 4328	The Modern Middle East, 1600 to the Present
ENGL 4018	Global, Transnational and Postcolonial Approaches to Post-1600 Literature (Israel/ Palestine)	HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
ENGL 4287	Special Topics in LGBT Literature (Multicultural and Postcolonial Literature: Post-Orientalism)	HIST 4338	History of Modern Israel/Palestine
ETHN 3105	Selected Topics in Asian American Studies (Bruce Lee and Transpacific)	HIST 4339	Borderlands of the British Empire
FILM 2513	Major Asian Filmmakers	HIST 4348	Topics in Jewish History (Tel Aviv-Urban History and Culture)
FILM 4023	Topics in International Cinema (Contemporary Asian Cinema)	HIST 4349	Decolonization of the British Empire
GEOG 3822	Geography of China	HIST 4378	History of Modern Jewish-Muslim Relations
GEOG 3832	Geographies of South Asia	HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
GEOG 4742	Topics in Environment and Society (Depending on topic)	HIST 4538	History of Modern India
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	HIST 4548	Women in Modern India
GEOG 4822	Environment and Development in China	HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
GEOG 4832	Geography of Tibet	HIST 4618	Early Modern China, 960-1842
HIND 3400	Special Topics	HIST 4619	Women in East Asian History
HIND 3441	Screening India: A History of Bollywood Cinema	HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination	HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
HIND 3661	South Asian Diasporas: Imagining Home Abroad	HIST 4648	Inventing Chinese Modernity, 1800 to Present
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature	HIST 4658	China and Islam from the 7th Century to the 20th Century
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture	HIST 4688	Window on Modern China
HIND 3851	Devotional Literature in South Asia	HIST 4718	Ancient, Classical, and Medieval Japanese History
HIST 1308	Introduction to Middle Eastern History	HIST 4728	Modern Japanese History
HIST 1438	Introduction to Korean History	HIST 4738	History of Early Modern Japan (1590-1868)
HIST 1518	Introduction to South Asian History to 1757	HIST 4758	The History of Postwar Japan, 1945 to Present
HIST 1528	Introduction to South Asian History since 1757	HIST 4808	Special Topics in World Areas History (Chinese and Japanese Modernity)
HIST 1618	Introduction to Chinese History to 1644	HUEN 3750	Xi'an, China: Self-Awareness and Images of the Other
HIST 1628	Introduction to Chinese History since 1644	HUEN 3843	Special Topics (China through the Eyes of the West)
HIST 1708	Introduction to Japanese History	HUMN 3093	Topics in Humanities (Representing Islam; The Arabic Novel; Narrating the City)
HIST 1800	Introduction to Global History (Maritime Asia 1500-1800)	HUMN 3321	Culture and Literature of Ancient China
HIST 1818	Introduction to Jewish History: Bible to 1492	HUMN 3341	Literature and Popular Culture in Modern China
HIST 2110	History of Early Modern Societies (Early Modern China 960-1842)	HUMN 3811	Love, Death, and Desire: Classical Japanese Literature in Translation
HIST 2166	The Vietnam Wars	HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation
HIST 2220	History of War and Society (Warfare and Culture in South Asia; Militarism in Japanese History; Korea through Wars; Warfare in India; The Iraq Wars)	HUMN 4100	Writing the World in Traditional China
HIST 2629	China in World History	IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East; Turkey—Mediator/Arab Spring; Gender, Geopolitics and Islam)
HIST 3109	Seminar in Asian History	IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
HIST 3328	Seminar in Middle Eastern History	IAFS 3650	History of Arab-Israeli Conflict
HIST 3628	Seminar in Recent Chinese History		
HIST 3718	Seminar in Japanese History		

IAFS 4500	The Post-Cold War World (Contemporary China/ International Views; Cultural Revolution/ China 1966-79; China in the Global Economy; Afghanistan and Iraq; South Asia/Conflict/ Resolution; Arab Awakening)	JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
INBU 3300	International Business and Management	JWST 3650	History of Arab-Israeli Conflict
INBU 3301	Doing Business in China	JWST 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)
INBU 4151	International Operations in Hong Kong	JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
INBU 4200	International Financial Management	JWST 4338	History of Modern Israel/Palestine
JPNS 1051	Masterpieces of Japanese Literature in Translation	JWST 4378	History of Modern Jewish-Muslim Relations
JPNS 2441	Japanese Culture through Film and Anime	MDST 4211	Asian Media and Culture
JPNS 2811	Heroes and the Supernatural: Word and Image in Old Japan	MDST 4341	International Media and Global Crises
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization	MUEL 2772	World Musics: Asia and Oceania
JPNS 3331	Business Japanese	MUSC 4152	East Asian Music
JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl	PHIL 1600	Philosophy and Religion
JPNS 3811	Love, Death, and Desire: Classical Japanese Literature in Translation	PHIL 3800	Open Topics in Philosophy (Buddhism as Philosophy)
JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation	PSCI 3072	Government and Politics in Southeast Asia
JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation	PSCI 3102	South Asian Politics
JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation	PSCI 4022	Chinese Foreign Policy
JPNS 3851	Studies in Japanese Popular Culture	PSCI 4028	Special Topics (Politics of Southeast Asia)
JPNS 3861	Imagining the Samurai in Japanese Literature and Culture	PSCI 4052	Chinese Politics
JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture	PSCI 4242	Middle Eastern Politics
JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture	RLST 2202	Islam
JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture	RLST 2320	The Muslim World, 600-1250
JPNS 4050	Japanese Sociolinguistics: Japanese Language and Society	RLST 2600	Judaism, Christianity, and Islam
JPNS 4070	Second Language Acquisition of Japanese	RLST 2610	Religions of India
JPNS 4080	Kanji in Japanese Orthography	RLST 2612	Yoga: Ancient and Modern
JPNS 4150	Japanese to English Translation: Theory and Practice	RLST 2620	Religions of East Asia
JPNS 4210	Contemporary Japanese 1: Current Issues	RLST 3040	The Quran
JPNS 4300	Open Topics: Readings in Japanese	RLST 3060	Fundamentalism and Islam
JPNS 4310	Classical Japanese 1	RLST 3100	Judaism
JPNS 4320	Classical Japanese 2	RLST 3200	Hinduism
JPNS 4400	Critical Theory and Japanese Literature and Culture	RLST 3300	Foundations of Buddhism
JPNS 4900	Independent Study	RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JPNS 4980	Practical Issues in Japanese Language Pedagogy	RLST 3750	Women in Buddhism
KREN 2441	Film and Korean Culture	RLST 3800	Chinese Religions
KREN 3841	Modern Korean Literature in English Translation	RLST 3820	Topics in Religious Studies (Religion in Modern China; Buddhist Art and Ritual; Buddhist Literature in Tibet; Islam, Politics and Militancy; Story of the Quran; Art in Asian Religions; The Mystical Path of Islam/Sufism)
KREN 4900	Independent Study	RLST 4200	Topics in Hinduism
JWST 1818	Introduction to Jewish History: Bible to 1492	RLST 4250	Topics in Buddhism (Buddhist Literature in Tibet; Transnational Buddhism; Buddhist Ethics; Buddhist Ethics; Buddhist Philosophy; Buddhism and Society; Buddhist Esotericism)
JWST 2600	Judaism, Christianity, and Islam	RLST 4260	Topics in Judaism (Bible in Judaism/Christianity)
JWST 3100	Judaism	RLST 4650	Islam in the Modern World
		RLST 4750	Daoism
		WGST 2600	Gender, Race, and Class in a Global Context
		WGST 3012	Women and Development
		WGST 3220	Women in Islam

WGST 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST 3500	Global Gender Issues
WGST 3750	Women in Buddhism
WGST 4619	Women in East Asian History

Astrophysical and Planetary Sciences

The Department of Astrophysical and Planetary Sciences is one of the few programs that combines both astrophysics and planetary science, providing a unified view of space sciences, the solar system and comparative planetology, stellar and galactic astronomy, and cosmology. Students are given hands-on experience with telescopes, optics, instrumentation, and computer-image processing and modeling.

Course code for this program is ASTR.

Bachelor's Degree

- Astronomy - Bachelor of Arts (BA) (p. 212)

Minor

- Astronomy - Minor (p. 214)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Armitage, Philip J (https://experts.colorado.edu/display/fisid_124718)
Professor; PhD, University of Cambridge (England)

Ayres, Thomas R (https://experts.colorado.edu/display/fisid_100090)
Research Professor; PhD, University of Colorado Boulder

Baker, Daniel N (https://experts.colorado.edu/display/fisid_103264)
Distinguished Professor; PhD, University of Iowa

Bally, John (https://experts.colorado.edu/display/fisid_105710)
Professor; PhD, University of Massachusetts at Amherst

Barth, Charles A.
Professor Emeritus

Begelman, Mitchell C (https://experts.colorado.edu/display/fisid_100446)
Professor; PhD, University of Cambridge (England)

Brain, David A (https://experts.colorado.edu/display/fisid_149098)
Assistant Professor; PhD, University of Colorado Boulder

Brown, Benjamin P (https://experts.colorado.edu/display/fisid_153758)
Assistant Professor; PhD, University of Colorado Boulder

Burns, Jack O (https://experts.colorado.edu/display/fisid_124317)
Professor; PhD, Indiana University Bloomington

Cash, Webster C (https://experts.colorado.edu/display/fisid_101759)
Professor; PhD, University of California-Berkeley

Comerford, Julia M (https://experts.colorado.edu/display/fisid_151471)
Assistant Professor; PhD, University of California-Berkeley

Conti, Peter S.
Professor Emeritus

Cranmer, Steven (https://experts.colorado.edu/display/fisid_155051)
Associate Professor; PhD, University of Delaware

Danforth, Charles W. (https://experts.colorado.edu/display/fisid_130779)
Instructor

Darling, Jeremiah K (https://experts.colorado.edu/display/fisid_141767)
Associate Professor; PhD, Cornell University

Dulk, George A.
Professor Emeritus

Duncan, Douglas K (https://experts.colorado.edu/display/fisid_126824)
Senior Instructor

Ellingson, Erica (https://experts.colorado.edu/display/fisid_100118)
Associate Professor; PhD, University of Arizona

Ergun, Robert E (https://experts.colorado.edu/display/fisid_115912)
PhD, University of California-Berkeley

Esposito, Larry Wayne (https://experts.colorado.edu/display/fisid_100502)
Professor; PhD, University of Massachusetts at Amherst

France, Kevin Christopher (https://experts.colorado.edu/display/fisid_145201)
Assistant Professor; PhD, Johns Hopkins University

Glenn, Jason (https://experts.colorado.edu/display/fisid_115556)
Professor; PhD, University of Arizona

Green, James C (https://experts.colorado.edu/display/fisid_102344)
Professor; PhD, University of California-Berkeley

Halverson, Nils W (https://experts.colorado.edu/display/fisid_134252)
Associate Professor; PhD, California Institute of Technology

Hamilton, Andrew J S (https://experts.colorado.edu/display/fisid_101517)
Professor; PhD, University of Virginia

Hindman, Bradley W (https://experts.colorado.edu/display/fisid_103726)
Asst Research ProfessorLecturer; PhD, University of Colorado Boulder

Hornstein, Seth D (https://experts.colorado.edu/display/fisid_144237)
Senior Instructor; PhD, University of California-Los Angeles

Linsky, Jeffrey
Professor Emeritus

Malville, J. McKim
Professor Emeritus

McCray, Richard A.
Professor Emeritus

Rast, Mark Peter (https://experts.colorado.edu/display/fisid_142997)
Associate Professor; PhD, University of Colorado Boulder

Schneider, Nicholas M (https://experts.colorado.edu/display/fisid_102620)
Associate Professor; PhD, University of Arizona

Shull, J Michael (https://experts.colorado.edu/display/fisid_103350)
Professor; PhD, Princeton University

Snow, Theodore P. Jr
Professor Emeritus

Speiser, Theodore W.
Professor Emeritus

Stocke, John T (https://experts.colorado.edu/display/fisid_103369)
Professor; PhD, University of Arizona

Thomas, Gary E.
Professor Emeritus

Toomre, Juri (https://experts.colorado.edu/display/fisid_100767)
Professor; PhD, University of Cambridge (England)

ASTR 1000 (3) The Solar System

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1010, but without lab ASTR 1010 or ASTR 1030

Requisites: Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Non-Sequence
MAPS Course: Natural Science

ASTR 1010 (4) Introductory Astronomy 1

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Requires nighttime observations at Sommers-Bausch Observatory.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1000, but with additional lab ASTR 1000 or ASTR 1030

Requisites: Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Lab
MAPS Course: Natural Science Lab or Lab/Lec

ASTR 1020 (4) Introductory Astronomy 2

Non-science majors learn the nature and workings of the Sun, stars, neutron stars, black holes, galaxies, quasars, structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory. Includes recitation. Sequence link ASTR 1010.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1040 and ASTR 1200

Requisites: Requires a prerequisite course of ASTR 1000 or ASTR 1010 (minimum grade C-). Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 1030 (4) Accelerated Introductory Astronomy 1

Covers principles of modern astronomy summarizing our present knowledge about the Earth, Sun, moon, planets and origin of life. Requires nighttime observation sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Like ASTR 1000 and 1010, but taught at a higher intellectual level, including a significant amount of quantitative analysis.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1000 or ASTR 1010

Requisites: Requires prerequisite or corequisite course of MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec
Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

ASTR 1040 (4) Accelerated Introductory Astronomy 2

Covers principles of modern astronomy summarizing our present knowledge about the Sun, stars, birth and death of stars, neutron stars, black holes, galaxies, quasars, and the organization and origins of the universe. May require nighttime observing sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Includes a recitation. Taught at a higher intellectual level including a significant amount of quantitative analysis.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1020 and ASTR 1200

Requisites: Requires prerequisite course of ASTR 1010 or ASTR 1030 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physical Sci:Lec
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

ASTR 1200 (3) Stars and Galaxies

Non-science majors are introduced to the nature and workings of the Sun, stars, neutron stars, black holes, interstellar gas, galaxies, quasars, plus structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities to attend nighttime observation sessions at Sommers-Bausch Observatory.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1020 and ASTR 1040

Requisites: Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2000 (3) Ancient Astronomies of the World

Documents the numerous ways in which observational astronomy and cosmology have been features of ancient cultures. Includes naked eye astronomy, archaeoastronomy, ethnoastronomy, concepts of time, calendrics, cosmogony, and cosmology.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2010 (3) Modern Cosmology-Origin and Structure of the Universe

Introduces modern cosmology to nonscience majors. Covers the Big Bang; the age, size, and structure of the universe; and the origin of the elements and of stars, galaxies, the solar system, and life.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2020 (3) Space Astronomy and Exploration

Covers physical principles of performing astronomy from space for science and exploration. The basic design of launch vehicles and spacecraft, orbital dynamics, and instruments will be described in the context of specific space missions (e.g. Hubble Telescope, Mars rovers) as well as prospects for future space observatories in orbit and on the Moon.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ASTR 2030 (3) Black Holes

Black holes are one of the most bizarre phenomena of nature. Students are introduced to the predicted properties of black holes, astronomical evidence for their existence and formation, and modern ideas about space, time, and gravity.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ASTR 2040 (3) The Search for Life in the Universe

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars. Credit only for this course or ASTR 3300.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 2040

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ASTR 2050 (3) The Sun and Society: Living with an Active Star

Introduces non-science majors to the many ways out Sun influences life and society. Covers how the Sun generates energy, how it evolves over billions of years, how it affects Earth's climate and biology, how it produces dangerous "space weather", how we can harness its power and how life in other solar systems would depend on the properties of their Suns.

Grading Basis: Letter Grade

ASTR 2500 (3) Gateway to Space

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 1400

Requisites: Restricted to Astrophysics (ASTR) majors only.

ASTR 2600 (3) Introduction to Scientific Programming

Introduces principles, methods and tools of scientific programming commonly used in reach. Topics include an introduction to programming in Python, data structures, numerical methods for calculus and data manipulation/visualization. Techniques covered are relevant to many technical fields but emphasis is placed on application to problems in astronomy and planetary science. Class time is split between lectures and in-lab tutorials.

ASTR 2840 (1-3) Independent Study

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

ASTR 3300 (3) Extraterrestrial Life

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science. Credit only for this course or ASTR 2040.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3300

ASTR 3510 (4) Observations and Instrumentation 1

Lab course in astronomical observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, basic optical design and instrumentation and statistical analysis of data, with emphasis on imaging applications. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

Requisites: Requires a prerequisite or corequisite core of APPM 1360 or MATH 2300 and ASTR 1020 or ASTR 1040 and PHYS 1120 (all minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

ASTR 3520 (4) Observations and Instrumentation 2

Lab course in observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, optical design and instrumentation, and statistical analysis, with emphasis on spectroscopy. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

Requisites: Requires a prerequisite course of ASTR 3510 (minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

ASTR 3560 (3) Astronomical Instrumentation Laboratory

Teaches students aspects of astronomical instrument design in a hands-on setting. Students will learn elementary principles of geometrical optics, diffraction, light detection, signal conditioning, data acquisition and motion control, and mechanical design. Students will apply these principles working in groups to design and build optical spectrometers.

Requisites: Requires prerequisites courses of ASTR 1040 and MATH 2300 or APPM 1360 and PHYS 2170 (minimum grade C-).

Grading Basis: Letter Grade

ASTR 3710 (3) Formation & Dynamics of Planetary Systems

Covers the origin of planetary systems and their dynamical evolution. Topics include the physics and chemistry of planetary formation, orbital mechanics and extrasolar planets. This course and ASTR 3720 and ASTR 3750 may be taken in any order. Elective for APS major and minor.

Requisites: Requires prerequisite course of PHYS 1120 and MATH 2300 or APPM 1360 (all minimum grade C-).

ASTR 3720 (3) Planets and Their Atmospheres

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3720

Requisites: Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

ASTR 3730 (3) Astrophysics 1 - Stellar and Interstellar

Provides a quantitative introduction to the radiative and gravitational physics relevant to stellar and galactic astrophysics, as applied to understanding observations of stars, stellar evolution, stellar remnants and the structure of the Milky Way. Elective for APS major and minor.

Requisites: Requires prerequisite courses of PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

ASTR 3740 (3) Cosmology and Relativity

Special and general relativity as applied to astrophysics, cosmological models, observational cosmology, experimental relativity and the early universe. Elective for APS major and minor.

Requisites: Requires prerequisite courses of PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

ASTR 3750 (3) Planets, Moons, and Rings

Approaches the physics of planets, emphasizing their surfaces, satellites, and rings. Topics include formation and evolution of planetary surfaces, history of the terrestrial planets, and dynamics of planetary rings. This course and ASTR 3720 may be taken for credit in any order. Elective for APS major and minor.

Requisites: Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

ASTR 3760 (3) Solar and Space Physics

Explores the physical processes linking the Sun and planets, emphasizing solar radiative and particulate variability and the response of planetary atmospheres and magnetospheres. Topics include the solar dynamo, solar wind, coronal mass ejections, cosmic ray modulation, magnetospheres, aurora, the space environment, and climate variability. Elective for APS major and minor.

Requisites: Requires prerequisite or corequisite courses of PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

Recommended: Prerequisite PHYS 3310.

ASTR 3800 (3) Introduction to Scientific Data Analysis and Computing

Introduces scientific data analysis from a practical perspective. Covers statistical analysis, model fitting, error analysis, theoretical compliance and image analysis with examples from space-based and ground-based astronomy. Elective for APS major. Opened to qualified non-majors with instructor consent.

Requisites: Requires prerequisite course of ASTR 2600 and prerequisite or corequisite courses of ASTR 1020 or ASTR 1040 and PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

ASTR 3830 (3) Astrophysics 2 - Galactic and Extragalactic

The second semester of a year-long introduction to astrophysical processes. The physical processes developed in ASTR 3730 are applied to topics in extragalactic astronomy, including galaxies, supermassive black holes, galaxy clusters and cosmology. Elective for APS major and minor.

Requisites: Requires prerequisite courses of ASTR 3730 and PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

ASTR 4330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5330 and GEOL 4330 and GEOL 5330

ASTR 4500 (1-3) Special Topics in Astrophysical and Planetary Sciences

Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

ASTR 4800 (3) Space Science: Practice and Policy

Exposes students to current controversies in science that illustrate the scientific method and the interplay of observation, theory, and science policy. Students research and debate both sides of the issues, which include strategies and spin-offs of space exploration, funding of science, big vs. small science, and scientific heresy and fraud.

Recommended: Prerequisite one year of college level astronomy or physics.

ASTR 4840 (1-3) Independent Study

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

ASTR 4841 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Astronomy - Bachelor of Arts (BA)

The Department of Astrophysical & Planetary Sciences (APS) offers an astronomy degree with two tracks: general astronomy (APS only), and astrophysics/physics (supervised jointly by APS and the Department of Physics).

The specific goals of the astronomy major are:

- To provide both practical and theoretical knowledge of astronomy and astrophysics at a level comparable to the best programs at other major U.S. public institutions. The APS Department is one of the few programs that combines both astrophysics and planetary science. As a result, we avoid duplications of overlapping curricula, and provide a unified view of space sciences, the solar system and comparative planetology, stellar and galactic astronomy, and cosmology.
- To provide courses on, and significant hands-on experience with, telescopes, optics, instrumentation, computer image processing, and computer modeling. Such skills are useful for students wishing to pursue graduate degrees or careers in aerospace, technical or computer industries.
- To provide opportunities for faculty-advised research and senior (honors) theses.

We offer you the ability to graduate with honors. This requires you maintain a minimum GPA and that you write and defend an honors thesis. More information can be obtained from the APS department office and/or the Honors Council Representative (Erica Ellingson). For more general information about the honors thesis, visit the College of Arts and Sciences Honors Program (<http://www.colorado.edu/honors>) website.

For more information about the astronomy degree, visit the department's Undergraduate Studies (<http://www.colorado.edu/aps/undergraduate-students/prospective-students>) webpage.

Program Tracks

General Astronomy Track

The bachelor's degree in astronomy with a concentration in general astronomy is designed to meet student needs for basic, undergraduate training in space sciences (astronomy, astrophysics, planetary sciences and space physics). Undergraduates are prepared for both academic research assistant careers and the industrial market (aerospace, computer software, instrumentation and other technical areas) as well as for science education, science journalism and space policy. This track provides a broad program in the science of astronomy, observations and technology as well as core training in astronomical sciences and mathematics, applied physics and computational and instrumental technology for professions in the space sciences. The track can focus on observations (ground-based telescopes, rocket probes, space-borne observatories) or on K-12 science education, for which astronomy provides excellent science content for motivating young students. It also offers broad training for careers in science policy and science writing.

Astrophysics/Physics Track

This track is directed toward students interested in pursuing graduate studies in astrophysics. For these students, we require multidisciplinary work in physics and mathematics together with astronomy. This track offers a superior experience for students, with "value added" from the professional astrophysics and planetary science faculty in APS. Graduates will be provided with scientific and technological training in the space sciences, including mathematical, physical, computational, and instrumental expertise. An honors thesis or other research work is encouraged, but not required.

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in astronomy, in addition to completing all the current requirements for the BA with a major in astronomy at the home institution, students must complete one full-time semester of experiential, customized, international learning at the non-home institution.

Requirements

General Astronomy Track

This is appropriate for someone aiming for a career in K–12 education, science journalism, science policy, information technology, science management or technical work that does not require a graduate degree.

Students must complete a minimum of 32 credit hours in astronomy (this must include at least 18 upper-division credit hours) and a minimum of 9 credit hours in physics.

Required Courses and Credit Hours

Required Courses

ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2 ¹	8
PHYS 1110	General Physics 1	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1

Select one of the following: 3

ASTR 2500/ ASEN 1400	Gateway to Space	
ASTR 2600	Introduction to Scientific Programming	
PHYS 2130	General Physics 3	
PHYS 2170	Foundations of Modern Physics	

Select a minimum of two of the following: 6

ASTR 2000	Ancient Astronomies of the World	
ASTR 2010	Modern Cosmology-Origin and Structure of the Universe	
ASTR 2020	Space Astronomy and Exploration	
ASTR 2030	Black Holes	
ASTR 2040	The Search for Life in the Universe	
ASTR 2500	Gateway to Space	
ASTR 2600	Introduction to Scientific Programming	
ASTR 3300	Extraterrestrial Life	

Select one of the following upper-division course sequences: 6

ASTR 3720 & ASTR 3750	Planets and Their Atmospheres and Planets, Moons, and Rings	
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ASTR 3730 & ASTR 3830	Astrophysics 1 - Stellar and Interstellar and Astrophysics 2 - Galactic and Extragalactic	
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Electives

Select four additional courses from the following or from those sequence courses not used for the upper-division sequence requirement above: 12-15

ASEN 4010	Introduction to Space Dynamics	
ASTR 3510	Observations and Instrumentation 1	
ASTR 3520	Observations and Instrumentation 2	
ASTR 3710	Formation & Dynamics of Planetary Systems	
ASTR 3740	Cosmology and Relativity	
ASTR 3760	Solar and Space Physics	
ASTR 3800	Introduction to Scientific Data Analysis and Computing	
ASTR 4330	Cosmochemistry	
ASTR 4800	Space Science: Practice and Policy	
ASTR 5760	Astrophysical Instrumentation	
ATOC 4720	Introduction to Atmospheric Dynamics	

Required ancillary calculus course work:

Select one of the following sequences: 8-10

APPM 1350 & APPM 1360	Calculus 1 for Engineers and Calculus 2 for Engineers	
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	

Required ancillary science sequence with lab:

Select one other science sequence with lab. Can be satisfied by any sequence that satisfies arts and sciences core curriculum in natural sciences with lab, for example: ² 7-10

CHEM Sequence:		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
EBIO Sequence:		
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	
GEOL Sequence:		
GEOL 1010 & GEOL 1030	Introduction to Geology and Introduction to Geology Laboratory 1	
GEOL 1020	Introduction to Earth History	
ATOC Sequence:		
ATOC 1050 & ATOC 1070	Weather and the Atmosphere and Weather and the Atmosphere Laboratory	
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate	

Total Credit Hours 59-67

¹ Or ASTR 1010 and ASTR 1020 with permission.

² Or equivalent.

Astrophysics/Physics Track (Jointly Supervised by the APS and Physics Departments)

For students aiming for a graduate program in astronomy or planetary sciences. Similar to Physics Plan 2 (Astrophysics), with additional astrophysics instrumentation labs and different electives.

Students must complete a minimum of 23 credit hours in astronomy and a minimum of 28 credit hours in physics (this must include at least 15 upper-division credit hours in astronomy and 12 in physics).

Required Courses and Credit Hours

Lower-Division Course Work

The following courses are required:

ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2	8
PHYS 1110 & PHYS 1120 & PHYS 1140	General Physics 1 and General Physics 2 and Experimental Physics 1	9
PHYS 2170 & PHYS 2150	Foundations of Modern Physics and Experimental Physics 2	4
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3

Upper-Division Course Work

The following physics courses are required:

PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3

Select one of the following two astronomy sequences (6-hour minimum): 6

ASTR 3720 & ASTR 3750	Planets and Their Atmospheres and Planets, Moons, and Rings	
ASTR 3730 & ASTR 3830	Astrophysics 1 - Stellar and Interstellar and Astrophysics 2 - Galactic and Extragalactic	

Select three additional courses from the following or from those sequence courses not used above (9-hour minimum): 9

ASTR 3510	Observations and Instrumentation 1	
ASTR 3520	Observations and Instrumentation 2	
ASTR 3710	Formation & Dynamics of Planetary Systems	
ASTR 3740	Cosmology and Relativity	
ASTR 3760	Solar and Space Physics	
ASTR 3800	Introduction to Scientific Data Analysis and Computing	
ASTR 4330	Cosmochemistry	
ATOC 4720	Introduction to Atmospheric Dynamics	
ASEN 4010	Introduction to Space Dynamics	
Any ASTR 5000- or 6000-level course with instructor's permission		

Suggested physics electives:

PHYS 4150	Plasma Physics	
PHYS 4230	Thermodynamics and Statistical Mechanics	
PHYS 4410	Quantum Mechanics 2	
PHYS 4420	Nuclear and Particle Physics	
PHYS 4510	Optics	

Required ancillary calculus course work: 16-18

Select one of the following sequence of courses:

APPM 1350 Calculus 1 for Engineers
& APPM 1360 and Calculus 2 for Engineers
& APPM 2350 and Calculus 3 for Engineers
& APPM 2360 and Introduction to Differential Equations with Linear Algebra

MATH 1300 Calculus 1
& MATH 2300 and Calculus 2
& MATH 2400 and Calculus 3
& APPM 2360 and Introduction to Differential Equations with Linear Algebra

Total Credit Hours

67-69

Astronomy - Minor

Declaration of a minor in astrophysical and planetary sciences is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements

Course work applied to the minor may be applied to another major or toward core curriculum requirements. Minimum requirements for a minor include:

- a minimum of six ASTR courses (18 credit hours), including at least three advanced courses (numbered above 3500) (9 credit hours), and
- all course work applied to a minor must be completed with a grade of C- or better; no pass/fail work may be applied. The GPA for all minor degree course work must be equal to 2.00 (C) or higher, and
- students pursuing an individually structured major or a major in distributed studies are not eligible to earn a minor, and
- students are allowed to apply no more than three courses, including two advanced courses, of transfer work toward a minor.

Required Courses and Credit Hours

Elementary

Select a maximum of three courses from the following:

ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2 ¹
ASTR 2000	Ancient Astronomies of the World
ASTR 2010	Modern Cosmology-Origin and Structure of the Universe
ASTR 2020	Space Astronomy and Exploration
ASTR 2030	Black Holes
ASTR 2040	The Search for Life in the Universe
ASTR 2500/ ASEN 1400	Gateway to Space
ASTR 2600	Introduction to Scientific Programming
ASTR 3300	Extraterrestrial Life

Advanced

Select one of the following upper division course sequences:

Planetary Sequence:

ASTR 3720 Planets and Their Atmospheres
& ASTR 3750 and Planets, Moons, and Rings

Astrophysics Sequence:

ASTR 3730 Astrophysics 1 - Stellar and Interstellar
& ASTR 3830 and Astrophysics 2 - Galactic and Extragalactic

Select a minimum of one of the following:

ASTR 3510 Observations and Instrumentation 1

ASTR 3520	Observations and Instrumentation 2
ASTR 3710	Formation & Dynamics of Planetary Systems
ASTR 3720	Planets and Their Atmospheres
ASTR 3730	Astrophysics 1 - Stellar and Interstellar
ASTR 3740	Cosmology and Relativity
ASTR 3750	Planets, Moons, and Rings
ASTR 3760	Solar and Space Physics
ASTR 3830	Astrophysics 2 - Galactic and Extragalactic
ASTR 4330	Cosmochemistry
ASTR 4840	Independent Study
ATOC 4720	Introduction to Atmospheric Dynamics
Total Credit Hours	18

¹ Or ASTR 1010 and ASTR 1020 with permission.

Additional information is available from any faculty mentor. See http://aps.colorado.edu/undergrad_main.html.

Atmospheric and Oceanic Sciences

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

ATOC began offering an undergraduate major in fall 2016. This Bachelor of Arts degree is the first of its kind at CU Boulder for students interested in an in-depth understanding of the physical basis for the role of the atmosphere and oceans in Earth's climate system. In addition, ATOC offers a minor in atmospheric and oceanic sciences for students pursuing a bachelor's degree in another academic department. ATOC also offers many courses approved for the Natural Science requirement of the College of Arts & Sciences Core Curriculum.

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit www.colorado.edu/atoc (<http://www.colorado.edu/atoc>).

Course code for this program is ATOC.

Bachelor's Degree

- Atmospheric and Oceanic Sciences - Bachelor of Arts (BA) (p. 217)

Minor

- Atmospheric and Oceanic Sciences - Minor (p. 220)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Brown, Derek Philip (https://experts.colorado.edu/display/fisid_150027)
Instructor; PhD, University of Colorado Boulder

Cassano, John J. (https://experts.colorado.edu/display/fisid_121781)
Associate Professor; PhD, University of Wyoming

Forrest, Betsy Carroll (https://experts.colorado.edu/display/fisid_101645)
Lecturer; PhD, University of Colorado Boulder

Friedrich, Katja (https://experts.colorado.edu/display/fisid_133607)
Associate Professor; PhD, Ludwig-Maximilians Univ of Munich (Germany)

Han, Weiqing (https://experts.colorado.edu/display/fisid_115493)
Professor; PhD, Nova University

Hart, John E.
Professor Emeritus

Jahn Hall, Alexandra (https://experts.colorado.edu/display/fisid_155096)
Assistant Professor; PhD, McGill Univ (Canada)

Karnauskas, Kristopher Benson (https://experts.colorado.edu/display/fisid_155094)
Assistant Professor; PhD, University of Maryland College Park Campus

Kay, Jennifer E. (https://experts.colorado.edu/display/fisid_153815)
Assistant Professor; PhD, University of Washington

Keen, Richard A.
Professor Emeritus

Lovenduski, Nicole Suzanne (https://experts.colorado.edu/display/fisid_147557)
Assistant Professor; PhD, University of California-Los Angeles

Lundquist, Julie Kay (https://experts.colorado.edu/display/fisid_147838)
Associate Professor; PhD, University of Colorado Boulder

Nigro, Melissa A (https://experts.colorado.edu/display/fisid_152154)
Instructor; PhD, University of Colorado Boulder

Pilewskie, Peter Andrew (https://experts.colorado.edu/display/fisid_134466)
Professor; PhD, University of Arizona

Randall, Cora Einterz (https://experts.colorado.edu/display/fisid_102010)
Professor; PhD, University of California-Santa Cruz

Toohy, Darin W (https://experts.colorado.edu/display/fisid_110652)
Professor; PhD, Harvard University

Toon, Owen Brian (https://experts.colorado.edu/display/fisid_110521)
Professor; PhD, Cornell University

Weiss, Jeffrey B (https://experts.colorado.edu/display/fisid_102145)
Associate Professor; PhD, University of California-Berkeley

ATOC 1050 (3) Weather and the Atmosphere

Introduces principles of modern meteorology for nonscience majors, with emphasis on scientific and human issues associated with severe weather events. Includes description, methods of prediction, and impacts of blizzards, hurricanes, thunderstorms, tornadoes, lightning, floods, and firestorms.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence
MAPS Course: Natural Science

ATOC 1060 (3) Our Changing Environment: El Nino, Ozone, and Climate

Discusses the Earth's climate for nonscience majors, focusing on the role of the atmosphere, oceans, cryosphere and land surface. Describes the water cycle, atmospheric circulations and ocean currents, and how they influence global climate, El Nino and the ozone hole. Discusses human impacts from climate change.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 1060

Recommended: Prerequisite ATOC 1050.

Additional Information: Arts Sci Core Curr: Natural Science Sequence

ATOC 1070 (1) Weather and the Atmosphere Laboratory

Illustrates fundamentals of meteorology with laboratory experiments. Covers collection, analysis and discussion of data related to local weather. Uses computers for retrieval and interpretation of weather data from Colorado and across the U.S. Optional lab for ATOC 1050.

Recommended: Prerequisite or corequisite ATOC 1050.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

ATOC 3050 (3) Principles of Weather

Explores the processes that influence middle latitude weather including atmospheric thermodynamics, cloud and precipitation processes, atmospheric dynamics, air masses and fronts, and mid-latitude cyclones. Recitations and homework assignments will allow students to apply these concepts to real weather data through analysis of weather maps, thermodynamics diagrams and conceptual models.

Recommended: Prerequisites ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3070 (3) Introduction to Oceanography

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3070

Recommended: Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3180 (3) Aviation Meteorology

Familiarizes students with a wide range of atmospheric behavior pertinent to air travel: rudiments of aerodynamics; aircraft stability and control; atmospheric circulation, vertical motion, turbulence and wind shear; fronts, clouds and storms.

Recommended: Prerequisite ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3300 (3) Analysis of Climate and Weather Observations

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3301

Recommended: Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENVS 3600 or GEOG 1001 and one semester calculus.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3500 (3) Air Chemistry and Pollution

Examines the composition of the atmosphere and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3151

Recommended: Prerequisite one semester of college-level chemistry or one year of high school chemistry.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3600 (3) Principles of Climate

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3601 and ENVS 3600

Recommended: Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3720 (3) Planets and Their Atmospheres

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 3720

Requisites: Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Astronomy (ASTR) or Atmospheric Oceanic Sciences (ATOC) majors only.

ATOC 4200 (3) Biogeochemical Oceanography

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5200

Recommended: Prerequisites one semester of calculus and one semester of chemistry.

ATOC 4215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5215 and ASEN 4215 and ASEN 5215

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ATOC 4500 (1-3) Special Topics in Atmospheric and Oceanic Sciences

Acquaints students with current research in atmospheres, oceans, and climate. Topics may vary each semester. May be repeated for a total of 9 total credit hours within the degree. Students may register for more than one section of this course in the same semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ATOC 4550 (3) Mountain Meteorology

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5550

Recommended: Prerequisite ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 4700 (3) Weather Analysis & Forecasting

Utilizing a range of operational weather observations to analyze current weather conditions, providing hands-on experience interpreting observations and relating those observations to the physical principles that govern atmospheric behavior is the course emphasis. It focuses on how to read weather reports, analyze observations, and how to prepare weather maps to analyze current conditions and how to interpret numerical weather forecasts.

Recommended: Prerequisite ATOC 1050 or ATOC 1060 or ATOC 4720 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 4710 (3) Introduction to Atmospheric Physics

Provides a fundamental overview of the physics of Earth's atmosphere. Topics include atmospheric composition and structure, atmospheric radiation and optics (rainbows, halos and other phenomena), atmospheric thermodynamics, cloud physics and atmospheric electricity and lightning. Including both descriptive and quantitative approaches to the subject material. Where applicable, observations from the ATOC Skywatch Observatory will be introduced.

Recommended: Prerequisite one year of calculus and one year of physics with calculus.

ATOC 4720 (3) Introduction to Atmospheric Dynamics

Introduces the fundamental physical principles that govern the atmospheric circulations across a range of spatial and temporal scales and provides a quantitative description and interpretation of a wide range of atmospheric phenomena. Topics include atmospheric forces, governing equations, balanced and unbalanced flows, atmospheric waves and mid-latitude cyclones.

Recommended: Prerequisite one year of calculus and one semester of physics with calculus.

ATOC 4730 (3) Physical Oceanography and Climate

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Niño, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5730

Grading Basis: Letter Grade

ATOC 4750 (3) Desert Meteorology and Climate

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5750

Recommended: Prerequisites one semester of calculus and ATOC 1050 or ATOC 1060 or ATOC 3600 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 4770 (3) Wind Energy Meteorology

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5770

Recommended: Prerequisite ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 4800 (3) Policy Implications of Climate Controversies

Examines controversial issues related to the environment, including climate change. Covers scientific theories and the intersection between science and governmental policy. Includes discussion, debate and critical reading of textual materials. Department enforced prerequisite: ATOC 1060 or ATOC 3600.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5000 and ENV5 5830

ATOC 4900 (1-3) Independent Study

Department enforced prerequisite: instructor consent.

Repeatable: Repeatable for up to 6.00 total credit hours.

ATOC 4950 (1-3) Honors Thesis

Students work independently on a research topic under the guidance of a faculty member. A written thesis and an oral presentation of the work are required. Registration by arrangement and with consent of faculty mentor. Department enforced prerequisite: minimum 3.00 GPA.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course

Atmospheric and Oceanic Sciences - Bachelor of Arts (BA)

The Atmospheric and Oceanic Sciences (ATOC) Bachelor of Arts degree is the first of its kind at the University of Colorado Boulder for students interested in an in-depth understanding of the physical basis for the role of the atmosphere and oceans in Earth's climate system. An ATOC degree will prepare students to pursue a wide range of careers in areas as diverse as the energy sector, insurance, military, air and water quality monitoring, weather, and aerospace industries. It will provide a solid foundation for advanced degrees in the atmospheric and oceanic sciences, and for professions in scientific research and academia.

ATOC's curriculum responds to demands of current students for more interactive learning opportunities and to demands of employers for graduates who have been trained to provide quantitative solutions to real-world problems. It is designed to provide students with a core set of knowledge and skills related to atmospheric and oceanic sciences, and to engage students in hands-on, interactive learning early and often.

To that end, it requires students to take several "methods" courses that emphasize quantitative problem-solving by focusing on some combination of data analysis, observations, and/or modeling; all of these courses will incorporate some level of computer programming or scientific computing. ATOC strongly recommends that every student have a laptop computer if it is financially feasible. Students who intend to purchase a computer and wish to have its cost included in their financial aid calculations are strongly encouraged to consult the Office of Financial Aid before purchase.

ATOC's curriculum is also designed to take advantage of our unique position as a university in the center of a world-renowned mecca for earth system science. Scientists from the local community contribute their expertise to the ATOC curriculum, particularly in the interactive methods courses, and mentor seniors in their thesis research.

Contact Information

The ATOC undergraduate advisor is:
Professor John Cassano
Office: SEEC C279
Email: john.cassano@colorado.edu

Academic Advising Center:
Jason Shelton
Email: jason.shelton@colorado.edu
Phone: 303-492-6508

For further information concerning undergraduate studies, contact ATOC's Graduate and Undergraduate Program Assistant Laurie Conway (laurie.conway@colorado.edu).

Requirements

Students receiving a BA in Atmospheric and Oceanic Sciences (ATOC) must satisfy the basic requirements of the College of Arts and Sciences (MAPS, Core Curriculum and credits) and fulfill the requirements listed below.

Students are required to complete 45 credit hours in lower and upper division ATOC coursework, including 21 hours of core ATOC courses, 12 hours of methods in ATOC, and 12 hours of designated upper-division ATOC electives. The requirements for the ATOC major also include 32-34 hours of ancillary science and mathematics. All required major courses and all required ancillary courses must be passed with a C- or better.

Under normal circumstances, no more than 45 credit hours in ATOC may be used toward a student's total University of Colorado graduation requirements. However, up to 6 hours of designated department honors courses are exempted from this credit hour maximum. Students must have a grade point average of at least 2.00 in the major in order to graduate.

Atmospheric and Oceanic Sciences major requirements

Ancillary Science and Math Requirements (C- or better required).

The field of atmospheric and oceanic sciences is highly interdisciplinary; therefore, students must develop a basic understanding of physics, chemistry, and mathematics to be successful. The required courses in the physical sciences and math departments outside of ATOC are a critical part of the major; they are needed to build a strong foundation upon which the remaining curriculum is based.

APPM 1350 Calculus 1 for Engineers

4-5

	or MATH 1300 Calculus 1	
APPM 1360	Calculus 2 for Engineers	4-5
	or MATH 2300 Calculus 2	
PHYS 1110	General Physics 1	4
PHYS 1120	General Physics 2	4
CHEM 1113	General Chemistry 1	4
APPM 2350	Calculus 3 for Engineers	4
	or MATH 2400 Calculus 3	
APPM 2360	Introduction to Differential Equations with Linear Algebra (Or MATH 3130 and MATH 3430)	4-6
CSCI 1300	Computer Science 1: Starting Computing	4
<i>Introductory Atmospheric and Oceanic Sciences Requirement (One of the following):</i>		
ATOC 1050	Weather and the Atmosphere	3
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate	3
FYSM 1000	First Year Seminar (Stratospheric Explorations)	3
<i>Core Atmospheric and Oceanic Sciences Requirements (3 of the following courses)</i>		
ATOC 3050	Principles of Weather	3
ATOC/GEOL 3070	Introduction to Oceanography	3
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution	3
ATOC 3600	Principles of Climate	3
<i>Fundamentals of Atmospheric and Oceanic Sciences (3 of the following courses)</i>		
ATOC 4200	Biogeochemical Oceanography	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Physical Oceanography and Climate)	3
ATOC 4710	Introduction to Atmospheric Physics	3
ATOC 4720	Introduction to Atmospheric Dynamics	3
<i>Methods in Atmospheric and Oceanic Sciences (12 credit hours of the following, 6 of which can be from independent research (4900 or 4950)).</i>		
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Scientific Programming and Data Visualization)	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Instrument Lab)	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Remote Sensing)	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Field Observations and Measurements)	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Numerical Methods and Modeling)	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Objective Data Analysis)	3
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences (Applications of Numerical Models)	3
ATOC 4700	Weather Analysis & Forecasting	3
ATOC 4900	Independent Study	1-3
ATOC 4950	Honors Thesis	1-3

ATOC Upper-Division Electives (12 credit hours in ATOC not used to fulfill a requirement above; all courses offered as ATOC 4500 "Special Topics" will satisfy this requirement) 12

Graduating in Four Years - Sample Curriculum

Not all ATOC 4500 courses satisfy all requirements. See department for more information.

Course	Title	Credit Hours
Year One		
Fall Semester		
FYSM 1000 or ATOC 1050 or ATOC 1060	First Year Seminar (ATOC section) or Weather and the Atmosphere or Our Changing Environment: El Nino, Ozone, and Climate	3
APPM 1350 or MATH 1300	Calculus 1 for Engineers or Calculus 1	4-5
PHYS 1110	General Physics 1	4
A&S CORE COURSE: Skills Acquisition (ex: Lower-Division Written Communication)		3
		Credit Hours 14-15
Spring Semester		
APPM 1360 or MATH 2300	Calculus 2 for Engineers or Calculus 2	4-5
PHYS 1120	General Physics 2	4
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)		3
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)		3
		Credit Hours 14-15
Year Two		
Fall Semester		
CHEM 1113	General Chemistry 1	4
CHEM 1114	Laboratory in General Chemistry 1	1
APPM 2350 or MATH 2400	Calculus 3 for Engineers or Calculus 3	4
ATOC core course: select one of the following		3

ATOC 3050 or ATOC 3070 or ATOC 3500 or ATOC 3600	Principles of Weather or Introduction to Oceanography or Air Chemistry and Pollution or Principles of Climate	3
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)		3
		Credit Hours 15
Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
ATOC core course: select two of the following for a total of 6 credit hours		6
ATOC 3050 or ATOC 3070 or ATOC 3500 or ATOC 3600	Principles of Weather or Introduction to Oceanography or Air Chemistry and Pollution or Principle of Climate	3
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)		3
CSCI 1300	Computer Science 1: Starting Computing	4
		Credit Hours 17
Year Three		
Fall Semester		
ATOC fundamentals course: take two of the following for a total of 6 credit hours		6
ATOC 4200 or ATOC 4710 or ATOC 4720 or ATOC 4500	Biogeochemical Oceanography or Introduction to Atmospheric Physics or Introduction to Atmospheric Dynamics or Special Topics in Atmospheric and Oceanic Sciences	3
ATOC Methods course: take one of the following		3

ATOC 4700 or ATOC 4900 or ATOC 4950 or ATOC 4500	Weather Analysis & Forecasting or Independent Study or Honors Thesis or Special Topics in Atmospheric and Oceanic Sciences	Credit Hours	3 15
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)			3
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)			3

Spring Semester

ATOC fundamentals course: take one of the following 3

ATOC 4200 or ATOC 4710 or ATOC 4720 or ATOC 4500	Biogeochem Oceanograph or Introduct to Atmospl Physics or Introduct to Atmospl Dynamic or Special Topics in Atmospl and Oceanic Sciences		3
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ATOC Methods course: take one of the following 3

ATOC 4700 or ATOC 4900 or ATOC 4950 or ATOC 4500	Weather Analysis & Forecasting or Independ Study or Honors Thesis or Special Topics in Atmospl and Oceanic Sciences		3
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ATOC Upper Division Elective	3
A&S CORE: Skills Acquisition (ex. Upper-Division Written Communication)	3
Elective Course	3
Credit Hours	15

Year Four

Fall Semester

ATOC Methods Course: take one of the following 3

ATOC 4700 or ATOC 4900 or ATOC 4950 or ATOC 4500	Weather Analysis & Forecasting or Independ Study or Honors Thesis or Special Topics in Atmospl and Oceanic Sciences	Credit Hours	3 15
ATOC Upper Division Elective			3
A&S CORE COURSE: Content Area of Study (see Degree Audit for options)			3
Elective Course			3
Elective Course			3

Spring Semester

ATOC Methods Course: take one of the following 3

ATOC 4700 or ATOC 4900 or ATOC 4950 or ATOC 4500	Weather Analysis & Forecasting or Independent Study or Honors Thesis or Special Topics in Atmospheric and Oceanic Sciences		3
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ATOC Upper Division Elective	3
ATOC Upper Division Elective	3
Elective Course	3
Elective Course	3
Credit Hours	15
Total Credit Hours	120-122

Atmospheric and Oceanic Sciences - Minor

The Department of Atmospheric and Oceanic Sciences (ATOC) offers an undergraduate minor for students pursuing a bachelor's degree in another academic department. Students who successfully complete a major at CU Boulder in a quantitative field, such as physics or chemistry, and a minor in ATOC, will be prepared for graduate work in atmospheric and oceanic sciences. The ATOC minor is offered through the College of Arts and Sciences and is noted on the official CU Boulder transcript.

Although the ATOC minor is primarily designed for students who are interested in developing a knowledge base in atmospheric and oceanic sciences with an emphasis on the earth's climate, there is considerable latitude within the minor program for students to design a course of study that is tailored to their individual interests.

Students who wish to declare the ATOC minor should contact the ATOC Undergraduate & Graduate Program Assistant by email at atocasst@colorado.edu or by phone at 303-492-6633. Questions regarding course work or advising should be directed to the ATOC minor advisor, Dr. John Cassano, at john.cassano@colorado.edu.

Requirements

A total of 18 credit hours is required for the minor, at least nine of which must be upper-division credit hours (see list below). The other 9 may be either lower-division, upper-division or a combination.

All course work applied to the minor must be completed with a grade of C- or better; no pass/fail work may be applied. Students must have at least a C (2.00) average for all attempted work in atmospheric and oceanic sciences.

Courses toward a minor may also be applied toward general requirements, like core and MAPS, as well as the major requirements for a non-ATOC major. Students are allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work to a minor.

Available Courses and Semester Credit Hours

Lower-Division

FYSM 1000	First Year Seminar (ATOC section)
ATOC 1050	Weather and the Atmosphere
ATOC 1060	Our Changing Environment: El Nino, Ozone, and Climate

Upper-Division

ATOC 3050	Principles of Weather
ATOC/GEOL 3070	Introduction to Oceanography
ATOC 3180	Aviation Meteorology
ATOC 3300	Analysis of Climate and Weather Observations
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution
ATOC/ ENVS 3600/ GEOG 3601	Principles of Climate
ATOC/ASTR 3720	Planets and Their Atmospheres
ATOC 4200	Biogeochemical Oceanography
ATOC/ASEN 4215	Descriptive Physical Oceanography
ATOC 4500	Special Topics in Atmospheric and Oceanic Sciences
ATOC 4550	Mountain Meteorology
ATOC 4700	Weather Analysis & Forecasting
ATOC 4710	Introduction to Atmospheric Physics
ATOC 4720	Introduction to Atmospheric Dynamics
ATOC 4750	Desert Meteorology and Climate
ATOC 4770	Wind Energy Meteorology
ATOC 4800	Policy Implications of Climate Controversies
ATOC 4900	Independent Study

British and Irish Studies

The Center for British and Irish Studies encourages students to develop programs that include a focus on British and Irish culture, history and

contemporary life from a variety of disciplinary perspectives. The center offers a certificate in British and Irish studies for students who have taken 24 credit hours in British and Irish literature, history and/or other fields.

For more information, contact the Center for British and Irish Studies at katherine.eggert@colorado.edu. For more information, go to www.colorado.edu/artssciences/british (<http://www.colorado.edu/artssciences/british>).

Certificate

- British and Irish Studies - Certificate (p. 221)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Eggert, Katherine (https://experts.colorado.edu/display/fisid_103618)
PhD, University of California-Berkeley

British and Irish Studies - Certificate

Undergraduates interested in the literature, history and culture of Britain and Ireland are encouraged to develop an interdisciplinary concentration in British and Irish studies. Completed in addition to a regular departmental major, this work will lead to a certificate in British and Irish studies. The certificate demonstrates that the student has done serious work in several aspects of British and Irish studies and will be advantageous when applying to graduate school or for jobs. It is open to students in any school or college.

Students will gain a diverse perspective of Britain. Upon successful completion of requirements, students will be awarded an official certificate in British and Irish studies, signed by the Director of the Center for British Studies and the Dean of Arts and Sciences. The certificate may be used by the student in applying for graduate school or employment, as evidence of a sustained interdisciplinary concentration in British and Irish Studies.

Requirements

A total of 24 credit hours in British and Irish studies (normally eight courses of 3 credit hours each) with a grade of C- or better in all classes.

The courses should be distributed as follows:

- In the department of primary focus (either English or history, depending on the student's own interests), any four courses in British or Irish studies. CBIS will provide a list of possible courses (see below).
- In the secondary department (either history, English or political science, depending upon primary area), a minimum of two courses and a maximum of four courses. CBIS will provide a list of possible courses (see below). Topics courses may be substituted with approval of the director.
- Students may take one or two courses in departments other than English, history or political science, chosen from the list below, in place of courses in the secondary department. Students are encouraged to do some work of an explicitly interdisciplinary nature such as team-taught courses offered by two departments or an independent study or honors thesis spanning two disciplines.

- Studying in Britain or Ireland would be a fine addition to the certificate. Contact the Office of International Education, Center for Community S355, 303-492-6016, for information on CU's Study Abroad programs.

Approved Courses

ECON 4514	Economic History of Europe	3
ENGL 1500	Masterpieces of British Literature	3
ENGL 2503	British Literary History to 1660	3
ENGL 2504	British Literary History after 1660	3
ENGL 2767	Survey of Post-Colonial Literature	3
ENGL 3000	Shakespeare for Nonmajors	3
ENGL 3068	Literature in English, 1900-1945	3
ENGL 3078	Literature in English, 1945-Present	3
ENGL 3164	History and Literature of Georgian Britain	3
ENGL 3523	The Renaissance in England, 1500-1600	3
ENGL 3533	The Renaissance in England, 1600-1700	3
ENGL 3544	The Restoration and the Eighteenth Century	3
ENGL 3553	Geoffrey Chaucer	3
ENGL 3563	Shakespeare	3
ENGL 3564	Romanticism	3
ENGL 3573	Shakespeare in Performance	3
ENGL 3583	Milton	3
ENGL 3604	The Victorian Era	3
ENGL 4003	Introduction to Old English	3
ENGL 4113	History and Culture of Medieval England	3
ENGL 4048	Modern British and Irish Novel	3
ENGL 4513	British Medieval Literature	3
ENGL 4514	Advanced Topics: The Restoration and the Eighteenth Century	3
ENGL 4524	Advanced Topics: Romanticism	3
ENGL 4583	Elizabeth I and Her Times	3
ENGL 4624	Transnational/Historic/Interdiscipline Approaches 1660-1900	3
ENGL 4634	Advanced Topics: The Victorian Era	3
ENGL 4693	Advanced Topics in British Literature to 1660	3
HIST 1113	Introduction to British History to 1660	3
HIST 1123	Introduction to British History Since 1660	3
HIST 3113	Seminar in Medieval and Early Modern English History	3
HIST 3133	Seminar in Britain since 1688	3
HIST 4013	Law and Society in Premodern England to 1688	3
HIST 4053	Britain and the Empire, 1688-1964	3
WGST 4063	Women in Victorian England	3
HIST 4083	Revolution and Nationalism in Modern Ireland	3
HIST 4123	Medieval England	3
HIST 4125	Early American History to 1763	3
HIST 4133	The Tudors: British History 1485-1603	3
HIST 4143	The Making of Great Britain: British History 1603-1714	3
HIST 4153	Emergence of Modern Britain, 1688-1851	3
HIST 4339	Borderlands of the British Empire	3
HIST 4349	Decolonization of the British Empire	3
PSCI 2004	Survey of Western Political Thought	3

PSCI 3074	Democracy and Its Citizens in the US and EU	3
PSCI 4002	Western European Politics	3
PSCI 4213	Europe and the International System	3
PSCI 4302	European Union Politics	3

Central and East European Studies

The Central and East European Studies certificate offers students the opportunity for the integrated, interdisciplinary study of the history, politics, language, literature, and culture of Russia, Central and Eastern Europe.

The program serves to foster new knowledge and understanding of Central and Eastern Europe, and to train a new generation by providing the knowledge, tools, and experience necessary for understanding these societies and for playing productive roles in their reconstruction.

The program offers students a broad understanding of the cultures and societies of Central and Eastern Europe for which it draws upon the expertise of faculty from a variety of campus departments.

Course code for this program is CEES.

Certificate

- Central and East European Studies - Certificate (p. 222)

CEES 1626 (3) Introduction to Central and East European History since 1770

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1626

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Arts Sciences Special Courses

Central and East European Studies - Certificate

Students who seek in-depth, interdisciplinary knowledge of the region are encouraged to pursue the certificate in central and east European studies (CEES). The certificate program offers students the opportunity to explore the culture, history and politics of the nations of central and eastern Europe from a variety of disciplinary perspectives.

The purpose of the certificate program is to enhance, rather than to replace, the department major. Students work with CEES faculty advisors to plan an appropriate certificate program. The certificate is awarded in addition to a bachelor's degree in another field.

Contact the director of Central and East European Studies, Professor Laura Osterman (laura.osterman@colorado.edu), at 303-492-7729 for additional information.

Requirements

The certificate program involves 24 credit hours, including an introductory course (CEES 1626/HIST 1626) and at least one course from each of three core clusters (historical, social science and literature/culture). Five (15 hours) of the eight courses (24 hours) must be at the

upper division level. Students pursuing the CEES certificate are strongly encouraged to take advantage of a recognized study abroad program in eastern Europe affiliated with CU Boulder. Courses taken in such a program, as approved by an advisor, count toward the certificate in CEES. Only 9 credits that apply to a student's major or minor can be used to fulfill requirements for the CEES certificate.

Chemistry and Biochemistry

The undergraduate degrees in chemistry and biochemistry emphasize knowledge and awareness of:

- the basic principles of chemistry—atomic and molecular theory, reactivities and properties of chemical substances and the states of matter;
- the basic subfields of chemistry—organic, physical, analytical and inorganic chemistry (and biochemistry for biochemistry majors);
- mathematics sufficient to facilitate the understanding and derivation of fundamental relationships and to analyze and manipulate experimental data;
- the basic principles of physics (and for biochemistry majors, knowledge of biology); and
- safe chemical practices, including waste handling and safety equipment.

In addition, students completing a degree in chemistry or biochemistry are expected to acquire the ability and skills to:

- read, evaluate and interpret information on a numerical, chemical and general scientific level;
- assemble experimental chemical apparatus, design experiments and use appropriate apparatus to measure chemical composition and properties (for biochemistry students, this includes properties of proteins, nucleic acids and other biochemical intermediates); and
- communicate results of scientific inquiries verbally and in writing.

Course code for this program is CHEM.

Bachelor's Degrees

- Biochemistry - Bachelor of Arts (BA) (p. 229)
- Chemistry - Bachelor of Arts (BA) (p. 231)

Minors

- Biochemistry - Minor (p. 231)
- Chemistry - Minor (p. 233)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahn, Natalie (https://experts.colorado.edu/display/fisid_106044)
Professor; PhD, University of California-Berkeley

Anseth, Kristi S (https://experts.colorado.edu/display/fisid_103471)
Distinguished Professor; PhD, University of Colorado Boulder

Asirvatham, Margaret (https://experts.colorado.edu/display/fisid_103670)
Senior Instructor; PhD, Kansas State University of Agriculture and App Sci

Batey, Robert T. (https://experts.colorado.edu/display/fisid_122668)
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Birks, John W.
Professor Emeritus

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Cameron, Jeffrey Carlyle (https://experts.colorado.edu/display/fisid_156473)
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Distinguished Professor; PhD, Northwestern University

Cech, Thomas R (https://experts.colorado.edu/display/fisid_103252)
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Copley, Shelley (https://experts.colorado.edu/display/fisid_104067)
Professor; PhD, Harvard University

Damrauer, Niels Harley (https://experts.colorado.edu/display/fisid_129797)
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Professor; PhD, California Institute of Technology

Goodrich, James Andrew (https://experts.colorado.edu/display/fisid_109239)
Professor; PhD, Carnegie Mellon University

Gough, Raina V (https://experts.colorado.edu/display/fisid_149207)
Instructor

Hendrickson, Susan Marie (https://experts.colorado.edu/display/fisid_145101)
Senior Instructor; PhD, Colorado State University

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Distinguished Professor; PhD, Princeton University

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Professor; PhD, Massachusetts Institute of Technology

Jonas, David (https://experts.colorado.edu/display/fisid_107145)
Professor; PhD, Massachusetts Institute of Technology

Koch, Tad H.
Professor Emeritus; PhD, Iowa State University

Koval, Carl A (https://experts.colorado.edu/display/fisid_101151)
Professor; PhD, California Institute of Technology

Kuchta, Robert (https://experts.colorado.edu/display/fisid_100844)
Professor; PhD, Brandeis University

Kugel, Jennifer Franzen (https://experts.colorado.edu/display/fisid_109472)
Assoc Research Professor; PhD, University of Colorado Boulder

Lineberger, William Carl (https://experts.colorado.edu/display/fisid_101695)
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McHenry, Charles
Professor Emeritus; PhD, University of California, Santa Barbara

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Nesbitt, David (https://experts.colorado.edu/display/fisid_100333)

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Parker, Roy Robert (https://experts.colorado.edu/display/fisid_151440)
Professor; PhD, University of California-San Francisco

Parson, Robert (https://experts.colorado.edu/display/fisid_101032)
Professor; PhD, University of Michigan Ann Arbor

Peters, Kevin
Professor Emeritus

Pierpont, Cortlandt G.
Professor Emeritus; PhD, Brown University

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Professor; PhD, Yale University

Schnizer-Luger, Karoline (https://experts.colorado.edu/display/fisid_156579)
Professor; PhD, Univ of Basel (Switzerland)

Schwartz, Daniel K. (https://experts.colorado.edu/display/fisid_118479)
Professor; PhD, Harvard University

Sievers, Robert E (https://experts.colorado.edu/display/fisid_102866)
Professor; PhD, University of Illinois at Urbana-Champaign

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Professor; PhD, University of Minnesota Twin Cities

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Professor; PhD, Univ of Buenos Aires (Argentina)

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Assistant Professor; PhD, Massachusetts Institute of Technology

Stephen, Ricardo Hugh (https://experts.colorado.edu/display/fisid_145994)
Instructor; PhD, University of Colorado Boulder

Taatjes, Dylan J (https://experts.colorado.edu/display/fisid_102436)
Associate Professor; PhD, University of Colorado Boulder

Tan, Zhongping (https://experts.colorado.edu/display/fisid_149809)
Assistant Professor; PhD, Columbia University In the City of New York

Tolbert, Bert Mills
Professor Emeritus

Tolbert, Margaret A (https://experts.colorado.edu/display/fisid_104976)
Distinguished Professor; PhD, California Institute of Technology

Uhlenbeck, Olke C (https://experts.colorado.edu/display/fisid_102471)
Professor Adjunct; PhD, Harvard University

Vaida, Veronica (https://experts.colorado.edu/display/fisid_100313)
Professor; PhD, Yale University

Volkamer, Rainer (https://experts.colorado.edu/display/fisid_144988)
Associate Professor; PhD, Univ of Heidelberg (Germany)

Walba, David M (https://experts.colorado.edu/display/fisid_105830)
Professor; PhD, California Institute of Technology

Walczak, Maciej Andrzej (https://experts.colorado.edu/display/fisid_153323)
Assistant Professor; PhD, University of Pittsburgh

Wang, Xiang (https://experts.colorado.edu/display/fisid_145812)
Associate Professor; PhD, Boston University

Weber, Jorg Mathias (https://experts.colorado.edu/display/fisid_142930)
Associate Professor; PhD, Univ of Kaiserslautern (Germany)

Wuttke, Deborah S (https://experts.colorado.edu/display/fisid_108412)
Professor; PhD, California Institute of Technology

Yin, Hang Hubert (https://experts.colorado.edu/display/fisid_144763)
Associate Professor; PhD, Yale University

Zhang, Wei (https://experts.colorado.edu/display/fisid_146429)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Ziemann, Paul Jeffrey (https://experts.colorado.edu/display/fisid_153281)

Professor; PhD, Pennsylvania State University Central Office

CHEM 1011 (3) Environmental Chemistry 1

Lect. Introduces basic principles of chemistry with applications to current environmental issues including toxic chemicals, air and water pollution, energy sources and their environmental impact, and climate change resulting from the greenhouse effect. No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Chemistry

MAPS Course: Physics

CHEM 1021 (4) Introductory Chemistry

Lect. and lab. For students with no high school chemistry or a very weak chemistry background. Remedies a deficiency in natural science MAPS requirements and prepares students for CHEM 1113 and CHEM 1114.

No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher. Department enforced prerequisite: one year high school algebra or concurrent enrollment in MATH 1011.

Additional Information: GT Pathways: GT-SC1 - Natural Physicl Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

CHEM 1031 (4) Environmental Chemistry 2

Lect. and lab. Applications of chemical principles to current environmental issues including acid rain, stratospheric ozone depletion, the Antarctic ozone hole, solar energy conversion and fuel cells, and the environmental consequences of nuclear war. Laboratory experience is included. No credit given to chemistry or biochemistry majors this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

Requisites: Requires prerequisite course of CHEM 1011 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

CHEM 1113 (4) General Chemistry 1

Lect., rec. Intended for first-semester students whose academic plans require advanced work in chemistry. Subjects: components of matter, stoichiometry, classes of reactions, gases, thermochemistry, atomic structure, electron configuration, chemical bonding, molecular shapes, covalent bonding, organic compounds, intermolecular forces, equilibrium. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021.

Department enforced corequisite: CHEM 1114. Not open to engineering students with exception of EPEN majors.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1400 or CHEM 1221 or CHEN 1211

Requisites: AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

CHEM 1114 (1) Laboratory in General Chemistry 1

Lab. Intended for first-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1113. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisites: CHEM 1113. Not open to engineering students with exception of EPEN majors.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1400 or CHEM 1221 or CHEN 1211

Requisites: AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

Additional Information: GT Pathways: GT-SC1 - Natural Physicl Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

CHEM 1133 (4) General Chemistry 2

Lect., rec. Intended for second-semester students whose academic plans require advanced work in chemistry. Subjects: acid-base equilibria, buffers and titrations, thermodynamics, redox reactions, electrochemistry, transition elements and their coordination compounds, solubility/solubility equilibria, crystal field theory, kinetics, nuclear chemistry. Department enforced corequisite: CHEM 1134.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 2100

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

CHEM 1134 (1) Laboratory in General Chemistry 2

Lab. Intended for second-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1133. Department enforced corequisite: CHEM 1133.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 2100

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physicl Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

CHEM 1221 (1) Engineering General Chemistry Lab

Meets general chemistry laboratory requirement for engineering students. Designed to illustrate chemical concepts and introduce basic techniques in chemical measurement and synthesis. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra; B- in CHEM 1021 recommended.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1113 or CHEM 1114 or CHEM 1400

Requisites: Requires prerequisite course of CHEN 1211 or CHEM 1133 (minimum grade C-), or corequisite course of CHEN 1211 or CHEM 1133. Restricted to undergraduate engineering students only.

CHEM 1400 (4) Foundations of Chemistry

Covers core concepts in chemistry: nature of matter (atomic and molecular structure, bonding and macroscopic properties), transformations of matter (chemical reactivity), and quantifying chemical transformations (thermochemistry, thermodynamics and kinetics). Emphasizes critical thinking and cultivate core problem solving skills utilized by scientists. Intended for first semester CHEM/BCHM majors. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grade C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1401. Formerly CHEM 1251.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1113

Requisites: Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

CHEM 1401 (1) Foundations of Chemistry Lab

Coordinates with lecture topics in CHEM 1400. Intended for first-semester CHEM and BCHM majors. Emphasizes the development of hands-on practical laboratory skills, experimental design, data interpretation, problem solving and open inquiry. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grade C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1400.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1114 or CHEM 1400

Requisites: Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Lab

CHEM 2100 (4) Chemical Energetics and Dynamics

Covers the energetic principles that determine when chemical reactions occur and the dynamic principles that determine how rapidly they will occur. Applications include ionic equilibria in solution (acids and bases, buffers and titrations), oxidation-reduction reactions, electrochemistry and chemical kinetics. These applications will be situated in a context of current research problems in areas such as renewable energy and atmospheric chemistry. Department enforced corequisite: CHEM 2101. Formerly CHEM 1271.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1133

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and MATH 2300 or APPM 1360 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Lab

CHEM 2101 (1) Laboratory for Chemical Energetics and Dynamics

Coordinates with the lectures topics in CHEM 2100. Required for fourth semester CHEM majors and an elective for BCHEM majors. Emphasizes the acquisition of more advanced laboratory skills, experimental design, data interpretation and analysis. Department enforced corequisite: CHEM 2100.

Requisites: Requires a prerequisite course of CHEM 3341 or CHEM 3381 (minimum grade C-).

Grading Basis: Letter Grade

CHEM 3151 (3) Air Chemistry and Pollution

Examines the composition of the atmosphere, and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion. Department enforced prerequisite: two semesters of chemistry.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3500

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

CHEM 3251 (3) Sustainable Energy from a Chemistry Perspective

Explores qualitative and quantitative chemical aspects of energy systems (production, transmission, storage, utilization) including fossil, wind, solar, nuclear and biomass energy. Applies chemical principles including composition, structure, bonding, physical properties, thermodynamics, equilibrium and kinetics to energy systems and sustainability, especially environmental implications. Describes the importance of energy to the chemical industries and society as a whole.

Requisites: Requires prerequisite course of CHEM 1133 and 1134 or CHEM 2100 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

CHEM 3311 (4) Organic Chemistry 1

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkanes, alkenes, alkynes, alkyl halides, and aromatic molecules; nomenclature of organic compounds; stereochemistry; reaction mechanisms and dynamics. Department enforced corequisite: CHEM 3321 or CHEM 3361.

Requisites: Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 1400 and CHEM 1401 or CHEM 2100 (formerly CHEM 1271) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

CHEM 3321 (1) Laboratory in Organic Chemistry 1

Lab. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, and aromatic compounds. Stereochemical modeling and the identification of organic unknowns by spectroscopic and chemical methods are also introduced. Department enforced corequisite: CHEM 3311 or CHEM 3451.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3361

Requisites: Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

CHEM 3331 (4) Organic Chemistry 2

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkyl halides, alcohols, ethers, carboxylic acids, aldehydes, ketones, and amines; introduction to the chemistry of heterocycles, carbohydrates, and amino acids; nomenclature of organic compounds; synthesis; and reaction mechanisms. Department enforced corequisite: CHEM 3341 or CHEM 3381.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3471 (formerly CHEM 3371) or CHEM 3491

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3351 and CHEM 3321 or CHEM 3361 (all minimum grade C-).

CHEM 3341 (1) Laboratory in Organic Chemistry 2

Lab. For biochemistry and nonchemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing reactions involving alcohols, ketones, carboxylic acids, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-).

CHEM 3361 (2) Laboratory in Organic Chemistry 1 for Chemistry Majors

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, alcohols, ketones, and alkyl halides. Explores stereochemical modeling and the chemical identification of organic unknowns. Department enforced corequisite: CHEM 3351 or CHEM 3311 or CHEM 3451.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3321

Requisites: Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEM 1211 and CHEM 1221 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 3381 (2) Laboratory in Organic Chemistry 2 for Chemistry Majors

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern chemistry, emphasizing reactions involving alcohols, ketones, carboxylic acids, aromatic compounds, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 3451 (4) Organic Chemistry for Chemistry and Biochemistry Majors

Covers bonding, acidity, reaction mechanisms, nomenclature of organic compounds; stereochemistry; structure and reactions of aldehydes, ketones, and carboxylic acids and derivatives. Department enforced corequisite: CHEM 3361 or CHEM 3321.

Requisites: Requires prerequisite courses of CHEM 1400 and CHEM 1401 (minimum grade C-) or CHEM 1133 and CHEM 1134 (minimum grade B+). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 3471 (4) Organic Chemistry 2 for Chemistry Majors

Covers Amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity, and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanisms. Department enforced corequisite: CHEM 3381 or CHEM 3341. Formerly CHEM 3371.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3331 and CHEM 3491

Requisites: Requires prerequisite courses of CHEM 3451 and CHEM 3361 or CHEM 3321 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 3491 (4) Organic Chemistry 2 for Biochemistry Majors

Covers amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanism. Department enforced corequisite: CHEM 3341 or CHEM 3381.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3471 (formerly CHEM 3371) and CHEM 3331

Requisites: Requires prerequisite courses of CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 4011 (3) Modern Inorganic Chemistry

Lect. Required course for chemistry majors. Introduces modern inorganic chemistry for undergraduates. Includes atomic structure, chemical periodicity, structure and bonding in molecules and crystals, reaction mechanisms, chemistry of selected main group and transition elements, and emphasis on catalyst, materials, bioinorganic, and organometallic systems.

Requisites: Requires a prerequisite course of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4021 (3) Inorganic Laboratory

One lect. and two 3-hour labs per week. Instruction in experimental techniques of modern inorganic chemistry. Includes syntheses and spectroscopic characterizations of transition metal and main group compounds, experience in manipulation of air sensitive compounds, and techniques involving unusual conditions of pressure or temperature.

Requisites: Requires prerequisite course of CHEM 4011 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4131 (3) Chemistry of Global Health

Understanding the chemistry associated with health care in resource-poor countries is the objective of this course. Focuses on preventing, diagnosing and treating the world's deadliest infectious diseases with a particular emphasis on Africa and Central America.

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and EBIO 1210 or MCDB 1150 (all minimum grade C-).

CHEM 4141 (3) Environmental Water and Soil Chemistry

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5141

Requisites: Requires prerequisite course of CHEM 2100 or CHEM 1133 and CHEM 1134 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

CHEM 4171 (3) Instrumental Analysis - Lecture and Laboratory 1

Two Lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis to address problems in chemistry, biochemistry, industrial chemistry and environmental chemistry.

Requisites: Requires prerequisite course of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and CHEM 3341 or CHEM 3381 and PHYS 1140 or CHEM 4400 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 4181 (3) Instrumental Analysis - Lecture and Laboratory 2

Two lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis. Builds on material learned in CHEM 4171.

Requisites: Requires prerequisite course of CHEM 4171 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 4251 (3) Materials Chemistry and Properties

Lect. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5251

Requisites: Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4521 or CHEM 4531 (all minimum grade C-).

CHEM 4261 (3) Organic Materials: Structures and Functions

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5261

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

CHEM 4271 (3) Chemistry of Solar Energy

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5271

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

CHEM 4400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Department enforced prerequisite or corequisite: PHYS 1120 or PHYS 2020. Formerly CHEM 4411.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5400 and CHEM 4511

Requisites: Requires prerequisite courses CHEM 3331 or CHEM 3471 or CHEM 3491 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 (all minimum grade C-).

CHEM 4491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies. Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5491

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 and CHEM 4400 (formerly CHEM 4411) or CHEM 4511 or corequisite of CHEM 4400 or CHEM 4511 (all minimum grade C).

Grading Basis: Letter Grade

CHEM 4511 (3) Physical Chemistry 1

Lect. Chemical thermodynamics and kinetics. Includes study of laws of thermodynamics, thermochemistry, entropy, free energy, chemical potential, chemical equilibria, and the rates and mechanisms of chemical reactions. Department enforced prereq or coreq., PHYS 1120 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4400 and CHEM 5400

Requisites: Requires prerequisite of courses CHEM 3311 or CHEM 3451 and MATH 2400 or APPM 2350 and PHYS 1110 or PHYS 2020 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4531 (3) Physical Chemistry 2

Lect. Introduces the quantum theory of atoms, molecules and chemical bonding, and statistical thermodynamics. Includes principles of quantum mechanics and their application to atomic structure, molecular spectroscopy, symmetry properties, and the determination of molecular structure. Also includes principles of statistical mechanics and their applications to properties of gases, liquids, and solids.

Requisites: Requires prerequisite courses of CHEM 4511 and PHYS 1120 or PHYS 2020, and MATH 2400 or APPM 2350 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4555 (4) Theoretical and Computational Chemistry

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations. Not recommended for students with a grade below B- in the prerequisite course.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5555

Requisites: Requires prerequisite course of CHEM 4531 (minimum grade C-).

Grading Basis: Letter Grade

CHEM 4581 (1) Physical Chemistry Lab 1

One 3-hour lab per week. Instruction in experimental techniques of modern physical chemistry. Experiments illustrate the fundamental principles of thermodynamics and chemical kinetics. Illustrates the material discussed in CHEM 4511.

Requisites: Requires prerequisite or corequisite course of CHEM 4511 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4591 (2) Physical Chemistry Lab 2

One lect. and one 3-hour laboratory every two weeks. a continuation of CHEM 4581, but may be taken concurrently with CHEM 4531. Experiments illustrate the principles of quantum chemistry and spectroscopy discussed in CHEM 4531.

Requisites: Requires prerequisite courses of CHEM 4511 and CHEM 4581 (all minimum grade C-). Requires prerequisite or corequisite course of CHEM 4531 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4611 (3) Survey of Biochemistry

Lect. One-semester survey of the main themes of modern biochemistry: biomolecular structure/function, metabolism, biosynthesis, DNA from genome to proteome and cellular signaling. For biology and engineering majors and others wanting a survey of biochemistry.

Requisites: Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-).

CHEM 4621 (3) Genome Databases: Mining and Management

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure. Department enforced corequisite: CSCI 2270.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4621 or MCDB 5621 CHEM 5621

Requisites: Requires prerequisite course of CHEM 4700 or CSCI 3104 or MCDB 3500 (minimum grade C-).

CHEM 4700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of organic and physical chemistry will be required. Formerly CHEM 4711.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5700

Requisites: Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 (minimum grade C-).

Grading Basis: Letter Grade

CHEM 4720 (4) Metabolic Pathways and Human Disease

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5720

Requisites: Requires a prerequisite course of CHEM 4700 (formerly CHEM 4711; minimum grade C-).

CHEM 4740 (4) Biochemistry of Gene Transmission, Expression and Regulation

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5740

Requisites: Requires a prerequisite course of CHEM 4700 (formerly CHEM 4711; minimum grade C-).

CHEM 4751 (3) Current Topics in Biochemical Research

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5751

Requisites: Requires prerequisite courses of CHEM 4700 and CHEM 4740 or MCDB 3135 (all minimum grade C-).

CHEM 4761 (4) Biochemistry Laboratory

Two 5-hour periods per week. The first hour of each period is lecture, the remainder is laboratory. Introduction to modern biochemical techniques. Topics include enzymology, spectrophotometry, electrophoresis affinity chromatography, radioisotopes, recombinant DNA, and molecular cloning.

Requisites: Requires a prerequisite course of CHEM 4700 (formerly CHEM 4711; minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4791 (3) Bioorganic Chemistry in Biotechnology

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5791

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and CHEM 4700 (minimum grade C-).

Recommended: Prerequisite undergraduate molecular biology.

CHEM 4901 (1-6) Independent Study in Chemistry and Biochemistry

For undergraduate study. Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Biochemistry - Bachelor of Arts (BA)

Biochemistry major students are prepared for many different careers after graduation. Career Services (<http://www.colorado.edu/careerservices>) offers a number of programs and services designed to help students plan their career, including workshops, internships, and placement services after graduation. For an appointment with a career counselor or for more information call 303-492-6541, or stop by Center for Community, N352.

Announcements

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- **Academic support:** SASC workshop schedule, tutors, and other academic support opportunities.
- **Career services:** schedule of events offered by this office.
- **Study abroad:** announcements from study abroad about their programs and information meetings.
- **Courses:** information about new and/or interesting courses for core and elective credit.

Research Opportunities

Undergraduate Research Opportunities Program (UROP and other opportunities)

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Learn to write proposals, conduct research, pursue creative work, analyze data and present the results. For more information, visit the UROP Website (<http://www.colorado.edu/suep/about-urop>).

Study Abroad

The experience of studying abroad can prove invaluable. For information about study abroad programs, visit the Office of International Education/ Study Abroad (<http://studyabroad.colorado.edu>) website.

Teaching Certification

Biochemistry majors can also earn certification as teachers through the School of Education. The program for a secondary school science-teaching certificate is challenging requiring a broad, strong background in science, as well as course work in education and practice teaching. It usually requires at least five years of study. Students interested in teacher certification are encouraged to contact the School of Education (<http://www.colorado.edu/education>).

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in Biochemistry, in addition to completing all the current requirements for the BA with a major in Biochemistry at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Requirements

The biochemistry major requires extensive course work, including courses in general, organic, physical and analytical/instrumental chemistry, as well as in biology, calculus and physics.

In addition to these requirements, students must fulfill the College of Arts and Sciences' core curriculum. The core curriculum covers three skills acquisition areas and seven content areas of study. Credits taken for the major may also apply toward these core hours.

Transfer students who plan to complete a BA degree in biochemistry must complete at the Boulder campus a minimum of 12 credit hours of upper-division courses in biochemistry covering at least 2 of the sub-disciplines in their major: organic, physical and biochemistry.

Students may want to consult each semester's Registration Handbook and Schedule of Courses (<http://www.colorado.edu/registrar>) as well as the Professor Performance Guide (<http://www.colorado.edu/pba/fcq>) for further information about course offerings and faculty.

Required Courses and Credit Hours

Required Major Courses

Select one of the following general chemistry sequence options: 5-10

Option 1

CHEM 1400 Foundations of Chemistry
& CHEM 1401 and Foundations of Chemistry Lab

Option 2

CHEM 1113 General Chemistry 1
& CHEM 1114 and Laboratory in General Chemistry 1

CHEM 1133 General Chemistry 2
& CHEM 1134 and Laboratory in General Chemistry 2

Select one of the following organic chemistry options: 10-12

Option 1

CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
& CHEM 3361 Majors
and Laboratory in Organic Chemistry 1 for
Chemistry Majors

CHEM 3491 Organic Chemistry 2 for Biochemistry Majors
& CHEM 3381 and Laboratory in Organic Chemistry 2 for
Chemistry Majors

Option 2

CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
& CHEM 3361 Majors
and Laboratory in Organic Chemistry 1 for
Chemistry Majors

CHEM 3471 Organic Chemistry 2 for Chemistry Majors
& CHEM 3381 and Laboratory in Organic Chemistry 2 for
Chemistry Majors

Option 3

CHEM 3311 Organic Chemistry 1
& CHEM 3321 and Laboratory in Organic Chemistry 1

CHEM 3331 Organic Chemistry 2
& CHEM 3341 and Laboratory in Organic Chemistry 2

Select one of the following physical chemistry options: 4-6

Option 1

CHEM 4400 Core Concepts in Physical Chemistry for
Biochemists

Option 2

CHEM 4511 Physical Chemistry 1
& CHEM 4531 and Physical Chemistry 2

Other required chemistry course work:

CHEM 4700 Foundations of Biochemistry 4

CHEM 4720 Metabolic Pathways and Human Disease 4
or CHEM 4740 Biochemistry of Gene Transmission, Expression and
Regulation

CHEM 4761 Biochemistry Laboratory 4

Select three of the following elective courses: 9-12

CHEM 4720 Metabolic Pathways and Human Disease (if not
taken as a required major course)

CHEM 4740 Biochemistry of Gene Transmission, Expression
and Regulation (if not taken as a required major
course; cannot also count MCDB 3135 as a
required ancillary course)

CHEM 4751 Current Topics in Biochemical Research

CHEM 4791 Bioorganic Chemistry in Biotechnology

CHEM 4011 Modern Inorganic Chemistry

CHEM 4171 Instrumental Analysis - Lecture and Laboratory 1

CHEM 4181 Instrumental Analysis - Lecture and Laboratory 2

CHEM 5341 Chemical Biology and Drug Design

MCDB 3135 Molecular Cell Biology I (cannot also count
CHEM 4740 as a required ancillary course)

MCDB 3145 Molecular Cell Biology II

MCDB 3150 Biology of the Cancer Cell

MCDB 3501 Structural Methods for Biological Macromolecules

MCDB 3650 The Brain - From Molecules to Behavior

MCDB 3990 Introduction to Systems Biology for Biologists

MCDB 4310 Microbial Genetics and Physiology

MCDB 4410 Human Molecular Genetics

MCDB 4471 Mechanisms of Gene Regulation in Eukaryotes

MCDB 4520 Bioinformatics and Genomics

EBIO 2070 Genetics: Molecules to Populations (cannot also
count MCDB 2150 as a required ancillary course)

EBIO 3400 Microbiology

EBIO 4530 Functional Plant Biology

IPHY 3430 Introduction to Human Physiology

IPHY 3470 Human Physiology 1

IPHY 3480	Human Physiology 2	
Required ancillary course work from outside chemistry:		
<i>Required physics courses:</i>		
PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2	8
PHYS 1140	Experimental Physics 1	1
<i>Select one of the following calculus sequences:</i>		8-10
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	
APPM 1350 & APPM 1360	Calculus 1 for Engineers and Calculus 2 for Engineers	
<i>Select one of the following biology sequence options:</i>		8
<i>Option 1</i>		
MCDB 1150 & MCDB 1151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab	
MCDB 2150 & MCDB 2151	Principles of Genetics and Principles of Genetics Laboratory	
<i>Option 2</i>		
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	
Total Credit Hours		65-79

All students, and especially those intending to go onto graduate school in biochemistry, will benefit from additional advanced courses. Recommended electives include graduate courses in various fields of chemistry, or advanced courses in biology or mathematics.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain progress in chemistry and biochemistry, students should meet the following requirements:

- In the first semester, declare the biochemistry major.

Students must consult with a major advisor to determine adequate progress toward completion of the major.

Biochemistry - Minor

Minors are offered in chemistry and in biochemistry. Declaration of a biochemistry minor is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements

The College of Arts and Sciences will allow a maximum of 9 hours of transfer credit, including 6 upper-division credit hours to count toward a minor. Students may transfer courses through organic chemistry only. All courses required for the minor must be completed with a grade of C- or better, and the overall GPA in all CHEM courses taken must be a 2.00.

Students who have taken CHEN 1211 and CHEM 1221 may substitute them for CHEM 1113. Engineering students who have taken CHEN 4521 may NOT use this to satisfy the physical chemistry requirement.

Select one of the following two options: 5-10

Option 1:

CHEM 1113 General Chemistry 1
& CHEM 1114 and Laboratory in General Chemistry 1

CHEM 1133 General Chemistry 2
& CHEM 1134 and Laboratory in General Chemistry 2

Option 2:

CHEM 1400 Foundations of Chemistry
& CHEM 1401 and Foundations of Chemistry Lab

Select one of the following three options: 10-12

Option 1:

CHEM 3311 Organic Chemistry 1
& CHEM 3321 and Laboratory in Organic Chemistry 1

CHEM 3331 Organic Chemistry 2
& CHEM 3341 and Laboratory in Organic Chemistry 2

Option 2:

CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
Majors (and CHEM 3321 or CHEM 3361)

CHEM 3471 Organic Chemistry 2 for Chemistry Majors (and
CHEM 3341 or CHEM 3381)

Option 3:

CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
Majors (and CHEM 3321 or CHEM 3361)

CHEM 3491 Organic Chemistry 2 for Biochemistry Majors (and
CHEM 3341 or CHEM 3381)

Select one of the following: 3-4

CHEM 4400 Core Concepts in Physical Chemistry for
Biochemists

CHEM 4511 Physical Chemistry 1

Select one of the following: 3-8

CHEM 4611 Survey of Biochemistry

CHEM 4700 Foundations of Biochemistry
& CHEM 4720 and Metabolic Pathways and Human Disease

CHEM 4700 Foundations of Biochemistry
& CHEM 4740 and Biochemistry of Gene Transmission,
Expression and Regulation

Total Credit Hours

21-34

Chemistry - Bachelor of Arts (BA)

Chemistry major students are prepared for many different careers after graduation. About 50 percent of chemistry majors enter directly into industry or government positions that require scientific expertise, such as chemical, oil, electronics, mining and manufacturing industries, water districts, crime laboratories, biotechnology, health and safety, atmospheric science and environmental quality.

Approximately 25 percent of chemistry graduates are attracted by specialized graduate education in chemistry and biochemistry. Graduate work is often in one of the traditional areas of biochemistry or analytical, inorganic, organic or physical chemistry and, increasingly, in interdisciplinary areas such as atmospheric, bio-organic or organo-metallic chemistry, molecular biology, biotechnology and chemical physics for their advanced work. Another 25 percent of a typical graduating class goes on to professional school, pursuing advanced degrees in medicine, dentistry, pharmacy, law, business, engineering and computer science.

Career Services (<http://www.colorado.edu/careerservices>) offers a number of programs and services designed to help students plan their career, including workshops, internships, and placement services after graduation. For an appointment with a career counselor or for more information call 303 492 6541, or stop by Center for Community, N352.

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- **Study abroad:** announcements from study abroad about their programs and information meetings.
- **Courses:** information about new and/or interesting courses for core and elective credit.

Chemistry Honors Program

Opportunity is provided for qualified chemistry and biochemistry majors to participate in the departmental honors program and graduate with honors (*cum laude*, *magna cum laude*, or *summa cum laude*) in chemistry. Students interested in the honors program should contact the departmental honors advisor during their junior year.

American Chemical Society Certification

The American Chemical Society maintains a certification program in which a student graduating with a specified minimum program is certified to the society upon graduation. To be certified, a graduate must satisfy requirements in addition to the minimum for graduation. The department offers this certificate for the chemistry or chemistry/biochemistry double majors only. A list of these requirements may be obtained from the undergraduate chemistry and biochemistry advising office.

Research Opportunities

Undergraduate Research Opportunities Program

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Learn to write proposals, conduct research, pursue creative work, analyze data, and present the results. For more information please visit the Undergraduate Research Opportunities Program (<http://www.colorado.edu/suep/about-urop>) website. Visit Other Funding Opportunities (<http://www.colorado.edu/suep/urop/other-funding>) for a list of other funding opportunities for undergraduate students.

Independent Study

Independent study (CHEM 4901), provides an opportunity for a student to work on a research project with an individual faculty member outside of the regular class structure. This generally provides an experience much

more like real-life chemistry or biochemistry, where new results are being sought and the outcome of the research is not known in advance. The student may have a totally independent project or may become part of a research team working at the forefront of science. In favorable cases the project may result in publication of the results of the independent study in the scientific literature. As part of the research team in a particular group the student will usually participate in group seminars and informal discussions with other members of the group.

Study Abroad

The experience of studying abroad can prove invaluable. For information about study abroad programs, visit the Office of International Education/Study Abroad (<http://studyabroad.colorado.edu>) website.

Teaching Certification

Chemistry or biochemistry majors can also earn certification as teachers through the School of Education. The program for a secondary school science-teaching certificate is challenging requiring a broad, strong background in science, as well as course work in education and practice teaching. It usually requires at least five years of study. Students interested in teacher certification are encouraged to contact the School of Education (<http://www.colorado.edu/education>).

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in chemistry, in addition to completing all the current requirements for the BA with a major in chemistry at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Requirements

The chemistry major requires 30 credit hours of upper-division chemistry course work, including courses in general, organic, physical and analytical/instrumental chemistry, as well as an introductory general chemistry sequence and ancillary work in calculus and physics.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Transfer students who plan to take a chemistry major must complete at the Boulder campus a minimum of 12 credit hours of upper-division work covering at least two subdisciplines: organic, physical, analytical and inorganic for chemistry majors.

Students may want to consult each semester's Registration Handbook and Schedule of Courses (<http://www.colorado.edu/registrar>) as well as the Professor Performance Guide (<http://www.colorado.edu/pba/fcq>) for further information about course offerings and faculty.

Required Courses and Credit Hours

Required chemistry major courses

Select one of the following general chemistry sequence options: 10

Option 1:

CHEM 1400 & CHEM 1401	Foundations of Chemistry and Foundations of Chemistry Lab
CHEM 2100 & CHEM 2101	Chemical Energetics and Dynamics and Laboratory for Chemical Energetics and Dynamics

Option 2:CHEM 1113 General Chemistry 1
& CHEM 1114 and Laboratory in General Chemistry 1CHEM 1133 General Chemistry 2
& CHEM 1134 and Laboratory in General Chemistry 2*Select one of the following organic chemistry options:* 8**Option 1**CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
& CHEM 3471 Majors
and Organic Chemistry 2 for Chemistry Majors**Option 2**CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
& CHEM 3491 Majors
and Organic Chemistry 2 for Biochemistry Majors**Option 3**CHEM 3311 Organic Chemistry 1
& CHEM 3331 and Organic Chemistry 2**Other required chemistry course work:**CHEM 3361 Laboratory in Organic Chemistry 1 for Chemistry
& CHEM 3381 Majors
and Laboratory in Organic Chemistry 2 for
Chemistry Majors 4

CHEM 4011 Modern Inorganic Chemistry 3

CHEM 4171 Instrumental Analysis - Lecture and Laboratory 1 3

CHEM 4181 Instrumental Analysis - Lecture and Laboratory 2 3

CHEM 4511 Physical Chemistry 1
& CHEM 4581 and Physical Chemistry Lab 1 4CHEM 4531 Physical Chemistry 2
& CHEM 4591 and Physical Chemistry Lab 2 5**Chemistry electives**

All students, and especially those intending to go on to graduate school in chemistry, will benefit from additional advanced courses.

Recommended electives include the following:

CHEM 3151 Air Chemistry and Pollution

CHEM 3251 Sustainable Energy from a Chemistry Perspective

CHEM 4021 Inorganic Laboratory

CHEM 4141 Environmental Water and Soil Chemistry

CHEM 4251 Materials Chemistry and Properties

CHEM 4261 Organic Materials: Structures and Functions

CHEM 4271 Chemistry of Solar Energy

CHEM 4611 Survey of Biochemistry

CHEM 4700 Foundations of Biochemistry

CHEM 4720 Metabolic Pathways and Human Disease

CHEM 4740 Biochemistry of Gene Transmission, Expression
and Regulation

CHEM 4901 Independent Study in Chemistry and Biochemistry

Graduate courses in various fields of chemistry

Advanced courses in mathematics or physics

Required ancillary course work from outside chemistry:**Required physics courses:**PHYS 1110 General Physics 1
& PHYS 1120 and General Physics 2 8

PHYS 1140 Experimental Physics 1 1

Select one of the following calculus sequences: 12-14**Option 1:**

MATH 1300 Calculus 1

MATH 2300 Calculus 2

MATH 2400 Calculus 3

Option 2:

APPM 1350 Calculus 1 for Engineers

APPM 1360 Calculus 2 for Engineers

APPM 2350 Calculus 3 for Engineers

Total Credit Hours 61-63

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain progress in chemistry and biochemistry, students should meet the following requirements:

- In the first semester, declare the chemistry major.

Students must consult with a major advisor to determine adequate progress toward completion of the major.

Chemistry - Minor

Minors are offered in chemistry and in biochemistry. Declaration of a chemistry minor is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements

The College of Arts and Sciences will allow a maximum of 9 hours of transfer credit, including 6 upper-division credit hours, to count toward a minor. Students may only transfer courses through organic chemistry. All courses required for the minor must be completed with a grade of C- or better, and the overall GPA in all CHEM courses taken must be a 2.00.

Students who have taken CHEN 1211 and CHEM 1221 may substitute them for General Chemistry 1. Engineering students who have taken CHEN 4521 may NOT use this to satisfy the physical chemistry requirement.

Select one of the following two options: 5-10**Option 1:**CHEM 1113 General Chemistry 1
& CHEM 1114 and Laboratory in General Chemistry 1CHEM 1133 General Chemistry 2
& CHEM 1134 and Laboratory in General Chemistry 2**Option 2:**CHEM 1400 Foundations of Chemistry
& CHEM 1401 and Foundations of Chemistry Lab**Select one of the following three options:** 10-12**Option 1**CHEM 3311 Organic Chemistry 1
& CHEM 3321 and Laboratory in Organic Chemistry 1CHEM 3331 Organic Chemistry 2
& CHEM 3341 and Laboratory in Organic Chemistry 2**Option 2**CHEM 3451 Organic Chemistry for Chemistry and Biochemistry
Majors (and CHEM 3321 or CHEM 3361)

CHEM 3471	Organic Chemistry 2 for Chemistry Majors (and CHEM 3341 or CHEM 3381)	
<i>Option 3</i>		
CHEM 3451	Organic Chemistry for Chemistry and Biochemistry Majors (and CHEM 3321 or CHEM 3361)	
CHEM 3491	Organic Chemistry 2 for Biochemistry Majors (and CHEM 3341 or CHEM 3381)	
CHEM 4511	Physical Chemistry 1	3
Select one of the following:		3-4
CHEM 4531	Physical Chemistry 2	
CHEM 4011	Modern Inorganic Chemistry	
CHEM 4171	Instrumental Analysis - Lecture and Laboratory 1	
Total Credit Hours		21-29

Classics

Through consultation with the undergraduate advisor, the bachelor's degree in classics is tailored to the student's interests in the field. Major and minor programs can be arranged with a concentration in either Latin or Greek or a combination of the two, with a focus on classical literature, culture and thought (including mythology, literature, philosophy, religion, art, archaeology and history) or with a particular emphasis on classical history, art and archaeology. Prospective majors and minors should consult with the undergraduate advisor.

The undergraduate degree in classics emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Greek and Roman literature, from Homer to the end of classical antiquity;
- the historical and cultural contexts of particular works; and
- the art, religion and philosophy of ancient Greece and Rome and their roles in world cultural history.

In addition, students completing the degree in classics are expected to acquire the ability and skills to:

- read, understand and interpret written documents and works of literature in ancient Greek or Latin where relevant, as well as in translation;
 - communicate in spoken and written form with adequate clarity and complexity for the relevant audience; and
 - read and think critically.
- Interested students are encouraged to consult colorado.edu/classics/undergraduate (<http://classics.colorado.edu/undergraduate>) for more information.

Course codes for this program are CLAS, GREK and LATN.

Bachelor's Degree

- Classics - Bachelor of Arts (BA) (p. 240)

Minor

- Classics - Minor (p. 242)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ambrose, Kirk T (https://experts.colorado.edu/display/fisid_115914)
Professor; PhD, University of Michigan Ann Arbor

Atnally, Diane L (https://experts.colorado.edu/display/fisid_113062)
Associate Professor; PhD, University of Michigan Ann Arbor

Bailey, Dominic T. J. (https://experts.colorado.edu/display/fisid_145110)
Associate Professor; PhD, University of Cambridge (England)

Bruce, Scott (https://experts.colorado.edu/display/fisid_122945)
Professor; PhD, Princeton University

Cain, Andrew J (https://experts.colorado.edu/display/fisid_129296)
Associate Professor; PhD, Cornell University

Dusinberre, Elspeth Rogers Mcin (https://experts.colorado.edu/display/fisid_111649)
Professor; PhD, University of Michigan Ann Arbor

Elliott, Jacqueline Michelle (https://experts.colorado.edu/display/fisid_140085)
Associate Professor; PhD, Columbia University In the City of New York

Evjen, Harold D.
Professor Emeritus

Fredricksmeier, Ernst A.
Professor Emeritus

Gibert, John C (https://experts.colorado.edu/display/fisid_101680)
Associate Professor; PhD, Harvard University

Hunt, Peter (https://experts.colorado.edu/display/fisid_115394)
Professor; PhD, Stanford University

James, Sarah Anne (https://experts.colorado.edu/display/fisid_151713)
Assistant Professor; PhD, University of Texas at Austin

King, Joy K.
Professor Emeritus

Kopff, E Christian (https://experts.colorado.edu/display/fisid_100649)
Associate Professor; PhD, University of North Carolina Chapel Hill

Lansford, Edwin Tyler (https://experts.colorado.edu/display/fisid_147620)
Instructor

Lee, Mi-Kyoung (https://experts.colorado.edu/display/fisid_141821)
Associate Professor; PhD, Harvard University

Nakassis, Dimitri (https://experts.colorado.edu/display/fisid_154917)
Professor; PhD, University of Texas at Austin

Newlands, Carole E. (https://experts.colorado.edu/display/fisid_147504)
Professor

Pasnau, Robert C (https://experts.colorado.edu/display/fisid_115293)
Professor; PhD, Cornell University

Reitzammer, Laurialan Blake (https://experts.colorado.edu/display/fisid_145810)
Associate Professor; PhD, University of California-Berkeley

Schütrumpf, Eckart E. W.
Professor Emeritus

Tzavella-Evjen, Terpsichori H.
Professor Emeritus

CLAS 1010 (3) The Study of Words

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: LING 1010

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 1020 (3) Argument from Evidence: Critical Writing about the Ancient World

Introduces students to writing about the ancient world, with special attention to the possibilities and the limitations of ancient source-material. Taught as a writing workshop, with emphasis on critical thinking, analysis, argument and inquiry. While the course reads foundational ancient texts, the skills acquired will be broadly useful among humanities disciplines.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Literature, Culture, and Thought
MAPS Course: English

CLAS 1030 (3) Introduction to Western Philosophy: Ancient

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 1010

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Literature, Culture, and Thought

CLAS 1051 (3) The World of the Ancient Greeks

Surveys of the emergence, major accomplishments, failures and the decline of the ancient Greeks, from the Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.). No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1051

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Ancient History

CLAS 1061 (3) The Rise and Fall of Ancient Rome

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1061

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Ancient History

CLAS 1071 (3) Ancient Sport and Spectacle

Surveys the development, evolution and impact of sport and spectacle in the Greco-Roman world through the deconstruction of games during the Christian era of the Roman Empire. Examines, among other relevant topics, games in the Homeric tradition, the development of the Greek Olympics and Roman spectacles including the circus, amphitheatres and gladiators.

CLAS 1100 (3) Greek Mythology

Covers the Greek myths as documents of early human religious experience and imagination, the source of Greek culture, and part of the fabric of Western cultural tradition. Of particular interest to students of literature and the arts, psychology, anthropology, and history. No Greek or Latin required.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 1110 (3) Gods, Monsters and Mortals: Literature of Ancient Greece

Read about mythological heroes and historical individuals from Achilles to Socrates. Explore why Greek authors told stories the way they did and what those stories might have meant to them and might mean to us. Ancient texts in English translation.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 1115 (3) Masterpieces of Greek Literature in Translation

Students read about mythological heroes and historical individuals from Achilles to Socrates in Greek literature. Class discusses why the Greeks told stories the way they did and what those stories might have meant to them and might mean to us.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Honors

CLAS 1120 (3) Power and Passion in Ancient Rome

Read about mythological heroes and historical individuals from Romulus to Catiline and the emperors Augustus and Nero. Explore why Roman authors told stories the way they did and what those stories might have meant and might mean to us. Ancient texts in English translation.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 1140 (3) Bread and Circuses: Society and Culture in the Roman World

Surveys the outstanding achievements of Roman culture and society as reflected in literature; philosophy and art; private and official religion; and legal and political thought. No Greek or Latin required.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Historical Context
Departmental Category: Literature, Culture, and Thought

CLAS 1509 (4) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 1509

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Arts Sci Core Curr: Historical Context
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art and Archaeology

CLAS 2020 (3) Science in the Ancient World

Covers the development of scientific modes of thought, theory, and research from mythological origins (e.g., Hesiod's poetry) through pre-Socratic philosophers. Culminates in theories and research of Plato and Aristotle, including the Roman Empire. Students read original sources in translation. No Greek or Latin required.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 2029 (3) Art and Archaeology of Ancient Egypt

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 2029

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art and Archaeology

CLAS 2039 (3) Greek Art and Archaeology

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture. Formerly CLAS 3039.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 2039

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art and Archaeology

CLAS 2041 (3) War and Society in Ancient Greece

Studies Greek warfare in its cultural, social and economic contexts, in the light of anthropological comparisons and modern theories. No Greek or Latin required.

Additional Information: Departmental Category: Ancient History

CLAS 2049 (3) Introduction to Roman Art and Architecture

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces. Formerly CLAS 3049.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 2049

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art and Archaeology

CLAS 2100 (3) Gender and Sexuality in Ancient Greece

Examines evidence of art, archaeology, and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature, and daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2100

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Literature, Culture, and Thought

CLAS 2110 (3) Gender and Sexuality in Ancient Rome

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2110

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Human Diversity
Departmental Category: Literature, Culture, and Thought

CLAS 2610 (3) Paganism to Christianity

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2614

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Literature, Culture, and Thought

CLAS 3009 (3) Modern Issues, Ancient Times

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly CLAS 2009.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 3009

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Art and Archaeology

CLAS 3019 (3) Pompeii and the Cities of Vesuvius

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 3019

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Art and Archaeology

CLAS 3400 (3) Special Topics in Classics

Topics in Greek, Latin or Classical civilization.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5021 and HIST 4021

Additional Information: Departmental Category: Ancient History

CLAS 4031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5031 and HIST 4031

Recommended: Prerequisite one of the following CLAS 1051, 1509, 2041, 2039, 4021, 4041, 4139, 4149, GREK 3113, HIST 1051, 4021, 4041.

Additional Information: Departmental Category: Ancient History

CLAS 4040 (3) Seminar in Classical Antiquity

Examines an advanced topic in classical language, literature, history, philosophy, art, or culture. Combines the techniques of philology with a critical approach to the literary and material legacy of the past.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Requisite second-year proficiency in Greek or Latin.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5041 and HIST 4041 and PHIL 4210

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1061 or HIST 1011 or HIST 1051 or HIST 1061 or PSCI 2004 or PHIL 3000.

Additional Information: Departmental Category: Ancient History

CLAS 4061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5061 and HIST 4061 and HIST 5061

Additional Information: Departmental Category: Ancient History

CLAS 4071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5071 and HIST 4071

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Ancient History

CLAS 4081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5081 and HIST 4081

Additional Information: Departmental Category: Ancient History

CLAS 4091 (3) The Roman Empire

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5091 and HIST 4091

Additional Information: Departmental Category: Ancient History

CLAS 4109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous course work on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5109 and ARTH 4109 and ARTH 5109

Recommended: Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4110 (3) Greek and Roman Epic

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5110 and HUMN 4110

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 4119 (3) Roman Sculpture

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5119 and ARTH 4119 and ARTH 5119

Additional Information: Departmental Category: Art and Archaeology

CLAS 4120 (3) Greek and Roman Tragedy

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5120 and HUMN 4120

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 4129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5129 and ANTH 4129 and ANTH 5129 and ARTH 4129

Additional Information: Departmental Category: Art and Archaeology

CLAS 4130 (3) Greek and Roman Comedy

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5130 and HUMN 4130

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 4139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5139 and ARTH 4139 and ARTH 5139

Additional Information: Departmental Category: Art and Archaeology

CLAS 4140 (3) The Greek and Roman Novel

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5140 and HUMN 4131

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4149 (3) Greek Cities and Sanctuaries

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5149 and ARTH 4149

Additional Information: Departmental Category: Art and Archaeology

CLAS 4169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5169 and ARTH 4169 and ARTH 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4199 (3) Roman Architecture

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures, including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5199 and ARTH 4199

Additional Information: Departmental Category: Art and Archaeology

CLAS 4209 (6) Classical Archaeological Field Methods

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4209 and CLAS 5209

Recommended: Prerequisites CLAS 1509 or ARTH 1509 or ARTH 2039 and ARTH 2049.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5229 and ARTH 4229 and ARTH 5229

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Art and Archaeology

CLAS 4269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5269 and ARTH 4269 and ARTH 5269

Recommended: Prerequisite CLAS 1509 or ARTH 1509.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Art and Archaeology

Departmental Category: Asia Content

CLAS 4761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5761 and HIST 4761 and HIST 5761

Additional Information: Departmental Category: Ancient History

CLAS 4840 (1-4) Independent Study

No Greek or Latin required.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4849 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4852 (1-6) Honors Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sciences Honors Course
Departmental Category: Classical Philology

GREK 1013 (4) Beginning Classical Greek 1

For students with no previous knowledge of Greek. Introduces basic grammar and vocabulary.

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Greek

GREK 1023 (4) Beginning Classical Greek 2

Completes the presentation of grammar and introduces reading of literature.

Recommended: Prerequisite GREK 1013.

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Greek

GREK 3013 (1) Readings in the Greek New Testament and Septuagint

Readings in ancient (koine) Greek from the New Testament and the Septuagint. Students aim to achieve fluency in reading and to enrich their knowledge of key terms and ideas borrowed from the Greek past in the early Christian tradition. Formerly CLAS 3013.

Repeatable: Repeatable for up to 4.00 total credit hours.

Recommended: Prerequisites GREK 1013 and GREK 1023.

Additional Information: Departmental Category: Greek

GREK 3113 (3) Intermediate Classical Greek 1

Reading of selected prose texts of authors in ancient Greek such as Plato, Xenophon, Lysias, and selections from the Greek New Testament. Incorporates review of grammar.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites GREK 1013 and GREK 1023.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Greek

GREK 3123 (3) Intermediate Classical Greek 2

Reading of selections from Homer or a Greek tragedy in ancient Greek, with attention to literary form and context as well as advanced grammar and syntax.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites GREK 1013 and GREK 1023 and GREK 3113.

Additional Information: Departmental Category: Greek

GREK 4013 (3) Topics in Greek Prose

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

Equivalent - Duplicate Degree Credit Not Granted: GREK 5013

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Greek

GREK 4023 (3) Topics in Greek Poetry

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

Equivalent - Duplicate Degree Credit Not Granted: GREK 5023

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Greek

GREK 4093 (3) Survey of Greek Literature

Greek literary history in ancient Greek from Homer to the Hellenistic age.

Equivalent - Duplicate Degree Credit Not Granted: GREK 5093

Recommended: Prerequisites GREK 3113 and GREK 3123.

Additional Information: Departmental Category: Greek

GREK 4843 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Greek

LATN 1014 (4) Beginning Latin 1

Introduces basic grammar and vocabulary. For students with no previous knowledge of Latin.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Latin

LATN 1024 (4) Beginning Latin 2

Completes the presentation of grammar, incorporates review of fundamentals, and introduces reading of literature. For students with previous experience of Latin.

Recommended: Prerequisite LATN 1014.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Latin

LATN 2004 (3) Accelerated Latin 1

Intensive introductory course in Latin including a survey of grammar and practice reading and writing. No previous knowledge of Latin is required.

Additional Information: Departmental Category: Latin

LATN 2044 (3) Accelerated Latin 2

Continuation of LATN 2004. Reading of advanced texts: Caesar, Cicero, Ovid and others.

Recommended: Prerequisite LATN 2004.

Additional Information: Departmental Category: Latin

LATN 2114 (4) Intermediate Latin 1

Readings from Caesar and/or Cicero, with review of grammar.

Recommended: Prerequisite LATN 1024.

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Latin

LATN 2124 (3) Intermediate Latin 2

Selections from Virgil's Aeneid with attention to literary form and context as well as advanced grammar and syntax.

Recommended: Prerequisite LATN 2114.

Additional Information: Departmental Category: Latin

LATN 3014 (3) Introduction to Latin Prose

Author or topic in Latin specified in the online Schedule Planner (e.g., Cicero, Livy, Pliny). Formerly CLAS 3014.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Latin

LATN 3024 (3) Introduction to Latin Poetry

Author or topic in Latin specified in the online Schedule Planner (e.g., Virgil, Ovid, Catullus, Horace).

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Latin

LATN 4014 (3) Topics in Latin Prose

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

Equivalent - Duplicate Degree Credit Not Granted: LATN 5014

Repeatable: Repeatable for up to 9.00 total credit hours.

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4024 (3) Latin Prose Composition

Reviews grammar and syntax. Introduces Latin prose style and composition.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5024

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4044 (3) Topics in Latin Poetry

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

Equivalent - Duplicate Degree Credit Not Granted: LATN 5044

Repeatable: Repeatable for up to 9.00 total credit hours.

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4084 (3) Survey of Roman Literature Part 2: Imperial

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5084

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4094 (3) Survey of Roman Literature Part 1: Republican to Augustan

Introduces Roman literary history from its origins to the 30s BCE. Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5094

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4824 (3) Latin Teaching Methods: Open Topics

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5824

Additional Information: Departmental Category: Latin

LATN 4844 (1-3) Independent Study

Formerly CLAS 4844.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Latin

Classics - Bachelor of Arts (BA)

Through consultation with the undergraduate advisor, the bachelor's degree in classics is tailored to the student's interests in the field. Major and minor programs can be arranged with a concentration in either Latin or Greek or a combination of the two, with a focus on classical literature, culture and thought (including mythology, literature, philosophy, religion, art, archaeology and history) or with a particular emphasis on classical history, art and archaeology. Prospective majors and minors should consult with the undergraduate advisor.

The undergraduate degree in classics emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Greek and Roman literature, from Homer to the end of classical antiquity;
- the historical and cultural contexts of particular works; and
- the art, religion and philosophy of ancient Greece and Rome and their roles in world cultural history.

In addition, students completing the degree in classics are expected to acquire the ability and skills to:

- read, understand and interpret written documents and works of literature in ancient Greek or Latin where relevant, as well as in translation;
- communicate in spoken and written form with adequate clarity and complexity for the relevant audience; and
- read and think critically.

Interested students are encouraged to consult colorado.edu/classics/undergraduate (<http://classics.colorado.edu/undergraduate>) for more information.

Concurrent Degree Program

BA/MA in Classics

The five-year BA/MA concurrent degree program in classics is designed for students who enter the University of Colorado ready to take courses in Latin or Greek at the 3000-level or above, and who wish to prepare themselves for application to competitive PhD programs in classics. Students without adequate preparation in at least one language would find it difficult to complete two degrees in five years, since proficiency in the languages comes largely from practice and experience. Students will

normally need to study both Latin and Greek in order to meet their course requirements within five years: course offerings in just one language will normally not be sufficient. The five-year degree combines the BA in Greek and/or Latin (Track I) with the MA in classics with concentration in Greek or Latin (Program I), Plan II (no thesis). Students with strong research interests may be able to complete the BA with honors or the MA with concentration in Greek or Latin, Plan I (with thesis). Graduates of the BA/MA program who have completed their work in excellent fashion will be well prepared to apply for PhD programs in classics. Students who enter CU with an already strong knowledge of Latin or Greek may be eligible to pursue a five-year concurrent bachelor's/master's degree (BA/MA).

Here is a guide to the concurrent degree program (<http://www.colorado.edu/classics/bama-guide>); for more information, contact the Associate Chair for Undergraduate Studies.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Students must complete the College of Arts and Sciences major requirements, including: a minimum of 36 credit hours, all with a grade of a C- or better, in the major; a minimum 2.00 GPA for courses in the major; and a minimum of 18 upper-division credit hours in the major.

Track I: Greek, Latin or Greek and Latin

Required Courses and Credit Hours

Greek and/or Latin ¹	30
Select 6 elective credit hours from either of the following groups:	6
Classical Literature, Culture and Thought Group:	
CLAS 1010	The Study of Words
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
CLAS 2020	Science in the Ancient World
CLAS 2100	Gender and Sexuality in Ancient Greece
CLAS 2110	Gender and Sexuality in Ancient Rome
CLAS 2610	Paganism to Christianity
CLAS 3400	Special Topics in Classics
CLAS 4040	Seminar in Classical Antiquity
CLAS 4110	Greek and Roman Epic
CLAS 4120	Greek and Roman Tragedy
CLAS 4130	Greek and Roman Comedy
CLAS 4140	The Greek and Roman Novel
CLAS 4840	Independent Study
HEBR 1030	Beginning Biblical Hebrew, First Semester
PHIL 3000	History of Ancient Philosophy
Ancient History, Art, and Archaeology Group:	
CLAS 1051	The World of the Ancient Greeks
CLAS 1061	The Rise and Fall of Ancient Rome

CLAS 1509	Trash and Treasure,Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4761	Roman Law
CLAS 4849	Independent Study
<hr/>	
Total Credit Hours	36

¹ Students should designate either Greek or Latin as the primary field of language study. The introductory sequence, GREK 1013-GREK 1023 or LATN 1014-LATN 1024, of the primary language does not count toward the major. If a student also takes the second language, all credit hours taken in that language as well as any other Greek and Latin credit hours above the 1000-level count toward the major. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the major.

Track II: Literature, Culture, and Thought

Required Courses and Credit Hours

Select 18 credit hours from following Classical Literature, Culture and Thought group:

CLAS 1010	The Study of Words
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome

CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
CLAS 2020	Science in the Ancient World
CLAS 2100	Gender and Sexuality in Ancient Greece
CLAS 2110	Gender and Sexuality in Ancient Rome
CLAS 2610	Paganism to Christianity
CLAS 3400	Special Topics in Classics
CLAS 4040	Seminar in Classical Antiquity
CLAS 4110	Greek and Roman Epic
CLAS 4120	Greek and Roman Tragedy
CLAS 4130	Greek and Roman Comedy
CLAS 4140	The Greek and Roman Novel
CLAS 4840	Independent Study
HEBR 1030	Beginning Biblical Hebrew, First Semester
PHIL 3000	History of Ancient Philosophy
Select 12 credit hours from the following Ancient History, Art and Archaeology group:	
CLAS 1051	The World of the Ancient Greeks
CLAS 1061	The Rise and Fall of Ancient Rome
CLAS 1509	Trash and Treasure,Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4761	Roman Law
CLAS 4849	Independent Study
Greek and/or Latin ¹	
Total Credit Hours	36

¹ Students should designate either Greek or Latin as the primary field of language study. The introductory sequence, GREK 1013-GREK 1023 or LATN 1014-LATN 1024, of the primary language does not count toward the major. If a student also takes the second language, all credit hours taken in that language as well as any Greek and Latin credit hours above the 1000-level count toward the major. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the major.

Track III: History, Art and Archaeology

Required Courses and Credit Hours

Select 18 credit hours from the following Ancient History, Art and Archaeology group: 18

CLAS 1051	The World of the Ancient Greeks
CLAS 1061	The Rise and Fall of Ancient Rome
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic
CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4761	Roman Law
CLAS 4849	Independent Study

Select 12 credit hours from the following Classical Literature, Culture and Thought group: 12

CLAS 1010	The Study of Words
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation

CLAS 1120	Power and Passion in Ancient Rome	
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World	
CLAS 2020	Science in the Ancient World	
CLAS 2100	Gender and Sexuality in Ancient Greece	
CLAS 2110	Gender and Sexuality in Ancient Rome	
CLAS 2610	Paganism to Christianity	
CLAS 3400	Special Topics in Classics	
CLAS 4040	Seminar in Classical Antiquity	
CLAS 4110	Greek and Roman Epic	
CLAS 4120	Greek and Roman Tragedy	
CLAS 4130	Greek and Roman Comedy	
CLAS 4140	The Greek and Roman Novel	
CLAS 4840	Independent Study	
HEBR 1030	Beginning Biblical Hebrew, First Semester	
PHIL 3000	History of Ancient Philosophy	
Greek and/or Latin ¹		6
Total Credit Hours		36

¹ Students should designate either Greek or Latin as the primary field of language study. The introductory sequence, GREK 1013-GREK 1023 or LATN 1014-LATN 1024, of the primary language does not count toward the major. If a student also takes the second language, all credit hours taken in that language as well as any Greek and Latin credit hours above the 1000-level count toward the major. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the major.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in classics, students should meet the following requirements:

- Declare the classics major by the beginning of the second semester.
- Students must consult frequently with a major advisor to determine adequate progress toward completion of the major.

Classics - Minor

The department offers courses in language and literature, ancient history, art and archaeology, and philosophy within several programs of study. Classics ranks among the most vibrant programs in humanistic studies at the University of Colorado, a department in which students at every level are challenged to integrate the world of scholarship into their daily lives. The department offers a minor in classics that can satisfy your needs.

Requirements

The department offers a minor in classics for students who would like to study the world of antiquity but don't have the time to devote to a major. Students are subject to the College of Arts and Sciences minor requirements, including:

- a minimum of 18 credit hours, all with a grade of C- or better, in the minor,
- a minimum of 9 upper-division credit hours in the minor, and
- a minimum 2.00 GPA for courses in the minor.

The specific requirements for completion of the classics minor are as follows:

Required Courses and Credit Hours

Track I: Greek and/or Latin Language and Literature

Greek and/or Latin¹ 12

Select 6 elective credit hours from either of the following groups: 6

Classical Literature, Culture and Thought Group:

CLAS 1010	The Study of Words
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
CLAS 2020	Science in the Ancient World
CLAS 2100	Gender and Sexuality in Ancient Greece
CLAS 2110	Gender and Sexuality in Ancient Rome
CLAS 2610	Paganism to Christianity
CLAS 3400	Special Topics in Classics
CLAS 4040	Seminar in Classical Antiquity
CLAS 4110	Greek and Roman Epic
CLAS 4120	Greek and Roman Tragedy
CLAS 4130	Greek and Roman Comedy
CLAS 4140	The Greek and Roman Novel
CLAS 4840	Independent Study
HEBR 1030	Beginning Biblical Hebrew, First Semester
PHIL 3000	History of Ancient Philosophy

Ancient History, Art, and Archaeology Group:

CLAS 1051	The World of the Ancient Greeks
CLAS 1061	The Rise and Fall of Ancient Rome
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CLAS 2029	Art and Archaeology of Ancient Egypt
CLAS 2039	Greek Art and Archaeology
CLAS 2041	War and Society in Ancient Greece
CLAS 2049	Introduction to Roman Art and Architecture
CLAS 3009	Modern Issues, Ancient Times
CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 4021	Athens and Greek Democracy
CLAS 4031	Alexander the Great and the Rise of Macedonia
CLAS 4041	Classical Greek Political Thought
CLAS 4061	Twilight of Antiquity
CLAS 4071	Seminar in Ancient Social History
CLAS 4081	The Roman Republic

CLAS 4091	The Roman Empire
CLAS 4109	Ancient Italian Painting
CLAS 4119	Roman Sculpture
CLAS 4129	Aegean Art and Archaeology
CLAS 4139	Greek Vase Painting
CLAS 4149	Greek Cities and Sanctuaries
CLAS 4169	Topics in Ancient and Classical Art and Archaeology
CLAS 4199	Roman Architecture
CLAS 4209	Classical Archaeological Field Methods
CLAS 4229	Ancient Egyptian Art and Archaeology
CLAS 4269	Art and Archaeology of the Ancient Near East
CLAS 4761	Roman Law
CLAS 4849	Independent Study

Total Credit Hours 18

¹ Students should designate either Greek or Latin as the primary field of language study. The introductory sequence, GREK 1013-GREK 1023 or LATN 1014-LATN 1024, of the primary language does not count toward the minor. If a student also takes the second language, all credit hours taken in that language as well as any other Greek and Latin credit hours above the 1000-level count toward the minor. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the minor.

Track II: Classical Studies

Select 6 credit hours from the following Classical Literature, Culture and Thought group: 6

CLAS 1010	The Study of Words
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
CLAS 1030	Introduction to Western Philosophy: Ancient
CLAS 1100	Greek Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
CLAS 2020	Science in the Ancient World
CLAS 2100	Gender and Sexuality in Ancient Greece
CLAS 2110	Gender and Sexuality in Ancient Rome
CLAS 2610	Paganism to Christianity
CLAS 3400	Special Topics in Classics
CLAS 4040	Seminar in Classical Antiquity
CLAS 4110	Greek and Roman Epic
CLAS 4120	Greek and Roman Tragedy
CLAS 4130	Greek and Roman Comedy
CLAS 4140	The Greek and Roman Novel
CLAS 4840	Independent Study
HEBR 1030	Beginning Biblical Hebrew, First Semester
PHIL 3000	History of Ancient Philosophy

Select 6 credit hours from the following Ancient History, Art, and Archaeology Group:

CLAS 1051	The World of the Ancient Greeks	6
CLAS 1061	The Rise and Fall of Ancient Rome	
CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World	
CLAS 2039	Greek Art and Archaeology	
CLAS 2041	War and Society in Ancient Greece	
CLAS 2049	Introduction to Roman Art and Architecture	
CLAS 3009	Modern Issues, Ancient Times	
CLAS 3019	Pompeii and the Cities of Vesuvius	
CLAS 4021	Athens and Greek Democracy	
CLAS 4031	Alexander the Great and the Rise of Macedonia	
CLAS 4041	Classical Greek Political Thought	
CLAS 4061	Twilight of Antiquity	
CLAS 4071	Seminar in Ancient Social History	
CLAS 4081	The Roman Republic	
CLAS 4091	The Roman Empire	
CLAS 4109	Ancient Italian Painting	
CLAS 4119	Roman Sculpture	
CLAS 4129	Aegean Art and Archaeology	
CLAS 4139	Greek Vase Painting	
CLAS 4149	Greek Cities and Sanctuaries	
CLAS 4169	Topics in Ancient and Classical Art and Archaeology	
CLAS 4199	Roman Architecture	
CLAS 4209	Classical Archaeological Field Methods	
CLAS 4229	Ancient Egyptian Art and Archaeology	
CLAS 4269	Art and Archaeology of the Ancient Near East	
CLAS 4761	Roman Law	
CLAS 4849	Independent Study	

Select 3 credit hours from either the Classical Literature, Culture and Thought group or the Ancient History, Art and Archaeology group listed above

Greek and/or Latin ¹	3
Total Credit Hours	18

¹ Students should designate either Greek or Latin as the primary field of language study. The introductory sequence, GREK 1013-GREK 1023 or LATN 1014-LATN 1024, of the primary language does not count toward the minor. If a student also takes the second language, all credit hours taken in that language as well as any Greek and Latin credit hours above the 1000-level count toward the minor. If a student has learned the equivalent of the introductory sequence in the primary language before beginning language study at CU and begins language instruction in the department at the 2000-level or above, all credit hours in both languages immediately count toward the minor.

Cognitive Science

Cognitive science is the study of human knowledge, of which one aspect is the study of how knowledge is acquired, stored and represented in the mind, including the mind's underlying biological mechanisms. Another aspect of cognitive science concerns how knowledge is understood, remembered, communicated and used in the performance of activities,

including the acquisition and application of skills and information. This latter aspect provides the practical applications of cognitive science, and thereby ensures a demand for graduates in both academic and industrial markets.

Training for graduates in cognitive science prepares students admirably for many of the fields that are targeted as the major growth fields of the 21st century: telecommunications, information processing, medical analysis, data retrieval, education and multimedia services.

The undergraduate program includes courses in the seven core departments, with basic courses and two of five possible advanced skill sequences of courses. For more information, visit the Institute of Cognitive Science's Undergraduate Program (<http://www.colorado.edu/ics/undergraduate-program>) webpage.

Certificate

- Cognitive Science - Certificate (p. 244)

Cognitive Science - Certificate

Undergraduate students majoring in Psychology and Neuroscience; Philosophy; Linguistics; Computer Science; Speech, Language, and Hearing Sciences; Education; Integrative Physiology; Information Science; or Architecture and Planning may be interested in extending the breadth of their undergraduate studies to earn a certificate in cognitive science.

Training in cognitive science prepares students admirably well for many of the fields that are targeted as the major growth fields of the 21st century: telecommunications, information processing, medical analysis, data retrieval, education, and multimedia. As the world is enveloped by the information age, cognitive scientists will be uniquely positioned to deal with this information.

Students interested in the program can learn more on the ICS website (<https://www.colorado.edu/ics/undergraduate-program>).

Requirements

To earn the certificate, students must take at least six courses for a minimum of 18 credit hours. Students must receive a grade of C or better in all courses for the certificate and must have an overall grade point average of 3.0 or better.

Additional credit hours may be required as prerequisites to classes chosen to fulfill the certificate plan of study, but these courses usually also fulfill degree requirements. Proposed substitute courses must be preapproved by the ICS Academic Director.

Required Courses and Credit Hours

Required Courses

PSYC 2145	Introductory Cognitive Psychology	3
CSCI 3702/ PHIL 3310/ LING 3005/PSYC 3005	Cognitive Science	3

Advanced Skills Requirements 12-14

Take a two-course advanced skills sequence from two of the following five areas, one sequence may be in the student's major.

Psychology

Taking classes in the psychology focus area would require a minimum of 7 units, and an additional minimum of 4 units for prerequisites.

PSYC 4145	Advanced Cognitive Psychology
NRSC 4032	Neurobiology of Learning and Memory
PSYC 4155	Cognitive Neuroscience/Neuropsychology
PSYC 4165	Psychology of Perception
PSYC 4175	Computational Cognitive Neuroscience
PSYC 4220	Language and Mind

Linguistics

Taking classes in the linguistics focus area would require a minimum of 6 units, and an additional minimum of 3 units for prerequisites.

LING 3100	Language Sound Structures
LING 3430	Semantics
LING 4220	Language and Mind
LING 4420	Morphology and Syntax
LING 4560	Language Development

Computer Science

Taking classes in the computer science focus area would require a minimum of 6 units and an additional minimum of 4 units for prerequisites. Choose two of the following:

CSCI 3002	HCC Foundations/User-Centered Design and Development 1
CSCI 3202	Introduction to Artificial Intelligence
CSCI 4830	Special Topics in Computer Science

Philosophy

Taking classes in the Philosophy focus area would require a minimum of 6 units, and an additional minimum of 3 units for prerequisites. Two of the following six courses in Philosophy:

PHIL 4300	Philosophy of Mind
PHIL 4340	Epistemology
PHIL 4400	Philosophy of Science
PHIL 4460	Modal Logic
PHIL 4490	Philosophy of Language

Speech, Language and Hearing Sciences

Taking classes in the speech, language and hearing Sciences focus area would require a minimum of 6 units, and an additional 3 units for prerequisites.

SLHS 3006	Phonetics
SLHS 3106	Hearing Science
SLHS 3116	Speech Science
SLHS 4502	Language Disorders: Child and Adult
SLHS 4560	Language Development

Total Credit Hours

18-20

Computer Science

Computer science is an exciting and challenging field with impact on much of modern life. Computer scientists craft the technologies enabling the digital devices used every day. They develop the large-scale software powering business and industry, and they advance the computational techniques and write the software that supports scientists in their study of the world around us. They create the software that social scientists use to identify and analyze patterns in the behavior of social groups and human behavior in social networks and the applications

humanists and linguists use to research language development. Many new applications of computing technology remain to be discovered and computing will be at the heart of future revolutions in business, science and society. Students who study computer science now will be at the forefront of those important advances.

Computer science is concerned with how computers are constructed, how they are used to store and process data, how they are used in problem-solving, and how they are used to assess the quality of solutions to problems.

Creating software for a variety of users requires understanding how software interacts with the hardware on which it runs. Computer science goes well beyond the machine to the study of how people interact with the technologies around them. Applications of computer science reach far and wide.

The course code for this program is CSCI.

Career Possibilities

Computer science graduates from CU Boulder are engaged in a variety of jobs with organizations worldwide in fields such as communications, finance, publishing and research. They are software developers, teachers, writers, doctors, lawyers, scientists, military leaders and entrepreneurs. Many computer science graduates lead highly successful companies that they themselves have founded.

Facilities, Programs and Opportunities

The Department of Computer Science utilizes a modern computing infrastructure facilitating its research and educational missions. The department has a variety of computing facilities for use by faculty, staff and students including general purpose computing labs provided by the university, additional instructional labs and administrative computing resources provided by the department and specialized labs for individual research groups. The variety of computing resources provides students the opportunity to learn about and use cutting-edge equipment and software.

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Students learn to write proposals, conduct research, pursue creative work, analyze data and present the results. For more information, call UROP at 303-492-2596 or visit the UROP website (<http://www.colorado.edu/suep/urop>).

There are many networking opportunities with companies offering paid internships. CU's location near Boulder's tech start-up community, national research labs and traditional tech companies such as Google, IBM, Oracle and Microsoft, gives students with computer science skills many employment opportunities while earning their degrees.

Bachelor's Degree

- Computer Science - Bachelor of Arts (BA) (p. 253)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Kenneth M (https://experts.colorado.edu/display/fisid_113566)
Professor; PhD, University of California-Irvine

Bennett, John Knox (https://experts.colorado.edu/display/fisid_116933)
Professor; PhD, University of Washington

Black, John (https://experts.colorado.edu/display/fisid_126540)
Associate Professor; PhD, University of California-Davis

Boese, Elizabeth Sugar (https://experts.colorado.edu/display/fisid_154230)
Instructor; MS, Colorado State University

Bradley, Elizabeth (https://experts.colorado.edu/display/fisid_100546)
Professor; PhD, Massachusetts Institute of Technology

Brown, Timothy X (https://experts.colorado.edu/display/fisid_107534)
Professor; PhD, California Institute of Technology

Brubaker, Jed Richards (https://experts.colorado.edu/display/fisid_156193)
Assistant Professor; PhD, University of California-Irvine

Byrd, Richard H.
Professor Emeritus; PhD, Rice University

Cai, Xiao-Chuan (https://experts.colorado.edu/display/fisid_100636)
Professor; PhD, New York University

Cerny, Pavol (https://experts.colorado.edu/display/fisid_151749)
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan (https://experts.colorado.edu/display/fisid_146087)
Assistant Professor; PhD, University of California-Berkeley

Chen, Lijun (https://experts.colorado.edu/display/fisid_149472)
Assistant Professor; PhD, California Institute of Technology

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Colunga, Eliana (https://experts.colorado.edu/display/fisid_129477)
Associate Professor; PhD, Indiana University Bloomington

Correll, Nicolaus J (https://experts.colorado.edu/display/fisid_147555)
Assistant Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Dowell-Deen, Robin DeAnne (https://experts.colorado.edu/display/fisid_147779)
Assistant Professor; DSc, Washington University

Ehrenfeucht, Andrzej
Professor Emeritus

Eisenberg, Michael A (https://experts.colorado.edu/display/fisid_100427)
Professor; PhD, Massachusetts Institute of Technology

Ellis, Clarence A.
Professor Emeritus

Fischer, Gerhard
Professor Emeritus; PhD, University of Hamburg

Fosdick, Lloyd D.
Professor Emeritus

Frew, Eric W (https://experts.colorado.edu/display/fisid_134685)
Associate Professor; PhD, Stanford University

Frongillo, Rafael M (https://experts.colorado.edu/display/fisid_156416)
Assistant Professor; PhD, University of California-Berkeley

Gabow, Harold
Professor Emeritus; PhD, Stanford University

Gross, Mark D (https://experts.colorado.edu/display/fisid_100095)
Professor; PhD, Massachusetts Institute of Technology

Grunwald, Dirk C (https://experts.colorado.edu/display/fisid_102261)
Professor; PhD, University of Illinois at Urbana-Champaign

Ha, Sangtae (https://experts.colorado.edu/display/fisid_153246)
Assistant Professor; PhD, North Carolina State University at Raleigh

Hall, David Matthew (https://experts.colorado.edu/display/fisid_147474)
Asst Research Professor

Hammer, Matthew A (https://experts.colorado.edu/display/fisid_156066)
Assistant Professor; PhD, University of Chicago

Han, Richard Yehwei (https://experts.colorado.edu/display/fisid_122947)
Associate Professor; PhD, University of California-Berkeley

Hoenigman, Rhonda Olcott (https://experts.colorado.edu/display/fisid_152997)
Instructor; PhD, University of Colorado Boulder

Hunter, Lawrence E (https://experts.colorado.edu/display/fisid_143568)
Professor

Jansen, Kenneth E (https://experts.colorado.edu/display/fisid_147360)
Professor; PhD, Stanford University

Jessup, Elizabeth R (https://experts.colorado.edu/display/fisid_102065)
Professor; PhD, Yale University

Kallen-Brown, Jedediah A (https://experts.colorado.edu/display/fisid_153965)
Assistant Professor; DSc, ETH Zurich (Switzerland)

Kane, Shaun Kevin (https://experts.colorado.edu/display/fisid_154603)
Assistant Professor; PhD, University of Washington

Keegan, Brian (https://experts.colorado.edu/display/fisid_158122)
Assistant Professor; PhD, Northwestern University

Keller, Eric Robert (https://experts.colorado.edu/display/fisid_151647)
Assistant Professor; PhD, Princeton University

Ketelsen, Christian W (https://experts.colorado.edu/display/fisid_147863)
Instructor; PhD, University of Colorado Boulder

King, Roger A.
Professor Emeritus

Knox, David Allen (https://experts.colorado.edu/display/fisid_158054)
Instructor; PhD, University of Colorado Health Sciences Center

Lewis, Clayton H (https://experts.colorado.edu/display/fisid_100307)
Professor; PhD, University of Michigan Ann Arbor

Lv, Qin (https://experts.colorado.edu/display/fisid_145832)
Associate Professor; PhD, Princeton University

Main, Michael G.
Professor Emeritus; PhD, Washington State University

Martin, James H (https://experts.colorado.edu/display/fisid_100495)
Professor; PhD, University of California-Berkeley

McBryan, Oliver
Professor Emeritus

Mishra, Shivakant (https://experts.colorado.edu/display/fisid_118376)
Professor; PhD, University of Arizona

Mozer, Michael C (https://experts.colorado.edu/display/fisid_105922)
Professor; PhD, University of California-San Diego

Nutt, Gary J.
Professor Emeritus

Palen, Leysia A (https://experts.colorado.edu/display/fisid_114604)
Professor; PhD, University of California-Irvine

Palmer, Martha (https://experts.colorado.edu/display/fisid_138162)
Professor; PhD, Univ of Edinburgh (Scotland)

Paul, Michael J (https://experts.colorado.edu/display/fisid_156070)
Assistant Professor; PhD, Johns Hopkins University

Repenning, Alexander (https://experts.colorado.edu/display/fisid_104946)
Research Professor; PhD, University of Colorado Boulder

Sanders, Bruce W.
Professor Emeritus

Sankaranarayanan, Sriram (https://experts.colorado.edu/display/fisid_147413)
Associate Professor; PhD, Stanford University

Schnabel, Robert B.
Professor Emeritus

Schreuder, Willem A (https://experts.colorado.edu/display/fisid_143834)
Asst Professor Adjunct

Shapiro, Ryan Benjamin (https://experts.colorado.edu/display/fisid_156418)
Assistant Professor; PhD, Northwestern University

Sibley, Gabriel T (https://experts.colorado.edu/display/fisid_154632)
Assistant Professor; PhD, University of Southern California

Sicker, Douglas C. (https://experts.colorado.edu/display/fisid_123114)
Professor; PhD, University of Pittsburgh

Sumner, Tammy R (https://experts.colorado.edu/display/fisid_105742)
Professor; PhD, University of Colorado Boulder

Szafir, Daniel James (https://experts.colorado.edu/display/fisid_156420)
Assistant Professor; PhD, University of Wisconsin-Madison

Szafir, Danielle N (https://experts.colorado.edu/display/fisid_156317)
Assistant Professor; PhD, University of Wisconsin-Madison

Tufo, Henry (https://experts.colorado.edu/display/fisid_127040)
Research Professor; PhD, Brown University

Voida, Amy Kathryn Mitchell (https://experts.colorado.edu/display/fisid_155855)
Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A (https://experts.colorado.edu/display/fisid_155856)
Assistant Professor; PhD, Georgia Institute of Technology

Waite, William M.
Professor Emeritus

Ward, Wayne Hinson (https://experts.colorado.edu/display/fisid_114680)
Research Professor; PhD, University of Colorado Boulder

Winklmann, Karl A.
Professor Emeritus

Wustrow, Eric A. (https://experts.colorado.edu/display/fisid_156419)
Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Pei Hsiu (https://experts.colorado.edu/display/fisid_151584)
Assistant Professor; PhD, Massachusetts Institute of Technology

Ying, Jordan Boyd-Graber (https://experts.colorado.edu/display/fisid_154406)
Assistant Professor; PhD, Princeton University

CSCI 1000 (1) Computer Science as a Field of Work and Study

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience.

Requisites: Restricted to students with 0-26 credits (Freshmen) Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA or CSCI-ADL) majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 1200 (3) The Art of Computational Thinking and Computer Programming

Teaches computational thinking and techniques for writing computer programs using the Python programming language. Intended for students who realize that obtaining computational skills is beneficial to all fields of study, but who have little or no experience in programming or are not Computer Science majors. Students will be expected to create computer programs to solve problems in a range of disciplines.

Additional Information: Departmental Category: General Computer Science

CSCI 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an on-line virtual world called Second Life as the "Laboratory" for the course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the student to important ideas and concepts that shape the field of computer science.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 1220

Additional Information: Departmental Category: General Computer Science

CSCI 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather on the way in which computing has affected human culture and thought in the past half century.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 1240

Additional Information: Departmental Category: General Computer Science

CSCI 1300 (4) Computer Science 1: Starting Computing

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Intended for students with little to no experience in computing or programming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1310 or CSCI 1320 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 1310 (4) Computer Science 1: Starting Computing - Experienced

Intended for students with some prior experience in programming and basic knowledge of variables, conditionals, and loops. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1320 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 1320 (4) Computer Science 1: Starting Computing-Engineering Applications

Intended for students with no prior experience in programming. Class outcomes and goals are identical to CSCI 1300, but uses problems and tools from Engineering. Teaching techniques for writing computer programs in higher level programming languages to solve problems of interest in Engineering and other domains.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1310 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Restricted to College of Engineering or Pre-Engineering Arts and Science (PREN) majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 2270 (4) Computer Science 2: Data Structures

Studies data abstractions (e.g., stacks, queues, lists, trees) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

Requisites: Requires prerequisite courses of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1030 or ECEN 1310 and APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2400 (4) Computer Systems

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

Requisites: Requires prerequisite course of CSCI 2270 and a prerequisite or corequisite course of CSCI 2824 or ECEN 2703 or a prerequisite course of MATH 2001 or APPM 3170 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2820 (3) Linear Algebra with Computer Science Applications

Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2824 (3) Discrete Structures

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

Requisites: Requires prerequisite courses of CSCI 1200 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1030 or ECEN 1310 and APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 2830 (1-3) Special Topics in Computer Science

Covers topics of interest in computer science at the sophomore level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Computer Science

CSCI 2900 (1-3) Lower Division, Undergraduate Level Independent Study

Offers selected topics at the elementary level for students with little or no previous computing experience.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Computer Science

CSCI 3002 (3) HCC Foundations/User-Centered Design and Development 1

Introduces the practice and research of human-centered computing, including the evolution of human-computer interaction to its forms today and the techniques of user-centered design. Surveys topics that include social computing; tangible computing; mobility; and more. It will cover computing in society at large with respect to domains such as health, education, assistive technology, emergency response and environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3010 (3) Programming Project Workshop

A semester-long projects course guided by an instructor to help design and develop a programming project.

Requisites: Requires a prerequisite course of CSCI 2270 (minimum grade C-).

CSCI 3022 (3) Introduction to Data Science Algorithms

Introduces students to the tools methods and theory behind extracting insights from data using computer science algorithms. Covers algorithms that maximize likelihood objective functions; linear prediction algorithms; making decisions based on data assembled from large datasets; discovering and quantifying connections between observations in real-world data such as text and images; representing and manipulating data on a computer.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3100 (1) Software and Society

Provides students with an understanding of the professional, ethical, legal and social issues and responsibilities of software developers, as well as providing them with the ability to analyze the local and global impacts of computing on individuals, organizations and society.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4308 and CSCI 4328 and CSCI 4338 and CSCI 4348

Requisites: Requires prerequisite course of CSCI 3308 (minimum grade C-). Restricted to Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA, CSCI-ADL) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Computer Science

CSCI 3104 (4) Algorithms

Covers advanced data structures, computational geometry, cryptography, dynamic programming, greedy algorithms, divide-and-conquer, graph algorithms (e.g., depth-first search), network algorithms (e.g., shortest paths), approximation algorithms.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 and one of the following: CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 3112 (1-3) Human-Centered Computing Professional Development

Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 3112

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3155 (4) Principles of Programming Languages

Study fundamental concepts on which programming of languages are based, and execution models supporting them. Topics include values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Programming Languages

CSCI 3202 (3) Introduction to Artificial Intelligence

Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170 and one of the following: APPM 3570, 4570, 4520, CSCI 3022, MATH 3510, 4510, CVEN 3227, ECEN 3810, MCEN 4120 or ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3287 (3) Design and Analysis of Data Systems

Analyzes design of data systems, including data stored in file systems, database management systems and physical data organizations. Studies calculus of data models, query languages, concurrency and data privacy and security.

Requisites: Requires prerequisite course of CSCI 3104 (minimum grade C-).

Additional Information: Departmental Category: Database Systems

CSCI 3302 (3) Introduction to Robotics

Introduces students to fundamental concepts in autonomous, mobile robotics: mechanisms, locomotion, kinematics, control, perception and planning. The course consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3303

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3308 (3) Software Development Methods and Tools

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 3434 (3) Theory of Computation

Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions.

Requisites: Requires prerequisite courses of CSCI 3104 and CSCI 3155 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 3656 (3) Numerical Computation

Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Topics include floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration.

Requisites: Requires prerequisite courses of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 1360 or MATH 2300 and MATH 2130 or APPM 2360 or APPM 3310 or CSCI 2820 (all minimum grade C-).

Additional Information: Departmental Category: Numerical Computation

CSCI 3702 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3753 (4) Design and Analysis of Operating Systems

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

Requisites: Requires prerequisite courses of CSCI 2270 and either CSCI 2400 or ECEN 3350 (all minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 3832 (3) Machine Translation

Provides a comprehensive overview of current techniques in statistical machine translation of natural language, e., automatically translating from Spanish to English. Covers language models, reordering, hierarchical translation and evaluating whether a translation is effective.

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4229 (3) Computer Graphics

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5229

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Graphics

CSCI 4239 (3) Advanced Computer Graphics

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5239

Requisites: Requires prerequisite course of CSCI 4229 (minimum grade C-).

Additional Information: Departmental Category: Graphics

CSCI 4250 (3) Computer Science: The Canon

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count as CS credit for the Computer Science BA, BS or minor.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5250

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Computer Science

CSCI 4253 (3) Datacenter Scale Computing - Methods, Systems and Techniques

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5253

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CSCI 4273.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4273 (3) Network Systems

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5273 and ECEN 5273

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4302 (3) Advanced Robotics

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5302

Requisites: Requires prerequisite course of CSCI 3302 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4308 (4) Software Engineering Project 1

Advanced practicum in which students design, implement, document and test software systems for use in industry, non-profits, government and research institutions. Also offers extensive experience in oral and written communication throughout the development process. Department enforced prerequisite: successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 4448.

Additional Information: Departmental Category: Software Engineering

CSCI 4314 (3) Algorithms for Molecular Biology

Surveys molecular biology and combinatorial algorithms used to understand DNA, RNA and proteins. Students work in groups to define and tackle meaningful biological problems and learn to collaborate effectively with scientists in other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5314

Requisites: Requires a prerequisite course of CSCI 3104 (minimum grade C-).

Recommended: Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

Additional Information: Departmental Category: Theory of Computation

CSCI 4318 (4) Software Engineering Project 2

Second semester of an advanced practicum in computer science. Students must take this course and CSCI 4308 contiguously as the project spans the entire academic year.

Requisites: Requires prerequisite course of CSCI 4308 (minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 4328 (4) Software Project Management and Mentoring

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing and prototype goals. Study project risk management and cost estimation approaches. Experience mentoring Senior Software Project Team. Intended for professional software developers. Department consent required, see Senior Project Director for permission.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Software Engineering

CSCI 4338 (2) Software Project Management

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing, and prototype goals. Study project risk management and cost estimation approaches. Intended for double majors doing interdisciplinary projects in other departments.

Department consent required, see Senior Project Director for permission.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Software Engineering

CSCI 4348 (4) Startup Essentials: Entrepreneurial Projects in Computing

Provide students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept, and be evaluated on product/market fit. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. Formerly CSCI 4000.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5340

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 4358 (4) Entrepreneurial Projects II

Follows CSCI 4348. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5350

Requisites: Requires a prerequisite course of CSCI 4348 (minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4413 (3) Computer Security and Ethical Hacking

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5413

Requisites: Requires prerequisite course of CSCI 4273 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4446 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5446 and ECEN 4423 and ECEN 5423

Requisites: Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-).

Recommended: Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

Additional Information: Departmental Category: Numerical Computation

CSCI 4448 (3) Object-Oriented Analysis and Design

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5448

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 4502 (3) Data Mining

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5502

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4555 (3) Compiler Construction

Introduces the basic techniques used in translating programming languages: scanning, parsing, definition table management, operator identification and coercion, code selection and register allocation, error recovery. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5525 and ECEN 4553 and ECEN 5523

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 2400 or ECEN 3350 (all minimum grade C-).

Additional Information: Departmental Category: Programming Languages

CSCI 4576 (4) High-Performance Scientific Computing

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5576

Recommended: Prerequisite CSCI 3656.

Additional Information: Departmental Category: Numerical Computation

CSCI 4586 (4) High-Performance Scientific Computing 2

Introduces computing systems, software, and methods to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. Second course in a two-semester sequence.

Requisites: Requires prerequisite course of CSCI 4576 (minimum grade C-).

Additional Information: Departmental Category: Numerical Computation

CSCI 4593 (3) Computer Organization

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4593

Requisites: Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4753 (3) Computer Performance Modeling

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5753 and ECEN 4753 and ECEN 5753

Requisites: Requires prerequisite course of CSCI 3753 and MATH 2300 or APPM 1360 (all minimum grade C-).

Recommended: Requisite a course in statistics.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4802 (1) Data Science Team Companion Course

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5802

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of APPM 3310 or APPM 3570 or APPM 4520 or APPM 4570 or MATH 2130 or MATH 3510 or MATH 4510 or CSCI 2820 or CSCI 3022 or CVEN 3227 or ECEN 3810 or MCEN 4120 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5809 and ATLS 4809 and ATLS 5809

Additional Information: Departmental Category: Graphics

CSCI 4810 (1) Seminar in Computational Biology

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6810

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Computer Science

CSCI 4830 (1-3) Special Topics in Computer Science

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4831 (1-3) Special Topics in Algorithms

Covers topics of interest in computer science at the upper-division undergraduate level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of CSCI 3104 and CSCI 2820 or MATH 2130 or APPM 3310 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4900 (1-3) Upper Division, Undergraduate Level Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4950 (2-4) Senior Thesis

Provides an opportunity for senior computer science majors to conduct exploratory research in computer science. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of CSCI 3100 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: General Computer Science

CSCI 4960 (2-4) Computer Science Honors Thesis

Provides an opportunity for senior Computer Science majors to complete an honors thesis by conducting exploratory research in computer science. Department enforced prerequisites: successful completion of a minimum of 36 credit hours of Computer Science foundation and Computer Science electives and a writing requirement.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Computer Science

Computer Science - Bachelor of Arts (BA)

Overview of the Major

Computer science is an exciting and challenging field that has impact on many parts of our lives. Computer scientists craft the technologies that enable the digital devices we use every day. They develop the large-scale software that powers business and industry, and they advance the computational techniques and write the software that supports scientists in their study of the world around us. They create the software that social scientists use to identify and analyze patterns in the behavior of social groups and human behavior in social networks and the applications that humanists and linguists use to research language development. Many new applications of computing technology remain to be discovered.

Indeed, computing will be at the heart of future revolutions in business,

science, and society. Students who study computer science now will be at the forefront of those important advances.

Computer science is concerned with how computers are constructed, how they store and process data, how they are used in problem solving, and how the quality of those solutions is assessed. It is about the science of creating software for a variety of users. It is about understanding how that software interacts with the hardware on which it is run. Computer science goes well beyond the machine to the study of how people interact with the technologies around them. Applications of computer science reach far and wide.

Career Possibilities

Computer science graduates from the University of Colorado Boulder are engaged in a wide variety of jobs with many different companies in locations all over the world. They produce the software and systems that touch lives every day in fields ranging from communications to finance to publishing. They are, of course, software developers, but also have become teachers, writers, doctors, lawyers, scientists, military leaders, and entrepreneurs. They work at some of the largest, most influential companies in the world, at research institutions, non-profits, and at the smallest start-ups of every type imaginable. And many lead highly successful companies that they themselves have founded.

Career Services offers a number of programs and services designed to help you plan your career, including workshops, internships, and placement services after graduation. For an appointment with a career counselor or for more information, call 303-492-6541, or stop by the Center for Community. Find more information at Career Services (<http://www.colorado.edu/career>).

Facilities, Programs, and Opportunities

The Department of Computer Science uses a modern computing infrastructure that supports its research and educational missions. The department has a variety of computing facilities for use by faculty, staff, and students. These include general purpose computing labs provided by the university, additional instructional labs and administrative computing resources provided by the department, and specialized labs dedicated to the work of individual research groups. A wide variety of computing resources are available so that students have the opportunity to learn about and use cutting-edge equipment and software.

The Undergraduate Research Opportunities Program (UROP) offers students a chance to work alongside a faculty sponsor on original research. Learn to write proposals, conduct research, pursue creative work, analyze data, and present the results. For more information, call UROP at 303-492-2596 or visit the UROP website (<http://www.colorado.edu/suep/urop>). The Department provides networking opportunities throughout the year for students to meet with companies looking to hire students for paid internships. CU's location near Boulder's tech startup community, national research labs, and traditional tech companies such as Google, IBM, Oracle, Microsoft, and the like provide students with computer science skills a wide range of employment opportunities while working on earning their degrees.

Advising

If you would like to speak to an advisor about the BA in CS degree program Eva Lacy (eva.lacy@colorado.edu). Current A&S students may

also use the A&S advising website (<http://advising.colorado.edu>) to schedule an appointment with Eva.

A student may not earn both the BS in computer science from the College of Engineering and Applied Science and the BA in computer science from the College of Arts and Sciences. A student may not earn both a bachelor's degree in computer science and the minor in computer science from CU Boulder.

Required Courses and Credit Hours

Students must complete the general requirements of the College of Arts and Sciences, including approximately 46 credit hours in the core curriculum and the required courses listed below. Credit hours in the major may also apply toward these core courses.

Foundation

CSCI 1300	Computer Science 1: Starting Computing	4
or CSCI 1310	Computer Science 1: Starting Computing - Experienced	
CSCI 2270	Computer Science 2: Data Structures	4
CSCI 2400	Computer Systems	4
CSCI 2824	Discrete Structures (or other CS department approved Discrete Math course)	3

Core Courses

Select four of the following: 12-15

CSCI 3002	HCC Foundations/User-Centered Design and Development 1
CSCI 3104	Algorithms
CSCI 3155	Principles of Programming Languages
CSCI 3202	Introduction to Artificial Intelligence
CSCI 3287	Design and Analysis of Data Systems
CSCI 3308	Software Development Methods and Tools
CSCI 3434	Theory of Computation
CSCI 3656	Numerical Computation
CSCI 3753	Design and Analysis of Operating Systems
CSCI 4448	Object-Oriented Analysis and Design

Upper Division CSCI Electives

Three or four additional upper-division CSCI courses 12-15

Acillary Mathematics

Select one of the following Calculus sequences: 8-12

Sequence 1:	
APPM 1350	Calculus 1 for Engineers
& APPM 1360	and Calculus 2 for Engineers
Sequence 2:	
APPM 1340	Calculus 1 with Algebra, Part A
APPM 1345	Calculus 1 with Algebra, Part B
APPM 1360	Calculus 2 for Engineers
Sequence 3:	
MATH 1300	Calculus 1
& MATH 2300	and Calculus 2

Select one of the following courses in either Linear Algebra or Probability/Statistics: 3-4

Linear Algebra:	
APPM 3310	Matrix Methods and Applications
CSCI 2820	Linear Algebra with Computer Science Applications

MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors
Probability/Statistics:	
APPM 3570	Applied Probability
APPM 4570	Statistical Methods
ECON 3818	Introduction to Statistics with Computer Applications
MATH 3510	Introduction to Probability and Statistics
MATH 4510	Introduction to Probability Theory
Total Credit Hours	50-61

Graduating in Four Years

In order for the Four-Year Guarantee to apply, an arts and sciences student would need to have:

- Enrolled in the BA in computer science major and have taken Calculus 1 and CSCI 1300 (or CSCI 1310) by their second semester.

For more information, visit the department in Engineering Center, ECOT 717 or visit the Computer Science department (<http://www.colorado.edu/cs>) website.

Distributed Studies Program

Admission to the disciplinary and divisional track of distributed studies major requires completion of 60 credit hours or more, a one year break in a student's academic career, and permission from the College of Arts & Sciences dean's office. The distributed studies major is intended for returning students who have accumulated a significant number of credit hours toward the completion of one or more arts and sciences majors, are not eligible to continue in those majors, and have taken a break in their academic career.

An individually structured track also is available in the distributed studies major. Students pursuing the individually structured track must write and defend a thesis based on original scholarly or creative work.

For more information, contact the College of Arts and Sciences Academic Advising Center in Woodbury 109.

Ecology and Evolutionary Biology

Ecology seeks to understand the processes that control the abundance and distribution of organisms and how they interact with one another in a changing environment. Evolutionary biology provides a unifying conceptual framework for all of biology, including the characteristics of organisms and biological diversity. Taken together, ecology and evolutionary biology form a fundamental, broad, diverse and interdisciplinary area of scientific inquiry. Study in both areas is necessary for understanding the complex biological issues of today, including fighting diseases, understanding of the responses of life and humankind to Earth's changing environment and learning how species develop, thrive and decline. Also, ecology and evolutionary biology are working toward solving some of the world's most demanding problems, including sustainability and the future of life on earth, human health and welfare and wise stewardship of our planet. Students majoring in Ecology and Evolutionary Biology (EBIO) apply scientific approaches to issues in ecology and evolution, with an emphasis on critical evaluation of the literature, generating and testing hypotheses, designing and carrying out

experiments to test predictions and articulating, in oral or written form, the results of investigations.

In light of the broad importance of ecology and evolution for fundamental understanding of living systems, the undergraduate EBIO degree emphasizes knowledge and problem-solving in areas of:

- the ecology of organisms, populations and communities
- the distribution and function of terrestrial, freshwater and marine ecosystems
- principles and patterns of evolution, including natural selection and the history of life on Earth
- comparative, systematic, evolutionary and environmental aspects of botany, microbiology and zoology
- adaptation of organisms to the physical and biotic environment
- animal behavior and emotion
- molecular evolution and population genetics
- developmental biology and the evolution of development
- conservation biology and management of ecosystems
- the relevance of mathematics, chemistry and physics to biology
- the development of biological thought
- infectious disease ecology
- landscape and ecosystem ecology
- sustainability and human-nature systems
- energy and biofuels
- Darwinian medicine
- health and population genetics
- genetically engineered organisms

EBIO majors include students who:

- have strong and compelling interests in the natural world and who are interested in making a difference
- are interested in pursuing advanced graduate degrees in science, especially biology
- want careers in the areas of natural resources management, environmental consulting, environmental law, environmental science, science teaching and scientific journalism, among other professions
- are passionate about making a difference in the lives of others by improving their physical and mental health
- are interested in many different areas of biology, from the molecular to ecosystem levels
- are fascinated with the complexity and diversity of nature

A bachelor of arts (BA) degree in EBIO provides excellent training, education and experience, preparing students for many successful careers and for admission to and success in graduate study or medical school and other health professions:

- because ecology and evolution are subjects of central importance for understanding the ways all organisms live, grow and survive—everything from microbes to humans
- because the department and its classes provide students a broad learning experience in the biological sciences
- because the department's faculty provide EBIO majors with excellent classes and research opportunities

Course code for this program is EBIO.

Bachelor's Degree

- Ecology and Evolutionary Biology - Bachelor of Arts (BA) (p. 262)

Minor

- Ecology and Evolutionary Biology - Minor (p. 263)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, William (https://experts.colorado.edu/display/fisid_103612)
Professor; PhD, Australian National Univ (Australia)

Armstrong, David M.
Professor Emeritus

Barger, Nichole Nannette (https://experts.colorado.edu/display/fisid_131398)
Associate Professor; PhD, Colorado State University

Basey, John M (https://experts.colorado.edu/display/fisid_105539)
Senior Instructor; PhD, University of Nevada-Reno

Bekoff, Marc
Professor Emeritus

Bock, Carl L E.
Professor Emeritus

Bock, Jane H.
Professor Emeritus

Bonde, Erik K.
Professor Emeritus

Bowers, M Deane (https://experts.colorado.edu/display/fisid_101746)
Professor; PhD, University of Massachusetts at Amherst

Bowman, William D (https://experts.colorado.edu/display/fisid_105191)
Professor; PhD, Duke University

Breed, Michael D (https://experts.colorado.edu/display/fisid_103631)
Professor; PhD, University of Kansas

Carpenter, J Harrison (https://experts.colorado.edu/display/fisid_115915)
Senior Instructor; MS, Michigan Technological University

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Crumpacker, David W.
Professor Emeritus

Cruz, Alexander (https://experts.colorado.edu/display/fisid_100402)
Professor; PhD, University of Florida

Cundiff, Milford F (https://experts.colorado.edu/display/fisid_105396)
Associate Professor; PhD, University of Colorado Boulder

Davies, Kendi F (https://experts.colorado.edu/display/fisid_142304)
Associate Professor; PhD, Australian National Univ (Australia)

Demmig-Adams, Barbara (https://experts.colorado.edu/display/fisid_105649)
Professor; Dr habil, Univ of Wurzburg (Germany)

Emery, Nancy Christine (https://experts.colorado.edu/display/fisid_156291)
Assistant Professor; PhD, University of California-Davis

Fierer, Noah (https://experts.colorado.edu/display/fisid_142240)
Associate Professor; PhD, University of California-Santa Barbara

Flaxman, Samuel M (https://experts.colorado.edu/display/fisid_145698)
Associate Professor; PhD, Cornell University

Johnson, Pieter TJ (https://experts.colorado.edu/display/fisid_143590)
Associate Professor; PhD, University of Wisconsin-Madison

Kane, Nolan Coburn (https://experts.colorado.edu/display/fisid_151238)
Assistant Professor; PhD, Indiana University Bloomington

Kociolek, John Patrick (https://experts.colorado.edu/display/fisid_145728)
Professor; PhD, University of Michigan Ann Arbor

Lewis, William M (https://experts.colorado.edu/display/fisid_102314)
Professor; PhD, Indiana University Bloomington

Linhart, Yan B.
Professor Emeritus

Lynch, Carol B.
Professor Emeritus

Martin, Andrew (https://experts.colorado.edu/display/fisid_113238)
Professor; PhD, University of Hawaii at Manoa

Mayer, Stephanie Susan (https://experts.colorado.edu/display/fisid_114948)
Senior Instructor

McCain, Christy (https://experts.colorado.edu/display/fisid_145010)
Associate Professor; PhD, University of Kansas

McKenzie, Valerie J (https://experts.colorado.edu/display/fisid_142951)
Assistant Professor; PhD, University of California-Santa Barbara

Medeiros, Daniel Meulemans (https://experts.colorado.edu/display/fisid_145697)
Associate Professor; PhD, California Institute of Technology

Melbourne, Brett Andrew (https://experts.colorado.edu/display/fisid_144966)
Associate Professor; PhD, Australian National Univ (Australia)

Mitton, Jeffrey B (https://experts.colorado.edu/display/fisid_101058)
Professor; PhD, SUNY at Stony Brook

Monson, Russell K.
Professor Emeritus

Nichols, Harvey
Professor Emeritus

Safran, Rebecca J (https://experts.colorado.edu/display/fisid_145518)
Associate Professor; PhD, Cornell University

Schmidt, Steve (https://experts.colorado.edu/display/fisid_103713)
Professor; PhD, Cornell University

Seastedt, Timothy (https://experts.colorado.edu/display/fisid_103519)
Professor; PhD, University of Georgia

Smith, Stacey Dewitt (https://experts.colorado.edu/display/fisid_153407)
Assistant Professor; PhD, University of Wisconsin-Madison

Stock, David W (https://experts.colorado.edu/display/fisid_113762)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Suding, Katharine Nash (https://experts.colorado.edu/display/fisid_116718)
Professor; PhD, University of Michigan Ann Arbor

Townsend, Alan Ronald (https://experts.colorado.edu/display/fisid_107584)
Professor; PhD, Stanford University

Tripp, Erin Anne (https://experts.colorado.edu/display/fisid_152313)
Assistant Professor; PhD, Duke University

Wessman, Carol A (https://experts.colorado.edu/display/fisid_100909)
Professor; PhD, University of Wisconsin-Madison

Windell, John T.
Professor Emeritus

Winston, Paul W.
Professor Emeritus

EBIO 1010 (3) Introduction to Quantitative Thinking for Biologists

Focuses on the collection, visualization and analysis of data that are relevant for advancing critical thinking, student-directed learning, and the development of quantitative analysis skills, with an emphasis on using R and examples from ecology and evolutionary biology.

Grading Basis: Letter Grade

EBIO 1030 (3) Biology: A Human Approach 1

Lect. Studies the principles of biology and their implications. Central theme is humans and the environment, emphasizing ecology, natural resource conservation, and the interrelatedness of a growing human population. Recommended for nonscience majors.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
MAPS Course: Natural Science

EBIO 1040 (3) Biology: A Human Approach 2

Lect. Continues EBIO 1030, focusing on the function of the human body, and maintenance of dynamic equilibrium in the internal environment in the face of a continually changing external environment. Discusses factors influencing these homeostatic conditions and how and why they change. Recommended for nonscience majors.

Recommended: Prerequisite EBIO 1030 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Sequence

EBIO 1050 (1) Biology: A Human Approach Laboratory

One two-hour lab per week. Provides experiments and exercises relating to concepts presented in EBIO 1030 and EBIO 1040. Uses animals and/or animal tissues. Recommended for nonscience majors. When taken with EBIO 1030, meets the MAPS requirement for natural science: lab.

Additional Information: Arts Sci Core Curr: Natural Science Lab
MAPS Course: Natural Science Lab or Lab/Lec

EBIO 1210 (3) General Biology 1

Lect. Provides a concentrated introduction to molecular, cellular, genetic, and evolutionary biology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Natural Science

EBIO 1220 (3) General Biology 2

Provides a concentrated introduction to organisms, homeostasis, development, behavior, and ecology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

Recommended: Prerequisite EBIO 1210 (minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

EBIO 1230 (1) General Biology Laboratory 1

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 1. Intended for science majors.

Recommended: Prerequisite or corequisite EBIO 1210 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science

EBIO 1240 (1) General Biology Laboratory 2

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 2. Intended for science majors.

Recommended: Prerequisite or corequisite EBIO 1220 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

EBIO 1300 (1-3) Topics in Biological Sciences

Covers special topics in biology for freshmen or nonmajors. Introduces scientific methods and principles in biology, as well as issues of current interest in biology. Does not count toward the major in EBIO.

EBIO 1940 (3) College Writing for Science Students

Introduces first year students to college writing, focusing on developing academic research and writing skills of particular interest to science students. Emphasizes habits of mind in topic invention, drafting, revision and writing style, as well as critical thinking and information literacy.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Arts Sci Core Curr: Written Communication

EBIO 2010 (1-3) Environmental Issues and Biology

Lect. Describes how the natural environment is currently stressed by a variety of human actions. Examines the nature of these environmental problems and their impact on living organisms, both human and nonhuman species.

EBIO 2040 (4) Principles of Ecology

Lecture and laboratory. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2640 and ENVS 2000

Recommended: Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 2070 (4) Genetics: Molecules to Populations

Lect. and rec. Covers principles of genetics and developmental biology at levels of molecules, cellular organelles, individuals and populations; asexual and sexual life cycles; heredity. Recitations allow discussion of genetics problems and implications of genetic principles and provide demonstrations and simulations of genetic processes. Intended for sophomore majors in EBIO.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2640

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Sequence

EBIO 2090 (3) Tropical Island and Marine Ecology

Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, dispersal, colonization, physiology and adaptations. Includes study of beach and coral formation, island organisms and their population dynamics. Students may also register for an optional 1 credit, one week, tropical island and coral reef trip that complements the lecture portion of the class but has an additional cost.

Recommended: Prerequisite EBIO 1220 (minimum grade C-).

EBIO 2091 (3) Field Studies in Marine and Island Ecology and Oceanography

Investigates tropical island and marine ecology as well as all four disciplines of oceanography. A three-credit course focused on a tropical island ecology and oceanography field trip that complements the lecture portion of EBIO 2090 and ATOC 3070 with an additional cost. Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, study of beach and coral formation, island formation, organisms and their population dynamics. The course consists of a one-week field trip to the Keys Marine Laboratory in the Florida Keys and once-weekly class room meeting (of variable duration from 1-4 hours) throughout the semester.

Requisites: Requires a corequisite course of EBIO 2090 or ATOC 3070 or GEOL 3070.

Grading Basis: Letter Grade

EBIO 2640 (5) Honors Principles of Ecology

Lect., lab, and rec. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2040 and ENVS 2000

Recommended: Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

Additional Information: Arts Sciences Honors Course

EBIO 2840 (1-6) Independent Study: Lower Division

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EBIO 3010 (1-2) Teaching Biology

Provides an opportunity to assist in teaching of specific lecture or laboratory section in EBIO under direct faculty supervision. Students must first make arrangements with the appropriate faculty member and turn in a form to the EBIO office.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

EBIO 3040 (4) Conservation Biology

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3040

Recommended: Prerequisite EBIO 2040 or EBIO 2640 or ENVS 2000 (minimum grade C-).

EBIO 3080 (4) Evolutionary Biology

Lect. and lab. Emphasizes the fundamental evolutionary concepts that provide explanations for the diversification of life on Earth. Specific topics include the evidence for evolution, adaptation by natural selection, speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and processes. Recitations allow students to explore specific topics in more depth and smaller groups.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 3680

Recommended: Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

EBIO 3110 (3) Population and Community Ecology

Presents principles of ecology that relate to the niche, population growth, metapopulations, population interactions (within and between trophic levels), community structure and development, landscape ecology and species diversity.

Recommended: Prerequisite EBIO 1240 or EBIO 2640 (minimum grade C-).

EBIO 3170 (3) Mountain Ecology and Conservation

Focuses on the ecology of mountain environments around the world, including climatic gradients, plant and animal diversity and distributions, habitat zonation, evolutionary processes, and various aspects of montane conservation from habitat change to climate change.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 (minimum grade C-).

EBIO 3180 (3) Global Ecology

Lect. Involves study of ecological principles and problems at the biosphere level. Presents a worldwide approach to populations, biotic resources, ecologic interactions, land use, deforestation, desertification, species extinctions, pollution, environmental quality, global change, and environmental ethics.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

EBIO 3190 (3) Tropical Marine Ecology

Lect. Examines the biology and ecology of marine ecosystems, emphasizing those occurring in tropical regions such as coral reefs. Studies how these ecosystems are changing and the future impact of human stress on the marine environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite any two-semester introductory biology course.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

EBIO 3240 (4) Animal Behavior

Lect. and lab. Topics include basic concepts and history, methods of study, ethical issues, neurobiology, behavior, the development of behavior, predator-prey relationships, communication, aggression and dominance, mating systems, cognitive ethology, and parental care. When possible, life-history strategies, the evolution of behavior, and behavioral ecology are stressed. Uses animals and animal tissues.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3270 (3) Ecosystem Ecology

Integrates information from physics (e.g., energetics), chemistry (the behavior of basic elements), and biology (evolutionary traits of species, multiple photosynthetic pathways, etc.) to understand the structure and functioning of ecosystems. Provides the background and necessary information to understand controls on photosynthesis, decomposition, and nutrient cycling across diverse terrestrial and aquatic landscapes.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 (minimum grade C-).

EBIO 3400 (3) Microbiology

Surveys distinguishing characteristics of microorganisms based on structural-functional relationships, taxonomy, growth and physical-chemical agents of control including antibiotics, metabolism and genetics. Introduces applied microbiology emphasizing infectious diseases, basic concepts of immunology and microbial ecology. Uses animals and/or animal tissues.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3410 (1) Microbiology Lab

Accompanies EBIO 3400.

Requisites: Requires a prerequisite or corequisite course of EBIO 3400 (minimum grade D-).

Grading Basis: Letter Grade

EBIO 3590 (4) Plants and Society

A writing intensive course for majors and non-majors which acquaints students with the history of plant use in our society. Topics center on the evolving relationship between humans and plants as food sources, medicines, fuel, and other products, such as fibers and dyes.

Grading Basis: Letter Grade

EBIO 3630 (4) Parasitology

Lect. and lab. Surveys animal parasites, including life histories; emphasizes parasites of humans. Uses animals and/or animal tissues.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3680 (5) Honors Evolutionary Biology

Lect., rec., and co-sem. Emphasizes the fundamental evolutionary concepts that provide explanation for the diversification of life on Earth. Specific topics include the evidence for evolution, adaptation by natural selection speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and process. Recitations allow students to explore specific topics in more depth and smaller groups.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 3080

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2070 (minimum grade C-).

Additional Information: Arts Sciences Honors Course

EBIO 3850 (4) Animal Diversity: Invertebrates

Lect. and lab. Offers a broad study of the biology of the most diverse group of organisms on Earth. Areas include ecology, physiology, evolution and morphology of aquatic and terrestrial forms. Uses animals and/or animal tissues.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3930 (1-6) Internship

Provides an academically supervised opportunity for upper-division students to work in public or private organizations. Projects are usually related to students' career goals. Each project has both academic and work components. Pass/fail only.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

EBIO 3940 (3) Written Communication in the Sciences

Focuses upon communication commonly practiced by scientists, with special emphasis on writing. Directs attention to scientists' strategic use of written arguments, statistical data and visual representations. Prepares students for communication tasks within advanced study and professional work.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Written Communication

EBIO 3980 (1) Seminar: Introduction to EBIO Honors

Presents an introduction to the departmental Honors program. Consists of a lecture component on Honors research, thesis, and defense, as well as a seminar component where students present the findings of their library research, conducted under guidance of a faculty mentor, and hear presentations by graduating Honors candidates on their thesis research.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites minimum 3.2 GPA and a declared EBIO major and approval by departmental honors committee.

Additional Information: Arts Sciences Honors Course

EBIO 3990 (1-3) EBIO Honors Thesis Research

Provides an introduction to the departmental Honors program. Consists of individual library research on a potential Honors thesis topic under the guidance of a faculty mentor.

Requisites: Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

Recommended: Prerequisites minimum 3.2 GPA and approval by departmental honors committee.

EBIO 4030 (3) Limnology

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5030

Recommended: Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

EBIO 4060 (3) Landscape Ecology

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5060

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4070 (3) DNA Methods in Ecology and Conservation Biology

Acquiring skill with molecular methods in ecology and conservation biology is most quickly accomplished with hands-on experience.

Combines classroom lectures with collecting in the field and laboratory exercises to provide experience extracting DNA, amplifying DNA with the Polymerase Chain Reaction (PCR), designing PCR primers, sequencing DNA and editing and aligning sequences with the Sequencher software.

Requisites: Requires prerequisite course of EBIO 2070 (minimum grade C).

Grading Basis: Letter Grade

EBIO 4080 (4) Freshwater Phycology

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5080

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4090 (2) Coral Reef Ecology

Includes one week of lectures in Boulder and one week of field studies on one of the most complex and beautiful ecosystems in the world, the Caribbean reefs at Cozumel, Mexico. Two week, fall-semester course beginning after Christmas. Scuba certification required.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite any ecology course is a highly recommended.

EBIO 4100 (3) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5100

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4120 (2-4) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4140 (3) Plant Ecology

Examines the relationships between plants and their physical and biological environments, encompassing physiology, competition, plant-soil and plant-animal interactions, population dynamics, diversity, and influence on ecosystem function.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4150 (1-2) Techniques in Ecology

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5150

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4160 (3) Introduction to Biogeochemistry

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4160 and GEOL 4160

Recommended: Prerequisites GEOL 3320 or EBIO 3270 and CHEM 1011 (minimum grade C-).

EBIO 4175 (3) The Scientific Basis for Ecosystem Management of Public Lands

An advanced field ecology course emphasizing measurements, statistical procedures and biotic data information management relevant to land management issues. Develops concepts of adaptive ecosystem management using ongoing field studies on public land in the Colorado Front Range.

Recommended: Prerequisites EBIO 3270 and EBIO 4500 (minimum grade C-).

EBIO 4270 (3) Population Genetics

Provides an in-depth introduction to population genetics. Lectures and discussions will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. Following an introduction to population genetic theory, we will investigate current topics in the field.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5270

Requisites: Requires prerequisite courses of EBIO 2070 and EBIO 3080 (all minimum grade C-).

Grading Basis: Letter Grade

EBIO 4290 (4) Phylogenetics and Comparative Biology

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5290

Recommended: Prerequisite EBIO 3080 (minimum grade C-) or instructor consent required.

Grading Basis: Letter Grade

EBIO 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5340 and ENVS 4340 and ENVS 5340

Recommended: Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

EBIO 4410 (4) Biometry

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5410

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4420 (3) Computational Biology

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5420

Grading Basis: Letter Grade

EBIO 4440 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5440 and MCDB 4441 and MCDB 5441

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

EBIO 4460 (1-5) Special Topics

Familiarizes students with specialized areas of biology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5460

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4500 (4) Plant Biodiversity and Evolution

Lect. and lab. Surveys plant types emphasizing diagnostic features of plants in general and major taxa in particular. Focuses on identity, morphology, anatomy, reproduction, ecology, geography, evolution, fossil record, and economic use of taxa.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4510 (4) Plant Anatomy and Development

Lect. and lab. Introduces structures of seed plants, especially angiosperms, and developmental history of these structures. Studies cell types, and their location and function in plant tissues and organs. The laboratory provides an opportunity to examine plant tissues and to prepare tissues for examination by the light microscope. Stresses role of plant structures in the living plant.

Recommended: Prerequisites, EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4520 (4) Plant Systematics

Lect. and lab. Studies the principles and techniques of modern systematics of organisms, illustrated with examples from the plant kingdom, usually the angiosperms. Framework of course is evolutionary and ecological, as well as taxonomic.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5520

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

EBIO 4530 (4) Functional Plant Biology

Lect. and lab. Explores mechanisms of plant functioning and how such functioning relates to the performance of the plant under different environmental conditions. Phenomena include water relations, growth and development, and metabolic processes including photosynthesis, respiration, and responses to stress.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4550 (4) Plant Eco-Evo-Devo

Explores the fundamental principles of plant form from the perspectives of ecological function, evolutionary origin, and developmental dynamics. Students are presented with conceptual and analytical tools to interpret the vast diversity of growth form-function relationships that exist among plants. Laboratory sessions apply concepts presented in lecture and students will engage in original research using light and scanning electron microscopy.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4600 (4) Evolutionary Ecology

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5600

Requisites: Requires prerequisite courses of EBIO 2040 and EBIO 3080 (all minimum grade C-).

Grading Basis: Letter Grade

EBIO 4640 (2-4) Plant Field Studies

Includes field-oriented courses offered at irregular intervals during the academic year or during summer sessions.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 2040 and EBIO 2640 (minimum grade C-).

EBIO 4660 (4) Insect Biology

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5660

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4740 (3) Biology of Amphibians and Reptiles

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5740

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4750 (4) Ornithology

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5750

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5760 and MUSM 5760

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 and EBIO 2640 (minimum grade C-).

EBIO 4800 (3) Critical Thinking in Biology

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5800

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite minimum of 14 hours of EBIO course work.

EBIO 4840 (1-6) Independent Study: Upper Division

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EBIO 4860 (1-2) Critical Thinking in Biology - Lab**EBIO 4870 (1-6) Independent Research: Upper Division**

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EBIO 4980 (1) Seminar: EBIO Honors Thesis

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

Recommended: Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental honors committee.

Additional Information: Arts Sciences Honors Course

EBIO 4990 (1-3) EBIO Honors Thesis Research

To be taken during the final academic year prior to graduation. Consists of the final phase of honors research and thesis preparation under the guidance of a faculty mentor.

Requisites: Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

Recommended: Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental Honors program.

Additional Information: Arts Sciences Honors Course

Ecology and Evolutionary Biology - Bachelor of Arts (BA)

The undergraduate program in ecology and evolutionary biology offers a highly interactive, intellectual environment that prepares students for a career in the natural sciences.

Our program was specifically designed for students who are interested in a broad exposure to the concepts and methodologies of the biological sciences, as well as those interested in a more specific sub-discipline.

We offer a broad range of learning opportunities, including traditional classroom experiences, field and laboratory research opportunities, and independent study.

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in ecology and evolutionary biology, in addition to completing all the current requirements for the BA with a major in ecology and evolutionary biology at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Concurrent Degree Program

BA/MA in Ecology and Evolutionary Biology

A combined bachelor's (BA) and master's (MA) degree with thesis is offered for highly motivated undergraduate students. The BA/MA program allows students to take advanced courses at an accelerated pace, engage in an independent research project and obtain both degrees in five years. In addition to preparing graduates for additional graduate study or medical school, the program is expected to position them for employment in areas such as environmental consulting, teaching at the high school or community college level or by businesses with an environmental or biomedical emphasis. Applications from sophomores and juniors for the BA/MA degree are considered on a competitive basis. Applicants must have an overall GPA of 3.00 or higher in the EBIO major and the support of a faculty research advisor. Applications are available from the EBIO graduate coordinator, and are due on October 15 and March 15.

Candidates for this degree must complete all college core requirements by the end of the senior year. To be awarded both BA and MA degrees, a student must maintain a GPA of 3.00 or better and complete at least 144 credit hours. The BA/MA program requires 24 hours of graduate credit at the 5000-level or above and 4–6 hours of thesis credit. In addition to writing a thesis based on original research, students are examined by their thesis committee in the fifth year on general knowledge in ecology and/or evolutionary biology. The final examination consists of a defense of the thesis before the committee; it should be scheduled by the end of the fifth year.

Students interested in this program are encouraged to consult with the EBIO associate chair for graduate studies early in their undergraduate career. No financial support is available from the department for students enrolled in this program.

Required Courses and Credit Hours

In addition to the general College of Arts and Sciences requirements, students in EBIO must complete 12-15 credit hours selected from chemistry, physics and mathematics, plus a statistics course and 38 credit hours of course work in EBIO.

Up to 12 credit hours of courses taken in other departments may be counted toward the 38 credit hours required for the EBIO major. A list of acceptable courses can be obtained from the EBIO advisor. A maximum of 6 credit hours of Independent Study/Research may be applied toward the major. A maximum of 6 credit hours of internship may be applied toward the major.

Students with scores of 4 or 5 on the AP biology test receive 8 hours of credit and are exempt from the general biology sequence (EBIO 1210 and EBIO 1220, and EBIO 1230 and EBIO 1240). Students who score in the 66th percentile or higher on the CLEP test in biology receive 6 hours of credit and are exempt from EBIO 1210 and EBIO 1220.

EBIO majors with transfer credit in biology from other institutions or advanced placement credits must consult with the EBIO undergraduate advisor. Transfer students must complete at least 12 upper-division (3000-level or above) EBIO credit hours on the Boulder campus.

All required courses must be completed with a grade of C- or better.

Required Courses

EBIO 1210	General Biology 1	4
& EBIO 1230	and General Biology Laboratory 1	
EBIO 1220	General Biology 2	4
& EBIO 1240	and General Biology Laboratory 2	
EBIO 2040	Principles of Ecology	4
EBIO 2070	Genetics: Molecules to Populations	4
EBIO 3080	Evolutionary Biology	4
One EBIO laboratory or field course, 3000 level or above. Possible choices include:		3-4

EBIO 3170	Mountain Ecology and Conservation
EBIO 3240	Animal Behavior
EBIO 3400	Microbiology
EBIO 3630	Parasitology
EBIO 3850	Animal Diversity: Invertebrates
EBIO 4100	Advanced Ecology
EBIO 4500	Plant Biodiversity and Evolution
EBIO 4510	Plant Anatomy and Development
EBIO 4520	Plant Systematics
EBIO 4660	Insect Biology
EBIO 4750	Ornithology
EBIO 4760	Mammalogy

EBIO 4000-level or above (at least 6 credit hours). Possible choices include: ¹ 6

EBIO 4030	Limnology
EBIO 4060	Landscape Ecology
EBIO 4140	Plant Ecology
EBIO 4100	Advanced Ecology
EBIO 4160	Introduction to Biogeochemistry
EBIO 4175	The Scientific Basis for Ecosystem Management of Public Lands
EBIO 4290	Phylogenetics and Comparative Biology
EBIO 4410	Biometry
EBIO 4740	Biology of Amphibians and Reptiles
EBIO 4800	Critical Thinking in Biology
EBIO 4840	Independent Study: Upper Division
EBIO 4870	Independent Research: Upper Division

Electives

EBIO electives to bring total in major to 38 credit hours 8-9

Statistics: ²

EBIO 1010	Introduction to Quantitative Thinking for Biologists
MATH 2510	Introduction to Statistics
MATH 3510	Introduction to Probability and Statistics
IPHY 2800	Introduction to Statistics
PSYC 2111	Psychological Science I: Statistics
EBIO 4410	Biometry

Ancillary Course Work

Select three of the following: 12-15

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1 ³
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2 ³
PHYS 1110	General Physics 1 (calculus-based)
PHYS 2010	General Physics 1 (algebra-based)
PHYS 1120 & PHYS 1140	General Physics 2 and Experimental Physics 1 (calculus-based) ³
PHYS 2020	General Physics 2 (algebra-based)
MATH 1300	Calculus 1
	or MATH 1310 Calculus, Systems, and Modeling
	or APPM 1300 Calculus 1 for Engineers
MATH 2300	Calculus 2
	or APPM 1360 Calculus 2 for Engineers

Total Credit Hours 49-54

¹ These 6 credit hours must include one course taken at the CU Boulder campus or Mountain Research Station and may include a maximum of 3 credit hours of independent study or independent research.

² Of these, only EBIO 4410 counts toward the 38 credit hours of EBIO required for the major.

³ Students must take the lecture and lab for these courses.

Ecology and Evolutionary Biology - Minor

A minor is offered in ecology and evolutionary biology. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

We offer a broad range of learning opportunities, including traditional classroom experiences, field and laboratory research opportunities, and independent study.

Required Courses and Credit Hours

Students must complete:

- A total of 20 credit hours in EBIO with grades of C- or better.
- A 2.00 GPA or higher for all course work attempted in EBIO.
- 9 hours of upper-division credit in EBIO.
- 6 hours of 4000-level credit in EBIO.
- A minimum of 12 credit hours must be taken on the Boulder campus, including a minimum of 6 of the 9 upper-division credit hours. Mountain Research Station is considered the Boulder campus.
- Up to 3 credit hours of any combination of the following can count toward the EBIO minor: Independent study, Independent research or internship credit.

All courses must have an EBIO prefix. EBIO 1030, EBIO 1040, EBIO 1050, EBIO 1300 and EBIO 3010 do not count toward the minor requirement.

Required Courses

EBIO 1210	General Biology 1	4
& EBIO 1230	and General Biology Laboratory 1	

EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	4
Electives		
Complete 3 credit hours of lower- or upper-division EBIO courses		3
Complete 3 credit hours of 3000- or 4000-level EBIO courses		3
Complete 6 credit hours of 4000-level EBIO courses		6
Total Credit Hours		20

Economics

The undergraduate degree in economics emphasizes knowledge and awareness of:

- the conditions for efficiency in free market production and exchange;
- contemporary theories concerning economic growth, inflation, unemployment, distribution of income and international environment;
- specialized fields of economics, such as international economics and finance, natural resources and environment, the economics of gender and discrimination and public economics;
- the descriptive statistics commonly used by economists; and
- the institutional characteristics of the US economy, and how these differ from those in other economies.

In addition, students completing the degree in economics are expected to acquire the ability and skills to:

- apply the tools of microeconomic theory to reach sound conclusions for simple economic problems;
- follow arguments concerning macroeconomic theory to distinguish between sound and fallacious reasoning and to understand how differences in policy prescription may arise;
- perform statistical analysis such as multiple regression and understand similar analyses performed by others; and
- communicate economic reasoning in writing, understand similar writing by others and appreciate the diversity of views that may reasonably exist about economic problems.

Course code for this program is ECON.

Economics Honors Program

The honors program in economics provides an opportunity for highly motivated majors to undertake individualized research and to graduate with honors (*cum laude*, *magna cum laude*, *summa cum laude*) in economics. Economics majors with senior standing and both economics and overall GPAs of 3.40 or better are eligible to participate. Participants enroll in the economics honors seminars, which provide instruction in research methodology essential to the preparation of the honors thesis. Students interested in the economics honors program should contact the departmental honors advisor during their junior year.

Bachelor's Degree

- Economics - Bachelor of Arts (BA) (p. 270)

Minor

- Economics - Minor (p. 271)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Antman, Francisca Marie (https://experts.colorado.edu/display/fisid_144606)
Associate Professor; PhD, Stanford University

Baranov, Oleg Valeryevich (https://experts.colorado.edu/display/fisid_149617)
Assistant Professor; PhD, University of Maryland College Park Campus

Barham, Tania C.J. (https://experts.colorado.edu/display/fisid_140077)
Associate Professor; PhD, University of California-Berkeley

Boileau, Martin (https://experts.colorado.edu/display/fisid_113872)
Professor; PhD, Queen's Univ, Kingston (Canada)

Burr, Chrystie (https://experts.colorado.edu/display/fisid_152969)
Assistant Professor; PhD, University of Arizona

Cadena, Brian C (https://experts.colorado.edu/display/fisid_145740)
Associate Professor; PhD, University of Michigan Ann Arbor

Carballo, Jeronimo Rafael (https://experts.colorado.edu/display/fisid_155949)
Assistant Professor; PhD, University of Maryland College Park Campus

Carlos, Ann M (https://experts.colorado.edu/display/fisid_105534)
Professor; PhD, Univ of Western Ontario (Canada)

Chen, Yongmin (https://experts.colorado.edu/display/fisid_108989)
Professor; PhD, Boston University

De Bartolome, Charles A M (https://experts.colorado.edu/display/fisid_101302)
Professor; PhD, University of Pennsylvania

Flores, Nicholas E (https://experts.colorado.edu/display/fisid_107603)
Professor; PhD, University of California-San Diego

Glahe, Fred R.
Professor Emeritus

Graves, Philip E (https://experts.colorado.edu/display/fisid_102050)
Professor; MA, Northwestern University

Greenwood, Michael J.
Professor Emeritus

Howe, Charles W.
Professor Emeritus

Hsiao, Frank S. T.
Professor Emeritus

Hughes, Jonathan Edward (https://experts.colorado.edu/display/fisid_147335)
Assistant Professor; PhD, University of California-Davis

Iyigun, Fevzi Murat (https://experts.colorado.edu/display/fisid_118373)
Professor; PhD, Brown University

Jobin, Nicole V (https://experts.colorado.edu/display/fisid_103920)
Instructor; PhD, University of Colorado Boulder

Kaempfer, William H (https://experts.colorado.edu/display/fisid_102376)
Professor; PhD, Duke University

Kaffine, Daniel Thomas (https://experts.colorado.edu/display/fisid_153280)
Associate Professor; PhD, University of California-Santa Barbara

Kaplan, Jules Gordon (https://experts.colorado.edu/display/fisid_106077)
Instructor; PhD, University of Colorado Boulder

Keller, Wolfgang (https://experts.colorado.edu/display/fisid_141891)
Professor; PhD, Yale University

Kim, Jin-Hyuk (https://experts.colorado.edu/display/fisid_149615)
Assistant Professor; PhD, Cornell University

Lillydahl, Jane
Professor Emeritus

Liu, Xiaodong (https://experts.colorado.edu/display/fisid_144508)
Associate Professor; PhD, Ohio State University

Markusen, James R (https://experts.colorado.edu/display/fisid_103187)
Distinguished Professor; PhD, Boston College

Martins-Filho, Carlos B (https://experts.colorado.edu/display/fisid_147510)
Professor; PhD, University of Tennessee-Knoxville

Maskus, Keith E (https://experts.colorado.edu/display/fisid_103414)
Professor; PhD, University of Michigan Ann Arbor

McKinnish-Harlee, Terra Greenw (https://experts.colorado.edu/display/fisid_115558)
Professor; PhD, Carnegie Mellon University

Mertens, William G (https://experts.colorado.edu/display/fisid_105762)
Instructor; PhD, University of Colorado Boulder

Morey, Edward R (https://experts.colorado.edu/display/fisid_102256)
Professor; PhD, Univ of British Columbia (Canada)

Owen, Wyn F.
Professor Emeritus

Poulson, Barry
Professor Emeritus

Rondina, Giacomo (https://experts.colorado.edu/display/fisid_154419)
Assistant Professor; PhD, University of Wisconsin-Madison

Roper, Don E.
Professor Emeritus

Savage, Scott James (https://experts.colorado.edu/display/fisid_121239)
Associate Professor; PhD, Curtin Univ of Tech (Western Australia)

Shiue, Carol Hua (https://experts.colorado.edu/display/fisid_141892)
Associate Professor; PhD, Yale University

Singell, Larry D.
Professor Emeritus

Udis, Bernard
Professor Emeritus

Waldman, Donald M (https://experts.colorado.edu/display/fisid_100468)
Professor; PhD, University of Wisconsin-Madison

Zax, Jeffrey S (https://experts.colorado.edu/display/fisid_100898)
Professor; PhD, Harvard University

Zhang, Shuang (https://experts.colorado.edu/display/fisid_151517)
Assistant Professor; PhD, Cornell University

ECON 1078 (3) Mathematical Tools for Economists 1

Teaches mathematical skills and logical thinking for use in economics. Topics include algebra, graphs, functions, and probability. Includes many "Real world" examples and some illustrative computer assignments.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Quantitative Economics

ECON 1088 (3) Mathematical Tools for Economists 2

Continuation of ECON 1078. Teaches mathematical skills for use in economics. Topics include derivatives, optimization and integration. These skills are used on "real world" problems and illustrated with computer assignments. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Quantitative Economics

ECON 2010 (4) Principles of Microeconomics

Examines basic concepts of microeconomics or the behavior and the interactions of individuals, firms and government. Topics include determining economic problems, how consumers and businesses make decisions, how markets work, and how they fail and how government actions affect markets.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Theory and History of Economic Thought
MAPS Course: Social Science

ECON 2020 (4) Principles of Macroeconomics

Provides an overview of the economy, examining the flows of resources and outputs and the factors determining the levels of income and prices. Explores policy problems of inflation, unemployment and economic growth.

Requisites: Requires prerequisite course of ECON 2010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Theory and History of Economic Thought
MAPS Course: Social Science

ECON 3070 (4) Intermediate Microeconomic Theory

Explores theory and application of models of consumer choice, firm and market organization, and general equilibrium. Extensions include intertemporal decisions, decisions under uncertainty, externalities, and strategic interaction.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 3080 (3) Intermediate Macroeconomic Theory

Introduces theories of aggregate economic activity including the determination of income, employment, and prices; economic growth; and fluctuations. Macroeconomic policies are explored in both closed and open economy models. ECON 3070 and 3080 may be taken in any order; there is no recommended sequence.

Requisites: Requires prerequisite courses of ECON 2020 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 3403 (3) International Economics and Policy

Examines national and supranational policies that affect the international economy, with attention to trade barriers, economic nationalism and regionalism, international political economy, exchange market intervention, and international transmission of economic perturbations. Credit given in this course is not included in the calculation of an economics major GPA. May not be taken after either ECON 4413 or ECON 4423.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: International Trade and Finance

ECON 3535 (3) Natural Resource Economics

Integrates economic analysis with life science aspects of natural resource systems to develop social policies for use of natural resources. Studies economists' approaches to resources policy analysis and applies them to energy, forestry, fisheries, mineral and water systems. Credit given in this course is not included in the calculation of an economics major GPA.

Equivalent - Duplicate Degree Credit Not Granted: ECON 4535

Requisites: Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Natural Resources and Environmental Economics

ECON 3545 (3) Environmental Economics

Highlights causes of excessive environmental pollution and tools for controlling it through economic analysis, values of preservation and distribution of costs and benefits from environmental protection programs. Credit given in this course is not included in the calculation of an economics major GPA.

Equivalent - Duplicate Degree Credit Not Granted: ECON 4545

Requisites: Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Natural Resources and Environmental Economics

ECON 3616 (3) Employment, Wages and the Future of Work

Examines how automation, globalization and information technology are changing which jobs get done, by whom and how much they pay. Illustrates how basic labor supply and demand theory helps predict the impact of technological progress on occupational composition, income inequality and the nature of work itself. These theoretical tools also guide our search for appropriate public policy responses. Credit given in this course is not included in the calculation of an economics major GPA.

Requisites: Requires a prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are excluded from taking this course. ECON minors are allowed to enrolled.

Additional Information: Departmental Category: Labor and Human Resources

ECON 3784 (3) Economic Development and Policy

Introductory course in Economic Development, designed for non-majors. Students are introduced to the major issues in development economics. Explores empirical, theoretical and policy issues in economic development. Emphasis is placed on the controversial issues in this literature, requiring students to explore competing, and often conflicting, perspectives of these issues.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Departmental Category: Economic Development

ECON 3818 (4) Introduction to Statistics with Computer Applications

Introduces statistical methods and their applications in quantitative economic analysis.

Requisites: Requires prerequisite courses of ECON 2010 and 2020 and either ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all minimum grade C-). Restricted to students with 22-180 units completed.

Additional Information: Departmental Category: Quantitative Economics

ECON 4050 (3) Market Design

Develops foundations for the modern market design practices. Economists are increasingly involved in studying and designing practical market mechanisms. Includes topics such as designing efficient matching markets (students to schools, doctors to hospitals), designing auction mechanisms (Google, Facebook, government) and designing market platforms (eBay, Amazon).

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 4060 (3) Choice Theory and Economic Ethics: Good, Bad and Happiness

Critiques how economists model and judge behavior. How we judge is contrasted with other moral philosophies. Economists assume individuals behave in their own best interests. What does this mean and is it true? Looks at research from psychology and neuroscience. Quizzes and a multi-step research paper, designed for students who love to question, research, write and rewrite.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

Recommended: Prerequisite ECON 3080.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 4070 (3) Topics in Microeconomics

Studies utility maximization under uncertainty, risk, game theory, moral hazard, and adverse selection. Applications include insurance markets and the theory of contracts.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 4111 (3) Money and Banking Systems

Discusses money, financial institutions and the monetary-financial system in a modern economy.

Requisites: Requires prerequisite course of ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Money and Banking

ECON 4211 (3) Public Economics: the Economics of the Government Sector

Focuses on taxation and public expenditures. Topics include economic rationale for government action, economic theory of government behavior, and effects of government policies on allocation of resources and distribution of income.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Public Economics

ECON 4221 (3) Political and Public Choice Economics

Explores decision-making in non-traditional market settings, specifically political market settings, using economic models. We investigate policy outcomes as the product of interactions among individuals in political markets, and analyze how governmental decisions are the result of rational optimizing behavior, even if they do not lead to policies that maximize national welfare.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Public Economics

ECON 4231 (3) Applied Economic Analysis and Public Policy

Applies economic analysis to current issues of public policy. Reviews basic public finance and economic justifications for government action. Examines structure and procedures of Colorado State Legislature. Chooses current legislative issues, reviews relevant economic literature and applies implications through briefing papers and testimony at legislative hearings. Explores the challenges of integrating informed economic analysis into legislative process.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Public Economics

ECON 4242 (3) Urban Economics: The Economics of Cities

Considers the economic forces which drive households and jobs to congregate in metropolitan areas. It then considers the forces within the city which determine how the established cities "look" - how rents vary with location, the distribution of jobs and households within a city, urban sprawl, and the sorting of households between neighborhoods. Finally it considers some government policies relating to land use and housing.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Urban and Regional Economics

ECON 4292 (3) Migration, Immigrant Adaptation, and Development

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4292 and GEOG 5292

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Urban and Regional Economics

ECON 4309 (3) Economics Honors Seminar 1

For information consult the department's director of honors. Open only to qualified seniors.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course
Departmental Category: Independent Study and Other Courses

ECON 4339 (3) Economics Honors Seminar 2

For information consult the department's director of honors. This course does not count toward major requirements.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 4413 (3) International Trade

Focuses on theories of international trade and its impacts on economic welfare. Analyzes commercial policy, including tariffs, non-tariff barriers, retaliation, regional integration, and factor migration.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: International Trade and Finance

ECON 4423 (3) International Finance

Covers balance of payments; foreign exchange market, income, trade, and capital flows; asset markets adjustment mechanisms; stabilization policies in an open economy; and problems of international monetary systems.

Requisites: Requires prerequisite course of ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: International Trade and Finance

ECON 4504 (3) The New Institutional Economics: Institutions, Contracts and Economic Outcomes

Understand the conceptual tool kit of the New Institutional Economics. The concepts include transaction costs, property rights, credible commitment, and most importantly the roles of formal and informal institutions. We will examine the impact of institutions on contracting and organizations. The goal is to understand how the underlying institutions determine the degree to which societies improve their economic performance.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080, and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Economic History

ECON 4514 (3) Economic History of Europe

Covers evolution of modern economic growth and development in Europe, emphasizing institutional change.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Economic History

ECON 4524 (3) Economic History of the United States

Evolution of modern economic growth and development in the U.S. from colonial times to the present emphasizing institutional change.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-).

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Economic History

ECON 4534 (3) Chinese Economic History in Comparative Perspective

Surveys the economic history of China in a comparative perspective, to understand the history of economic development in China in terms of existing economic theories of growth. The approximate timeline is from the 18th century to the 20th century.

Recommended: Prerequisite ECON 3070.

Additional Information: Departmental Category: Economic History
Departmental Category: Asia Content

ECON 4535 (3) Natural Resource Economics

Analysis of problems associated with socially optimal use of renewable and nonrenewable natural resources over time. Problems of common property resources, irreversible forms of development, and preservation of natural areas.

Equivalent - Duplicate Degree Credit Not Granted: ECON 3535

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 4545 (3) Environmental Economics

Examines the effects of economic growth on the environment; application of economic theory of external diseconomies, cost-benefit analysis, program budgeting, and welfare economics to problems of the physical environment.

Equivalent - Duplicate Degree Credit Not Granted: ECON 3545

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 4555 (3) Transportation Economics and Policy

Provides an overview of the characteristics and structure of transportation markets including aggregate demand, vehicle and mode choice, surface freight and air travel. Explores market failures in the transportation sector including market power and externalities such as pollution, congestion and accidents as well as policies aimed at addressing these issues.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 4616 (3) Labor Economics

Examines the influence of markets, unions, and government on labor allocation and remuneration. Analyzes human capital, discrimination, mobility and migration, productivity, unemployment, and inflation. Compares outcomes under competition with those in a world marked by shared market power and bargaining.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Labor and Human Resources

ECON 4626 (3) The Economics of Inequality and Discrimination

Examines the unique insights available through economic analysis regarding the causes, mechanisms, and consequences of inequality and discrimination. Examines the extent of inequality, the varieties and extents of discrimination, and explores the economic models that suggest explanations.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Labor and Human Resources

ECON 4646 (3) Topics in Health Economics

Growth in health expenditures worldwide over the past three decades has led to an increase in research in health economics and its importance in public policy in developed and developing countries. The purpose of this course is to encourage students to read, think, and do research on issues in health economics. This course will cover issues that are pertinent to the US, other developed and developing countries. It will cover the basics of health economics such as health production functions and the role for government as well as touching on topical issues such as health care reform.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Recommended: Prerequisite ECON 3818.

Additional Information: Departmental Category: Labor and Human Resources

ECON 4697 (3) Industrial Organization and Regulation

Explores neoclassical theory of the firm, the determinants of industrial structure, and the purposes and institutions of public policy to control or maintain a competitive environment.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4717 (3) Economics of Entrepreneurship

Introduces economic analysis of entrepreneurship, its financing, performance and public policy issues. We will investigate in depth the business of venture capital and start-ups. Aims to understand both academic and practical implications from the burgeoning literature on economics of entrepreneurship and private equity.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4774 (3) Economic Reform in Developing Countries

Explores competing paradigms of economic development, emphasizing the confrontation between the structuralist/dirigiste paradigm and the neoclassical public choice paradigm. Analyzes economic reforms under way in developing countries, including stabilization policy and structural adjustment. Also explores political reforms, including the pluralist revolution and the design of a constitutional framework in developing societies.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Economic Development
Departmental Category: Asia Content

ECON 4784 (3) Economic Development

Explores empirical, theoretical, and policy issues in economic development. Examines topics with reference to the developing countries: income distribution and poverty, demographic change, labor force employment and migration, human capital, physical capital, natural resources and the environment, industrial structure, international trade, and finance.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Economic Development
Departmental Category: Asia Content

ECON 4794 (3) Economic Growth

Introduces theories explaining why differences in standards of living among countries are so large. Examines a variety of data on historical experiences of economic growth. Surveys recent research on why some countries are so rich and some are so poor, and why some countries grow so quickly and others grow so slowly.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Economic Development

ECON 4797 (3) Antitrust and Regulation

Explores two major branches of Industrial Organization—antitrust and regulation. Focus is on developing qualitative and quantitative skills for the legal-economic analysis of issues and problems across a variety of industries. Case studies are used to illustrate concepts, including mergers, collusive agreements, monopolization, and networks. Individual and group projects help develop advocacy and public speaking skills.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4808 (3) Introduction to Mathematical Economics

Introduces the use of mathematics in economics. Topics include vectors and matrices, differential calculus, and optimization theory, with economic applications.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4818 (3) Introduction to Econometrics

Provides undergraduate economics majors with an introduction to econometric theory and practice. Develops the multiple regression model and problems encountered in its application in lecture and individual applied projects.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4838 (3) Microcomputer Applications in Economics

Teaches basic concepts in Java programming applied to economic models. Development of Web pages and dynamic modeling will be introduced. Students will gain a foundation that can be applied to creating advanced applications relating to analysis of statistical data and custom projects.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4848 (3) Applied Econometrics

Introduces students to the practice of applied regression analysis. Summarizes and reviews the regression technique, explores U.S. census data sources, introduces an advanced statistical software package and provides structured exercises in regression analysis of census data. Concludes with independent research projects analyzing social and economic issues using regression analysis and census data.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4858 (3) Financial Econometrics

Introduces statistical models, estimation and testing procedures used in analyzing financial data for advanced undergraduates. Topics include the modeling of returns, portfolio theory, the capital asset pricing model, options pricing and fixed income securities.

Requisites: Requires prerequisite course of ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (minimum grade C-).

Recommended: Prerequisite ECON 4818.

Additional Information: Departmental Category: Quantitative Economics

ECON 4868 (3) Simulation Modeling in Microeconomics

Computer simulation modeling translates theory into computer code to examine questions numerically; for example, the effects of taxes or emissions permits on welfare and income distribution. We use GAMS (general algebraic modeling system); a version may be downloaded for free. Students must have access to a computer (not needed in the classroom).

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4897 (3) Economics of Organizations

Introduces students to the economic analysis of relationship between firms and incentives within firms. The first part covers classical theories of firm boundaries and contractual relationship between firms. The second part focuses on compensation and incentive issues within firms.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4909 (3-4) Independent Study

Department enforced prerequisites: completion of at least 12 hours of ECON classes and a minimum GPA of 3.00. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 2020 and ECON 3070 or ECON 3080 (all minimum grade C-).

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 4929 (3) Special Topics In Economics

This course number is assigned to upper-level Economics electives that become available on an incidental basis. Refer to the Economics Department for a detailed description of current content. Formerly ECON 4999.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Independent Study and Other Courses
Departmental Category: Asia Content

ECON 4939 (2-6) Internship/Seminar

Offers students the opportunity to integrate theoretical concepts of economics with practical experience in economics-related institutions. The theoretical portion arises from seminars and readings, the practical from activities in organizations related to the economics field. A maximum of 3 credit hours counts toward major requirements. Department consent required.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Economic (ECON) majors or minors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Independent Study and Other Courses

Economics - Bachelor of Arts (BA)

The Department of Economics at University of Colorado at Boulder is recognized as a very high quality research and teaching department.

Economics is a quantitative, policy oriented social science with a highly developed body of theory and a wide range of real-world applications. Economists seek to describe the process by which societies use scarce resources to attain societal goals and predict the consequences of changes in those processes. Theoretical models, understanding of economic and policy making institutions, quantitative analysis, and the examination of data are all part of this field of knowledge.

In general, economists are interested in the economic behavior of individuals. Investigations of the daily decisions that consumers, workers, and firm managers make, as well as the interactions of such economic decisions in markets, is the subject of microeconomics.

Macroeconomics refers to the analysis of economic activity of individuals aggregated over many markets. Some of the specific issues of macroeconomics include economic growth, inflation, recession, and unemployment. Finally, international economics investigates the interrelationships among different economies, and in particular studies the pattern of trade and payments between countries.

Faculty fields of specialization include international trade/finance, natural resource and environmental economics, public economics, urban and regional economics, development economics, labor economics and demography, political economics, economic history, industrial organization/game theory, and econometrics.

Special Emphasis Options

The Economics Department offers four tracks for students who have a relatively high GPA and want to focus their upper-division course work in a specific area of interest. Interested students must have completed at least 6 credit hours of economics course work at CU in order to declare the special emphasis. Students must have completed two out of three intermediate-level courses (ECON 3070, ECON 3080 and/or ECON 3818)

with a minimum of 3.00 GPA in these courses, and must also have a minimum of 3.00 GPA in economics course work at CU by the time of declaration and completion of the special emphasis. Requirements are listed on the economics website at www.colorado.edu/economics (<http://www.colorado.edu/economics>).

Environmental and Natural Resources Emphasis

The environmental and natural resources emphasis is designed for economics majors who are considering careers in fields requiring a thorough understanding of a broad range of issues associated with business practices and public policies addressing natural resource use and environmental quality, including environmental regulation and compliance: energy production and consumption, development of energy transportation, urban, rural and regional infrastructures.

International Emphasis

The international emphasis is designed for students who have an interest in courses with an international perspective both within economics and outside the department. Courses in international trade and finance are combined with selections of international courses in related social science disciplines. This program may be of particular interest to students seeking careers in international business, international organizations, nongovernmental organizations and government agencies.

Public Economics Emphasis

The public economics emphasis is designed for students who have an interest in taking courses with a public policy perspective both within economics and outside the department. Courses in public economics are combined with selections of public policy oriented courses from various social sciences. This emphasis is recommended for students with interests in public policy seeking careers in local, state, national or international agencies.

Quantitative Emphasis

The quantitative emphasis is designed for well-qualified majors with an interest in theoretical and/or applied mathematics. Economics courses in quantitative methods are combined with courses from the Department of Mathematics and the Department of Applied Mathematics. This program may be of interest to students planning to pursue graduate studies in economics or those seeking a career in applied quantitative research.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below with total credit hours required for the major of 37–39.

Required Courses and Credit Hours

Economics Requirements

ECON 2010 & ECON 2020	Principles of Microeconomics and Principles of Macroeconomics	8
ECON 3070 & ECON 3080	Intermediate Microeconomic Theory and Intermediate Macroeconomic Theory	7
ECON 3818	Introduction to Statistics with Computer Applications	4
Select one of the following Econometrics:		3
ECON 4818	Introduction to Econometrics	
ECON 4848	Applied Econometrics	
ECON 4858	Financial Econometrics	
Electives in 4000-level ECON courses		12

Acillary Mathematics Requirement

Complete one of the following calculus courses: 3-5

APPM 1350	Calculus 1 for Engineers
ECON 1088	Mathematical Tools for Economists 2
MATH 1300	Calculus 1
MATH 1330	Calculus for Economics and the Social Sciences

Total Credit Hours 37-39

Note: Transfer students majoring in economics must complete at least 12 credit hours of upper-division economics courses at CU Boulder.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in economics, students should to the extent feasible and in consultation with their economics advisor, follow the "plan of study grid" and declare economics as a major by the beginning of the second semester.

Course	Title	Credit Hours
First Year		
Fall Semester		
ECON 2010	Principles of Microeconomics	4
Mathematics Requirement for Economics (3-5): Per ALEKS/AP results		3-5
CORE (3)		
CORE (3)		
Elective or MAPS (3): If needed		
		Credit Hours 7-9
Spring Semester		
ECON 2020	Principles of Macroeconomics	4
Mathematics Requirement for Economics (3-5): If needed		
CORE (3): Content area of study		
CORE (3): Content area of study		
Elective or MAPS (3): If needed		
		Credit Hours 4
Second Year		
Fall Semester		
ECON 3070	Intermediate Microeconomic Theory	4
ECON 3818	Introduction to Statistics with Computer Applications	4
CORE (3): Natural Science		
Elective (3)		
		Credit Hours 8
Spring Semester		
ECON 3080	Intermediate Macroeconomic Theory	3
CORE (3): Natural Science		
CORE (3): Content area of study		

Elective (3)		
Elective (3)		
		Credit Hours 3
Third Year		
Fall Semester		
ECON 4818 or ECON 4848 or ECON 4858	Introduction to Econometric or Applied Econometrics or Financial Econometrics	3
ECON (3): 4000-level elective		3
CORE (3): Skills acquisition		
CORE (4): Natural Science with lab		
Elective (3): Upper-division		
		Credit Hours 6
Spring Semester		
ECON (3): 4000-level elective		3
CORE (3): Natural Science		
CORE (3): Content area of study		
Elective (3): Upper-division		
Elective (3)		
		Credit Hours 3
Fourth Year		
Fall Semester		
ECON (3): 4000-level elective		3
CORE (3): Content area of study		
Elective (3): Upper-division		
Elective (3)		
Elective (3)		
		Credit Hours 3
Spring Semester		
ECON (3): 4000-level elective		3
Elective (3): Upper-division		
Elective (3)		
Elective (3)		
		Credit Hours 3
		Credit Hours 3
		Total Credit Hours 37-39

Economics - Minor

The Department of Economics at University of Colorado Boulder is recognized as a very high quality research and teaching department.

Economics is a quantitative, policy oriented social science with a highly developed body of theory and a wide range of real-world applications. Economists seek to describe the process by which societies use scarce resources to attain societal goals and predict the consequences of changes in those processes. Theoretical models, understanding of economic and policy making institutions, quantitative analysis, and the examination of data are all part of this field of knowledge.

In general, economists are interested in the economic behavior of individuals. Investigations of the daily decisions that consumers, workers, and firm managers make, as well as the interactions of

such economic decisions in markets, constitute the subject of microeconomics. Macroeconomics refers to the analysis of economic activity of individuals aggregated over many markets. Some of the specific issues of macroeconomics include economic growth, inflation, recession, and unemployment. Finally, international economics investigates the interrelationships among different economies and, in particular, studies the pattern of trade and payments between countries.

Faculty fields of specialization include international trade/finance, natural resource and environmental economics, public economics, urban and regional economics, development economics, labor economics and demography, political economics, economic history, industrial organization/game theory, and econometrics.

A minor is offered in economics. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students pursuing an individually structured major or who are pursuing a major in distributed studies will not be eligible to earn a minor in economics.

Required Courses and Semester Credit Hours

Completion of the minor requires a total of 20 credit hours in economics.

Required Courses

ECON 2010 & ECON 2020	Principles of Microeconomics and Principles of Macroeconomics	8
ECON 3070 & ECON 3080	Intermediate Microeconomic Theory and Intermediate Macroeconomic Theory	7

Electives

Electives in upper-division ECON courses		6
Total Credit Hours		21

NOTE: Students must complete at least one 4000-level course as an upper-division elective. ECON 3818 and equivalent substitutes are **not** allowed to count as an upper-division elective.

All course work applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA for all minor degree course work must equal 2.00 or higher.

Students will be allowed to apply no more than 9 credit hours, including 6 upper-division credit hours, of transfer work toward a minor. If transferred course work includes replacements for ECON 2010 or ECON 2020 that are fewer than a combined 7 credit hours for both courses, an additional upper-division elective will be added to the requirements for a minor.

Students may elect to take the 3000-level ECON courses that are designed for non-economics majors (e.g., ECON 3403, ECON 3535, ECON 3545, ECON 3616, and ECON 3784).

ECON 3070, ECON 3080 and all 4000-level ECON courses require a prerequisite of Calculus. Students may take the following courses to meet this prerequisite: ECON 1088; or MATH 1081; or MATH 1300; or APPM 1350.

English

The undergraduate degree in English emphasizes knowledge and awareness of:

- canonical and non-canonical works of English and American literature
- the history of British and American literature

- literary theories, including recent theoretical developments
- the social and historical contexts in which the traditions developed

In addition, students completing the degree in English are expected to acquire the ability and skills to:

- analyze literary texts;
- interpret texts on the basis of such analysis;
- relate analyses and interpretations of different texts to one another; and
- communicate such interpretations competently in written form.

The undergraduate degree in creative writing emphasizes knowledge and awareness of:

- literary works, including the genres of fiction, poetry, playwriting and screenwriting, and the major texts of contemporary writers
- literary history, including the origins and development of genres, major writers of the past and the role of the writer in society
- literary analysis, including theories of literary composition and critical theory

In addition, students completing the degree in creative writing are expected to acquire the ability and skills to:

- write in various poetic modes and styles
- write in various fictive styles
- write in various nonfiction styles
- evaluate other students' written work

Course code for this program is ENGL.

Advising

Upon declaring an English major, students are assigned an English advisor. The advisors are available to meet with students by appointment and on a drop-in basis. The advisors monitor and evaluate student progress in completing the arts and sciences core curriculum and major requirements, and certify students for graduation. The department encourages students to meet with their primary advisor at least once each semester to update their student file and ensure that they are making satisfactory progress in meeting the core and major requirements.

Departmental Honors

Students interested in pursuing a special program leading to graduation with departmental honors should confer with the associate chair for undergraduate studies as soon as possible, but definitely no later than the beginning of spring term in their junior year. For additional information on departmental honors, visit <http://www.colorado.edu/english/undergraduates>.

Students Who Contemplate Teaching

Sheets listing the curriculum required for a teaching license for secondary schools may be obtained in Education 151. Since fulfilling requirements for both education and English makes a very tight schedule, students should seek early advising to complete their college requirements. For additional information, visit teaching licensure (p. 575).

Undergraduate English Awards and Prizes

The Alex McGuiggan Scholarship

The Alex McGuiggan Scholarship was established in spring 2010 to recognize the achievement of an undergraduate English major studying creative writing with a preference for students whose strength is in writing poetry. The scholarship was established in memory of Alex McGuiggan, an English major at the University of Colorado Boulder.

The Curtis Michael Gimeno Memorial Scholarship

This scholarship benefits students with a creative writing emphasis who exemplify promise of talent in communicating through the written language. The scholarship was generously established by Donna Jorgenson Farrell in memory of and as a legacy to her son, Curtis Michael Gimeno, who enjoyed writing.

The Dick Shahan CU Boulder Undergraduate Writing Competition

Created by English alumnus Dick Shahan, this scholarship is open to all CU Boulder undergraduate students. Students can use their imaginations and demonstrate their writing skills in different genres while celebrating Boulder.

The Gentian Ascension Scholarship

This scholarship is a variable annual award established to benefit an undergraduate student who exhibits a past that demonstrates overcoming academic obstacles and shows budding talent as a writer.

The Harold D. Kelling Essay Prize

The Kelling prize is a variable cash award for the best essay on literature submitted by an undergraduate currently enrolled in the university. The essay must have been written for an English class at CU Boulder.

The Joanne Easley Arnold Award

The Joanne Easley Arnold English Scholars Fund is a two-year award designed to recognize and provide financial and intellectual support to a top English major in honor of the donor, Joanne Easley Arnold, who was a dean with the university.

The Jovanovich Imaginative Writing Prize

The Jovanovich prize is an annual award for excellence in poetry, fiction, playwriting or nonfiction prose.

The Katherine Lamont Scholarship

The Lamont scholarship is a variable annual award to a continuing English major in recognition of sustained excellence and exceptional scholarly performance in the major.

Bachelor's Degree

- English - Bachelor of Arts (BA) (p. 283)

Minors

- Creative Writing - Minor (p. 283)
- English - Minor (p. 283)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baker, Donald C.
Professor Emeritus

Bassoff, Bruce
Professor Emeritus

Beechy, Tiffany R. (https://experts.colorado.edu/display/fisid_149775)
Assistant Professor; PhD, University of Oregon

Bell, Michael
Professor Emeritus

Bickman, Martin (https://experts.colorado.edu/display/fisid_100230)
Professor; PhD, University of Pennsylvania

Billingsley, Ronald
Professor Emeritus

Boardman, Arthur M.
Professor Emeritus

Bradley, Adam Francis (https://experts.colorado.edu/display/fisid_147509)
Associate Professor; PhD, Harvard University

Brylowe, Thora (https://experts.colorado.edu/display/fisid_156063)
Assistant Professor; PhD, Carnegie Mellon University

Burger, Douglas A.
Professor Emeritus

Carr, Julia Alice (https://experts.colorado.edu/display/fisid_143349)
Associate Professor; PhD, University of California-Berkeley

Cox, Jeffrey N (https://experts.colorado.edu/display/fisid_113253)
Professor; PhD, University of Virginia

Deagman, Rachael Nicole (https://experts.colorado.edu/display/fisid_154125)
Instructor; PhD, Duke University

Deshell, Jeffrey (https://experts.colorado.edu/display/fisid_118482)
Professor; PhD, SUNY at Buffalo

Douglas, Marcia B (https://experts.colorado.edu/display/fisid_122696)
Associate Professor; PhD, SUNY at Binghamton

Eggert, Katherine (https://experts.colorado.edu/display/fisid_103618)
Professor; PhD, University of California-Berkeley

Emerson, Lori Ann (https://experts.colorado.edu/display/fisid_145834)
Associate Professor; PhD, SUNY at Buffalo

Garrity, Jane Marie (https://experts.colorado.edu/display/fisid_105467)
Associate Professor; PhD, University of California-Berkeley

Gladstone, Jason Daniel (https://experts.colorado.edu/display/fisid_154914)
Instructor

Glimp, David R. (https://experts.colorado.edu/display/fisid_143616)
Associate Professor; PhD, Johns Hopkins University

Goldfarb, Sidney
Professor Emeritus

Goodman, Nan (https://experts.colorado.edu/display/fisid_100633)
Professor; PhD, Harvard University

Gordon, Noah Eli (https://experts.colorado.edu/display/fisid_147334)
Assistant Professor; MFA, University of Massachusetts at Amherst

Green, Jeremy F (https://experts.colorado.edu/display/fisid_113077)
Associate Professor; PhD, University of Cambridge (England)

Harrington, Emily Marie (https://experts.colorado.edu/display/fisid_154601)
Associate Professor; PhD, University of Michigan Ann Arbor

Hasan, Raza Ali (https://experts.colorado.edu/display/fisid_146167)
Instructor; MFA, Syracuse University

Heydt-Stevenson, Jillian (https://experts.colorado.edu/display/fisid_111683)
Associate Professor; PhD, University of Colorado Boulder

Higashida, Cheryl A (https://experts.colorado.edu/display/fisid_126280)
Associate Professor; PhD, Cornell University

Ho, Janice Chiew Ling (https://experts.colorado.edu/display/fisid_145805)
Associate Professor; PhD, Cornell University

Hogan, Linda
Professor Emeritus

Hurley, Kelly K (https://experts.colorado.edu/display/fisid_105553)
Associate Professor; PhD, Stanford University

Jacobs, Karen S (https://experts.colorado.edu/display/fisid_100280)
Associate Professor; PhD, University of California-Berkeley

Jones, Stephen Graham (https://experts.colorado.edu/display/fisid_146498)
Professor; PhD, Florida State University

Juhasz, Suzanne H.
Professor Emeritus

Katz, Steven
Professor Emeritus

Kawin, Bruce F.
Professor Emeritus

Kelsey, Penelope M. (https://experts.colorado.edu/display/fisid_147607)
Professor; PhD, University of Minnesota Twin Cities

Kinneavy, Gerald B.
Professor Emeritus

Klages, Mary K (https://experts.colorado.edu/display/fisid_101897)
Associate Professor; PhD, Stanford University

Kocher, Ruth Ellen (https://experts.colorado.edu/display/fisid_143618)
Professor; PhD, Arizona State University

Krauth, Philip L.
Professor Emeritus

Krysl, Marilyn D.
Professor Emeritus

Kuskin, William (https://experts.colorado.edu/display/fisid_143742)
Professor; PhD, University of Wisconsin-Madison

Labio, Catherine (https://experts.colorado.edu/display/fisid_147608)
Associate Professor; PhD, New York University

Lagman, Eileen Anne (https://experts.colorado.edu/display/fisid_156308)
Assistant Professor; MA, DePaul University

Lamos, Steven Joseph (https://experts.colorado.edu/display/fisid_141169)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Levitt, Paul M.
Professor Emeritus

Little, Katherine C. (https://experts.colorado.edu/display/fisid_149872)
Professor; PhD, Duke University

Lyons, Thomas
Professor Emeritus

Mattar, Karim (https://experts.colorado.edu/display/fisid_153056)
Assistant Professor; DPhil, Oxford Univ (England)

Michelson, Peter F.
Professor Emeritus

Moskovit, Leonard
Professor Emeritus

Muller-Sievers, Helmut Heinz (https://experts.colorado.edu/display/fisid_147511)
Professor; PhD, Stanford University

Munkhoff, Richelle (https://experts.colorado.edu/display/fisid_143801)
Assistant Professor; PhD, University of Wisconsin-Madison

Nugent, Teresa L (https://experts.colorado.edu/display/fisid_101477)
Instructor; PhD, University of Colorado Boulder

Preston, Michael J.
Professor Emeritus

Proudfit, Charles L.
Professor Emeritus

Rivera, John-Michael (https://experts.colorado.edu/display/fisid_118393)
Associate Professor; PhD, University of Texas at Austin

Rivers, Julius Edwin (https://experts.colorado.edu/display/fisid_101652)
Professor; PhD, University of Oregon

Robertson, Benjamin John (https://experts.colorado.edu/display/fisid_146500)
Instructor; PhD, SUNY at Buffalo

Robinson, Jeffrey C.
Professor Emeritus

Saner, Reginald A.
Professor Emeritus

Sawin, Lewis
Professor Emeritus

Sheffield, Elisabeth Ann (https://experts.colorado.edu/display/fisid_123500)
Associate Professor; PhD, SUNY at Buffalo

Stein, Lara C (https://experts.colorado.edu/display/fisid_156437)

Stevenson, John A (https://experts.colorado.edu/display/fisid_101656)
Professor; PhD, University of Virginia

Sullivan, Patricia A (https://experts.colorado.edu/display/fisid_126640)
Professor; PhD, Ohio State University

Toulouse, Teresa A (https://experts.colorado.edu/display/fisid_143728)
Professor; PhD, Harvard University

White, Eric C (https://experts.colorado.edu/display/fisid_101917)
Associate Professor; PhD, University of California-Berkeley

Windell, Maria A. (https://experts.colorado.edu/display/fisid_154605)
Assistant Professor; PhD, University of Virginia

Winkiel, Laura Ann (https://experts.colorado.edu/display/fisid_145813)
Associate Professor; PhD, University of Notre Dame

Winokur, Mark (https://experts.colorado.edu/display/fisid_115732)
Associate Professor; PhD, University of California-Berkeley

Wrenn, John H.
Professor Emeritus

Wright, Constance
Professor Emeritus

Wright, Nicole M (https://experts.colorado.edu/display/fisid_153060)
Assistant Professor; PhD, Yale University

Youngquist, Paul Bruce (https://experts.colorado.edu/display/fisid_147514)
Professor; PhD, University of Virginia

Zemka, Sue (https://experts.colorado.edu/display/fisid_103078)
Professor; PhD, Stanford University

ENGL 1001 (3) Freshman Writing Seminar

Provides training and practice in writing and critical thinking. Focuses on the writing process, the fundamentals of composition, and the structure of argument. Provides numerous and varied assignments with opportunity for revision.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Arts and Sciences majors only.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Undergraduate Writing
MAPS Course: English

ENGL 1191 (3) Introduction to Creative Writing

Introduces techniques of fiction and poetry. Student work is scrutinized by the instructor and may be discussed in a workshop atmosphere with other students. May not be taken concurrently with ENGL 2021 or ENGL 2051. May not be repeated. Not open to graduate students.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 1210 (3) The Novel

Explores the many possibilities of the novel, or, the novel as possibility, and emphasize that formal and aesthetic innovation is not peripheral to the novel's development but central to its influence and existence. Focuses on the elements of fiction in order to develop an aesthetic and literary appreciation of this complex art form.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Literature and Language

ENGL 1220 (3) From Gothic to Horror

Explores literature in the Gothic mode and aesthetic and critical theories related to modern "horror" genres or their precursors. Introduces literary-critical concepts (such as notions of abjection, repression and anxiety) that developed alongside this branch of literature. Students read canonical works in British and American traditions while reflecting on notions of popular or marginalized literature.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1230 (3) Environmental Literature

Introduces students to the tradition of nature writing dating from Romanticism through realist and experimental contemporary literary texts. Students will study key terms and concepts related to the environment such as anthropocentrism, bioregionalism, eco-cosmopolitanism, environmental justice, deep ecology, and posthumanism. They will apply them to different literary genres toward developing critical analyses and environmental readings.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1260 (3) Introduction to Women's Literature

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

Equivalent - Duplicate Degree Credit Not Granted: WGST 1260

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General Literature and Language

ENGL 1340 (3) Mysticism and the Jewish American Literary Tradition

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1234

Grading Basis: Letter Grade

Additional Information: Departmental Category: American Literature

ENGL 1420 (3) Poetry

Introduces students to how to read a poem by examining the great variety of poems written and composed in English from the very beginning of the English language until recently.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1500 (3) Masterpieces of British Literature

Introduces students to a range of major works of British literature, including at least one play by Shakespeare, a pre-20th century English novel, and works by Chaucer and/or Milton.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1600 (3) Masterpieces of American Literature

Enhances student understanding of the American literary and artistic heritage through an intensive study of a few centrally significant texts, emphasizing works written before the 20th century.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1800 (3) American Ethnic Literatures

Introduces significant fiction by ethnic Americans. Explores both the literary and the cultural elements that distinguish work by these writers. Emphasizes materials from Native American, African American, and Chicano traditions.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General Literature and Language

ENGL 2021 (3) Introductory Poetry Workshop

Introductory course in poetry writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 1191 (minimum grade B). Not open to graduate students.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 2036 (3) Introduction to Media Studies in the Humanities

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant reading and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 2036

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 2051 (3) Introductory Fiction Workshop

Introductory course in fiction writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 1191 (minimum grade B).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 2058 (3) Twentieth- and Twentyfirst-Century Literature

Surveys the major literary trends in prose and poetry from 1900 to the present in the Anglo-American tradition of modern, postmodern, and contemporary literature. Provides students with a grounding in the major authors and motifs of 20th- and 21st-century in literature in conjunction with political and cultural changes across the periods.

Additional Information: Departmental Category: Critical Studies in English

ENGL 2102 (3) Literary Analysis

Provides a basic skills course designed to equip students to handle the English major. Emphasizes critical writing and the acquisition of basic techniques and vocabulary of literary criticism through close attention to poetry and prose.

Requisites: Restricted to English (ENGL) majors and minors only.

Additional Information: Departmental Category: General Literature and Language

ENGL 2112 (3) Introduction to Literary Theory

Introduces students to a wide range of critical theories that English majors need to know. Covers major movements in modern literary/critical theory, from Matthew Arnold through new criticism to contemporary postmodern frameworks. Required for all English majors.

Requisites: Restricted to English (ENGL) majors and minors only.

Additional Information: Departmental Category: General Literature and Language

ENGL 2115 (3) American Frontiers

Considers the backdrop of the American West in literature, film, photography and computer gaming. Focuses on a range of narratives and images depicting this wide swathe of American geography while simultaneously cultivating close reading skills, digital media analysis and film analysis that will aid in deeper insights at the textual level.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Literature

ENGL 2503 (3) British Literary History to 1660

Provides a chronological study of great figures and forces in English literature from Beowulf to 1660.

Additional Information: Departmental Category: British Literature to 1660

ENGL 2504 (3) British Literary History after 1660

Provides a chronological study of great figures and forces in English literature from 1660 to the present. Formerly ENGL 2512.

Additional Information: Departmental Category: British Literature after 1660

ENGL 2655 (3) Introduction to American Literature I

Chronological survey of the literature from Bradford to Whitman.

Additional Information: Departmental Category: American Literature

ENGL 2665 (3) Introduction to American Literature 2

Chronological survey of the literature from Whitman to Faulkner. Continuation of ENGL 2655.

Additional Information: Departmental Category: American Literature

ENGL 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 2707

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2717 (3) American Indian Literature

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2713

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2727 (3) Survey of African American Literature 1

Surveys African American literature from the 17th century through the Harlem Renaissance and Depression.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2737 (3) Survey of African American Literature 2

Surveys African American literature from the Depression to the present.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2732

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2747 (3) Chicana/Chicano and Mexican Literature

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2746

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2767 (3) Survey of Post-Colonial Literature

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2761

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3000 (3) Shakespeare for Nonmajors

Introduction to Shakespeare. Introduces students to 6-10 of Shakespeare's major plays. Comedies, histories, and tragedies will be studied. Some non-dramatic poetry may be included. Viewing of Shakespeare in performance is often required.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only. English (ENGL) and Humanities (HUMN) majors are excluded from taking this class.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 3005 (3) The Literature of New World Encounters

Explores American literature as a site of cultural intersection between European settlers and indigenous peoples.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3008 (3) Developments in the Novel, Post-1900

Introduces students to the major works, authors and formal trends of the 20th and 21st-century novel. Texts may be drawn from British, American and global literary traditions. Focuses on a specific movement, development, or transformation in the genre post-1900, for instance, modernism, postmodernism, naturalism, realism, postcolonial fiction, historical fiction.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Critical Studies in English

ENGL 3011 (3) Literary Forms and Styles in Post-1900 Literature

Studies special topics in literary forms and styles (e.g. magical realism, naturalism, language poetry, etc.) and also the development of genres (e.g. poetry, drama, digital media, novel) in the 20th- and 21st-centuries. Topics vary each semester. Specially design for English majors. May be repeated for a total of 6 units for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3021 (3) Intermediate Poetry Workshop

Intermediate course in poetry writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 2021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3025 (3) American Nationalisms

Examines how literature participates in the creation of American national culture and identify. Surveys major political writing and a variety of literary genres, tropes, and themes from early native American tales to the 20th-century literature.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3041 (3) Studies in Fiction and Poetry

Examines literary forms and themes with special emphasis on issues related to the craft of poetry and fiction. This course is taught in conjunction with visiting lectures by practicing writers. Does not count as Creative Writing workshop credit.

Requisites: Requires prerequisite course of ENGL 1191 (minimum grade B).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3051 (3) Intermediate Fiction Workshop

Intermediate course in fiction writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course ENGL 2051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3060 (3) Modern and Contemporary Literature for Nonmajors

Close study of significant 20th-century poetry, drama, and prose works. Readings range from 1920s to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 3068 (3) Literature in English, 1900-1945

Surveys major literary trends from 1900-1945 in the Anglo-American tradition, including the characteristics of literary modernism. Covers both prose and poetry, as well as the relationship between literature and history to the close of World War II.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Critical Studies in English

ENGL 3078 (3) Literature in English, 1945-Present

Explores major literary and theoretical trends in the Anglo-American tradition after 1945.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Recommended: Prerequisites ENGL 2102 and ENGL 2058.

Additional Information: Departmental Category: Critical Studies in English

ENGL 3081 (3) Intermediate Nonfiction Workshop

Discussion and practical criticism of student work and discussion of relevant works of literary nonfiction.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 2021 or ENGL 2051 (minimum grade B). Restricted to English (ENGL), Humanities (HUMN), Theatre (THTR or TBFA) majors only or Creative Writing (CRW) minor students only.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3088 (3) Major Authors of Post-1900 Literature

Provides an in-depth study of the work of one or two major authors in the Anglo-American tradition after 1900. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Critical Studies in English

ENGL 3116 (3) Topics in Advanced Theory

Studies special topics in theory; specially designed for English majors. Topics vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 2112 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3164 (3) History and Literature of Georgian Britain

Provides an interdisciplinary study of England in one of its most vibrant cultural and historical periods. Topics include politics, religion, family life, and the ways contemporary authors understood their world.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: British Literature after 1660

ENGL 3204 (3) Developments in the Novel

Covers the development of the novel.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3217 (3) Topics in Gender Studies

Studies special topics in gender studies; specially designed for English majors. Topics vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3226 (3) Folklore

Emphasizes formal study of folk traditions (including tales, songs, games, customs, beliefs, and crafts) within a theoretical framework, using examples from several cultures.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3235 (3) American Novel

Surveys the American novel. Covers the early development of the American novel, its rise in the 19th- and 20th-centuries, and its contemporary expressions. Students will be introduced to theories of the novel, the major movements and authors, as well as the characteristics that define the American novel as unique.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3245 (3) American Poetry

Surveys American poetry from the 17th- to the 21st-century. Includes training in poetic theory, form, and genre, as well as in poetic analysis.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3246 (1-3) Topics in Popular Culture

Studies special topics in popular culture; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3267 (3) Women Writers

Introduces literature by British and American women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3267

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3300 (3) Literary London

Study the works of a major author, school or period of English literary history in London. Subject rotates each year, with possible topics ranging from medieval to contemporary literature. Course incorporates local sites, landmarks, museums, performances and scholars. Application through the Office of International Education required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 3310 (3) The Bible as Literature

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly ENGL 3312.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3310 and JWST 3310

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Backgrounds to Literature in English

ENGL 3377 (3) Multicultural Literature

Studies special topics in multicultural literature; specially designed for English majors. Topics vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3523 (3) The Renaissance in England, 1500-1600

Selected prose and non-dramatic poetry from Skelton and More through Shakespeare and his contemporaries. Formerly ENGL 4523.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3533 (3) The Renaissance in England, 1600-1700

Selected prose and poetry by Donne, Jonson, Bacon and their successors. Formerly ENGL 4533.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3544 (3) The Restoration and the Eighteenth Century

Surveys main currents in the literature and culture of the long 18th century. Formerly ENGL 4544.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3553 (3) Geoffrey Chaucer

Selection of Chaucer's works, including *The Canterbury Tales* and other shorter poems. Includes an introduction to Middle English.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3563 (3) Shakespeare

Shakespeare's poetry and drama.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3564 (3) Romanticism

Surveys British Romanticism, including Blake, Coleridge, Wordsworth, Keats, Shelley, and Byron.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3573 (3) Shakespeare in Performance

Focuses on Shakespeare the dramatist through the study of the three Shakespeare plays produced in the summer by the Colorado Shakespeare Festival. In addition to exploring the text, the historical context and performance conventions c. 1600, students meet the CSF teams (professional directors, dramaturgs, designers and actors) of the three plays and the Producing Artistic Director of the CSF.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3583 (3) Milton

Milton's poetry and selected prose.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3593 (3) Major Authors in British Literature before 1660

Focuses on one major author of the medieval or early modern period, such as William Langland, John Lydgate, Edmund Spenser or Ben Jonson. Course content varies with instructor and may include literary influences, contemporary writers, and historical influences as necessary to understanding the writer. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3604 (3) The Victorian Era

Surveys main currents of Victorian thought in prose and poetry.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3675 (3) Major Authors in American Literature

Provides an in-depth study of the work of one or two major American authors. Explores the range, influences, and development of a writer over his or her life.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3767 (3) Feminist Fictions

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality—and thereby the creative malleability—of gender itself. Some cinematic and performance texts will also be included.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3767

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3796 (3) Queer Theory

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 3796

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3856 (1-3) Topics in Genre Studies

Studies special topics in genre studies; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3930 (1-6) Internship

Provides academically supervised opportunity for upper-division students to work in public or private organizations on projects related to students' career goals and to relate classroom theory to practice. Department enforced prerequisite: 3.0 GPA and faculty supervision.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 3940 (1-3) Service Learning Practicum

Under faculty supervision, students participate in a service project in conjunction with an academic course.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General Literature and Language

ENGL 4003 (3) Introduction to Old English

Introduces students to Old English, the ancient ancestor of Modern English (as Latin is the ancestor of Spanish and Italian, distinct from both). Course will focus on reading knowledge through grammar study and translation, and to a lesser extent on pronunciation. Provides basic parsing and translation skills and an introduction to the history, culture, and literature of Anglo-Saxon England.

Additional Information: Departmental Category: British Literature to 1660

ENGL 4013 (3) Intermediate Old English

Continues development of skills in Old English reading and translation. Translation and literary study of one longer work and a number of shorter related works. Repeatable course rotates on a three-year basis, for instance, year one may focus on Beowulf and shorter heroic elegies; year two may involve prose such as legends and saints' lives; year three may involve religious poetry.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 4003 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: British Literature to 1660

ENGL 4018 (3) Global, Transnational and Postcolonial Approaches to Post-1600 Literature

Studies special topics that focus on transnational and global issues in the 20th- and 21st-century literature. For instance, the emergence of globalization, the impact of cross-cultural exchanges, the increase of migration, or the legacies of imperialism. Topics vary each semester. Specially designed for English majors. May be repeated for a total of 6 units for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4021 (3) Advanced Poetry Workshop

Advanced course in poetry writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course ENGL 3021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4026 (3) Special Topics in Genre, Media, and Advanced Writing

Studies theoretical and historical approaches to genre, media, and writing at the advanced level.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 4039 (3) Critical Thinking in English Studies

Concerned with developments in the study of literature that have significantly influenced our conception of the theoretical bases for study and expanded our understanding of appropriate subject matter.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of ENGL 2102 and ENGL 2112 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) English (ENGL) or Humanities (HUMN) majors only.

Additional Information: Departmental Category: Critical Studies in English

ENGL 4048 (3) Modern British and Irish Novel

Studies major figures and trends in the 20th century. Formerly ENGL 4224.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4051 (3) Advanced Fiction Workshop

Advanced course in fiction writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4071 (3) Screenwriting Workshop

Designed to give students practical criticism of their script writing and technical format requirements. Either stage plays or screenplays are studied, as announced.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4081 (3) Playwriting Workshop

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4098 (3) Special Topics in the Novel, Post-1900

Explores a special topic in literature written in, or translated into English, post-1900.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Critical Studies in English

ENGL 4113 (3) History and Culture of Medieval England

Explores the major historical, literary, and cultural developments in England from the Anglo-Saxon period through the 15th-century.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: British Literature to 1660

ENGL 4116 (3) Advanced Topics in Media Studies

Studies specialized topics in the history, theory, and practice of media, such as the history of the book, the theory of digital media, and the theory and practice of multimedia forms. Specially designed for English majors. Topics vary year to year.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 4250 (3) Modern and Contemporary Novel

Close study of masterpieces by such novelists as Proust, Joyce, Woolf, Lawrence, Mann, Kafka, and Faulkner.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 4277 (3) Topics in Women's Literature

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4277

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4286 (3) Folklore 2

Upper-division studies of folk groups, events, texts, and contexts as they reflect traditional knowing-folk perceptions and teachings about the structure and purpose of the universe.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 4287 and WGST 4287

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4360 (3) Modern Drama

Explores continental, British, and American drama since Ibsen.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 4460 (3) Modern Poetry

Selects works of British and American poets from 1900 to the present.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 4503 (3) Continental Medieval Literature

Intensive study of the major literary works of the Middle Ages in Europe.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4513 (3) British Medieval Literature

Intensive study of the major literary works of the Middle Ages in Britain.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4514 (3) Advanced Topics: The Restoration and the Eighteenth Century

Covers advanced topics in the Restoration and Eighteenth-century.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4524 (3) Advanced Topics: Romanticism

Covers advanced topics in British Romanticism. Formerly ENGL 4574.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4583 (3) Elizabeth I and Her Times

Interdisciplinary course explores different aspects of the reign of Elizabeth I: social and political history; literature; theater; music. Explores the role and impact of a female ruler on English culture.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4624 (3) Transnational/Historic/Interdiscipline Approaches 1660-1900

Explores a special topic in British literature written between 1660-1900 that crosses traditional divisions of nationality, history, and discipline.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4634 (3) Advanced Topics: The Victorian Era

Covers advanced topics in Victorian literature. Formerly ENGL 4614.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4655 (3) Studies in American Literature to 1900

Extensive study of particular periods and movements in American literature.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 4665 (3) Studies in American Literature after 1900

Extensive study of particular periods and movements in American literature.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 4677 (3) Jewish-American Literature

Explores the Jewish-American experience from the 19th-century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly ENGL 3677.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4677

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Multicultural and Gender Studies

ENGL 4685 (3) Special Topics in American Literature

Explores a special topic in American literature. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 4693 (3) Advanced Topics in British Literature to 1660

Explores a special topic in medieval or early modern literature. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4697 (3) Special Topics in Multicultural and Ethnic American Literature

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4692

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4717 (3) Native American and Indigenous Studies Capstone Seminar

Engages a wide range of NAIS methodologies with a series of case studies. Focuses on print, visual, and digital texts encompassing wide swathe of Eurowestern disciplines, while seeking to recuperate and restore Indigenous epistemic practices within our scholarship. Refines students' skills in intellectual debate in the spirit of shared inquiry and challenges research and writing skills.

Requisites: Requires prerequisite course of ETHN 1023 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4820 (3) Honors Seminar

Prepares prospective honors students to write honors theses. Focuses on sharpening the skills needed to write a successful thesis, including research techniques and the ability to evaluate and respond to secondary materials. Required for Honors in English Literature.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course
Departmental Category: General Literature and Language

ENGL 4830 (3) Honors Thesis

Students accepted to English Departmental Honors are enrolled in this course.

Additional Information: Arts Sciences Honors Course
Departmental Category: General Literature and Language

ENGL 4840 (1-3) Independent Study---Upper Division

Creative writing.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: General Literature and Language

ENGL 4850 (1-3) Independent Study---Upper Division

Literature/language.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: General Literature and Language

Creative Writing - Minor

Minor Program in Creative Writing

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students majoring in English, literature or creative writing track, cannot declare a creative writing minor. Students are subject to those minor requirements in effect at the time they formally declare the minor.

Completion of the minor requires 18 credit hours, at least 9 of which must be upper-division.

Required Courses and Credit Hours

Required Courses

ENGL 1191	Introduction to Creative Writing	3
ENGL 3041	Studies in Fiction and Poetry	3
Four creative writing workshops, taken in progressive order		12
Total Credit Hours		18

Students declare the creative writing minor with the help of an academic advisor. Three hours of transfer workshop credits can be applied with department approval. Students should ideally declare no later than the second semester of their junior year.

In order to take workshops beyond the 2000-level, students must declare the creative writing minor or the creative writing major track. Each workshop may be taken three times for credit, except for ENGL 1191. All students completing the creative writing track must take and complete a 4000-level writing workshop. Students may not take two poetry or two fiction writing workshops in the department in the same semester. Students must satisfy all prerequisites in sequence with a grade of B or better before moving on to the workshop at the next level.

English - Minor

Minor Program in English Literature

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students majoring in English, literature or creative writing track, cannot declare a literature minor. Students are subject to those minor requirements in effect at the time they formally declare the minor.

Completion of the minor requires 18 credit hours with grades of C- or better, at least 12 of which must be upper-division.

Required Courses and Credit Hours

Required Courses

ENGL 2102	Literary Analysis	3
One additional ENGL course at the 2000-level or above		3
Two ENGL courses at the 3000-level or above		6
Two ENGL courses at the 4000-level or above		6
Total Credit Hours		18

Students may not apply creative writing courses toward the literature minor, and this includes ENGL 3041 Studies in Fiction and Poetry. Students must maintain at least a 2.00 (C) GPA in all CU Boulder ENGL courses.

Students may apply no more than 9 credit hours of transfer work, including no more than 6 upper-division credit hours, towards a minor. This is a college residency rule for an 18-credit-hour minor.

English - Bachelor of Arts (BA)

The English department offers two undergraduate major concentrations culminating in the English Bachelor of Arts (BA). These programs overlap so that all English majors learn the skills of literary criticism and the art of excellent writing.

Honors Program

Students interested in pursuing a special program leading to graduation with departmental honors should confer with the associate chair for undergraduate studies as soon as possible, but definitely no later than the beginning of spring term in their junior year.

Requirements

The English department offers two undergraduate major tracks culminating in the English Bachelor of Arts (BA). Students must complete the general requirements of the College of Arts and Sciences and one of the two tracks listed below.

A minimum of 12 credit hours of upper-division course work for the English major must be completed on the Boulder campus. English courses taken at other colleges must be evaluated by the Department of English. Courses taken in other departments (except approved cross-listed courses) normally do not count toward the English major. English courses taken on a pass/fail basis do not fulfill major requirements. Independent study credit hours cannot fulfill a major requirement unless that requirement is not being offered or available within the year that the student graduates.

Note: For the Advanced Placement examination in English literature and composition, students will receive credit for ENGL 1500 for an exam score of 4 or 5.

Literature

Students must complete the major requirements in effect at the time they formally declare the major. A minimum of 36 credit hours must be earned in the Department of English, 18 of which must be upper division. Requirements may be fulfilled by taking specific courses designated by the Department of English.

Required Courses and Credit Hours

Required Courses

ENGL 2102	Literary Analysis	3
ENGL 2112	Introduction to Literary Theory	3
One course from each of the following:		15
British Literature to 1660		
British Literature, 1660-1900		
American Literature		
Studies in Ethnicity, Race, Disability, Gender and Sexuality		
Literatures in English, 1900 to Present		
Two courses from: Genre, Media and Advanced Writing		6
ENGL 4039	Critical Thinking in English Studies	3
Two required elective courses in English		6

Optional Electives

In addition to the 36 credit hours required for the major, another 9 credit hours may be taken, for a maximum of 45 credit hours in English	9
Total Credit Hours	45

Creative Writing

Students are subject to those major requirements in effect at the time they formally declare the major.

A minimum of 36 credit hours must be earned in the Department of English, 18 of which must be upper division.

Required Courses and Credit Hours

Required Courses

ENGL 2102	Literary Analysis	3
ENGL 2112	Introduction to Literary Theory	3
One course from either of the following:		3
British Literature to 1660		
British Literature, 1660-1900		
One course from one of the following:		3
American Literature		
Studies in Ethnicity, Race, Disability, Gender and Sexuality		
Literatures in English, 1900 to the Present		
One course from: Genre, Media and Advanced Writing		3
ENGL 4039	Critical Thinking in English Studies	3
Six creative writing workshops taken in progressive order, three of which must be upper division, including one at the 4000-level ¹		18
Optional Electives		
In addition to the 36 credit hours required for the major, another 9 credit hours may be taken, for a maximum of 45 credit hours in English		9
Total Credit Hours		45

¹ The sequence of creative writing workshops must begin with ENGL 1191 and proceed through the 2000-level, 3000-level and 4000-level workshops.

Students declare the creative writing track when declaring their English major with the help of an academic advisor. Students should declare no later than the second semester of their junior year. In order to take workshops beyond the 2000-level, students must declare the creative writing track or the creative writing minor. Each workshop may be taken three times for credit, except for ENGL 1191. All students completing the creative writing track must take and complete a 4000-level writing workshop. Students may not take two poetry or two fiction workshops in the department in the same semester. Students must satisfy all prerequisites in sequence with a grade of B or better before moving on to the workshop at the next level.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in English, students should meet the following requirements:

- No later than the beginning of the second semester, declare the English major and begin course work in the major.

- By the end of the fourth semester, successfully complete one-third of the credit hour requirements for the major. For literature track majors, this includes ENGL 2102, an English elective and any 2000-level course for the major. For creative writing track majors, this includes ENGL 2102, ENGL 1191, and ENGL 2021 or ENGL 2051, as well as formal declaration of the Creative Writing track.
- By the end of the sixth semester, successfully complete two-thirds of the credit hour requirements for the major, including ENGL 2112.
- By the end of the eighth semester, successfully complete the remaining major requirements, including ENGL 4039.

Environmental Studies

The Environmental Studies program at CU Boulder is a hub for facilitating interdisciplinary collaboration in environment and sustainability. The program nurtures interdisciplinary academic training for undergraduate and graduate students, provides guidance for students with career aspirations in environment and sustainability venues, promotes diverse professional education experiences, fosters fundamental and applied research, forms meaningful connections with communities beyond the university, and integrates innovative, interdisciplinary programs unified by the themes of environment and sustainability.

Course code for this program is ENV5.

Bachelor's Degree

- Environmental Studies - Bachelor of Arts (BA) (p. 288)

Certificate

- Renewable and Sustainable Energy - Certificate (p. 290)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bhattacharya, Atrayee (https://experts.colorado.edu/display/fisid_156320)

Instructor; PhD, Harvard University

Boykoff, Maxwell Thomas (https://experts.colorado.edu/display/fisid_147562)

Associate Professor; PhD, University of California-Santa Cruz

Carrico, Amanda R. (https://experts.colorado.edu/display/fisid_153054)

Assistant Professor; PhD, Vanderbilt University

Ciplet, David (https://experts.colorado.edu/display/fisid_156064)

Assistant Professor; PhD, Brown University

Collinge, Sharon Kay (https://experts.colorado.edu/display/fisid_107088)

Professor; PhD, Harvard University

Dilling, Lisa (https://experts.colorado.edu/display/fisid_138024)

Associate Professor; PhD, University of California-Santa Barbara

Doak, Daniel Forest (https://experts.colorado.edu/display/fisid_151963)

Professor; PhD, University of Washington

Hale, Benjamin Slater (https://experts.colorado.edu/display/fisid_141456)

Associate Professor; PhD, SUNY at Stony Brook

Hartter, Joel N (https://experts.colorado.edu/display/fisid_154043)
Associate Professor; PhD, University of Florida

Hinckley, Eve-Lyn (https://experts.colorado.edu/display/fisid_147806)
Assistant Professor

Litt, Jill S. (https://experts.colorado.edu/display/fisid_140636)
Associate Professor; PhD, Johns Hopkins University

Miller, Dale Lee (https://experts.colorado.edu/display/fisid_115748)
Senior Instructor; MA, University of Colorado Denver

Neff, Jason C (https://experts.colorado.edu/display/fisid_117652)
Professor; PhD, Stanford University

Newton, Peter (https://experts.colorado.edu/display/fisid_154466)
Assistant Professor; PhD, University of East Anglia (England)

Pielke, Roger A (https://experts.colorado.edu/display/fisid_104166)
Professor; PhD, University of Colorado Boulder

Ritchie, Liesel A. (https://experts.colorado.edu/display/fisid_145347)
Assoc Research Professor

Rogers, Sarah (https://experts.colorado.edu/display/fisid_142221)
Lecturer

Stockton, Keith Michael (https://experts.colorado.edu/display/fisid_143887)
Instructor; PhD, University of Colorado Boulder

Townsend, Alan Ronald (https://experts.colorado.edu/display/fisid_107584)
Professor; PhD, Stanford University

Wessman, Carol A (https://experts.colorado.edu/display/fisid_100909)
PhD, University of Wisconsin-Madison

White, James (https://experts.colorado.edu/display/fisid_102726)
Professor; PhD, Columbia University In the City of New York

Courses

ENVS 1000 (4) Introduction to Environmental Studies

Surveys environmental studies, examining ecological, socioeconomic, political, aesthetic, and technological factors that influence the quality of life on Earth. Required for ENVS majors.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 1001 (4) Introduction to Developing Environmental Solutions

Builds on ENVS 1000 to give students greater understanding of how to approach environmental issues and work toward solutions. Integrates all focal areas of ENVS - sciences, policy, values - with greatest emphasis on learning science, data analysis and critical thinking fundamentals. Uses case studies of local issues to provide context for skill building and synthesis.

Requisites: Requires a prerequisite course of ENVS 1000 (minimum grade C-).

Grading Basis: Letter Grade

ENVS 1150 (3) First-Year Writing in Energy, Environment and Sustainability

Provides development of effective writing skills, knowledge and habits for success in the campus culture using topics related to the environmental sciences, energy, sustainability and academic/career interests. Focuses on the processes in rhetoric, emphasizing skills in creative, analytical and critical thinking, as well as research and presentation using digital and "old fashioned" methods and materials.

Requisites: Restricted to Environmental Studies (ENVS) or Environmental Design (ENVD) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Written Communication

ENVS 2000 (4) Applied Ecology for Environmental Studies

Covers how ecological ideas and principles underlie both the problems and solutions of multiple environmental issues. Ecology of environmental concerns ranging from endangered species to global carbon cycling will be reviewed, including perspectives from physiological, behavioral, population, community and ecosystem ecology. Fulfills intermediate natural science requirement for Environmental Studies major.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2040 and EBIO 2640

Recommended: Prerequisites ENVS 1000 and a course in introductory statistics and two courses in introductory biology or physical geography.

ENVS 2001 (3) Topical Seminar in Environmental Studies

Serves as an introductory seminar to topics in environmental studies. Topics are diverse and include such areas as climate and conflict, food production, land use change, and other emerging areas in environmental studies.

Grading Basis: Letter Grade

ENVS 2100 (2-4) Topics in Applied Environmental Studies

Covers a variety of topics not currently offered in the curriculum: offered depending on instructor availability and student demand. Fulfills application requirement in Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 2840 (1-6) Independent Study

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 3001 (3) Sustainable Solutions Consulting

Introduces students to green design, industrial ecology, and life cycle analysis. Students use basic techniques of environmental auditing to analyze the CU Boulder campus. Fulfills application requirement for Environmental Studies major.

Requisites: Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

Recommended: Requisite any two-semester science sequence.

ENVS 3020 (3) Advanced Writing in Environmental Studies

Offers training in critical thinking and analytical writing skills appropriate to upper-division classes. Writing assignments integrate the subject matter of different topical areas. Fulfills writing requirement for Environmental Studies major.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

Recommended: Prerequisite ENVS 1000.

Additional Information: Arts Sci Core Curr: Written Communication

ENVS 3022 (3) Climate Politics and Policy

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3022

Recommended: Prerequisite ENVS 1000 or GEOG 1972.

ENVS 3030 (3-4) Topics in Environmental Social Sciences

Covers a variety of topics that may include human ecology, environment and society, and quantitative environmental social science. Offered depending upon instructor availability and student demand. Fulfills intermediate social science requirement for Environmental Studies major. Not repeatable for credit.

Recommended: Prerequisite ENVS 1000.

ENVS 3031 (3) Energy and Human Behavior

Examines why people behave the way they do as it relates to energy use and support for energy/climate policy. Addresses questions such as: what motivates people to conserve energy? Why don't people invest in energy efficiency, even when it saves them money? How do you promote pro-environmental behavior? Fulfills intermediate social science requirement for ENVS major.

Recommended: Prerequisite ENVS 1000.

Grading Basis: Letter Grade

ENVS 3032 (3) Environment, Media and Society

Examines how mass media influence our society, specifically with regard to environmental issues and outcomes. Focuses on media influence over environmental politics and policy, environmental public opinion, popular culture, and environmental/scientific knowledge. Fulfills intermediate social science requirement for Environmental Studies major.

Recommended: Prerequisite ENVS 1000.

ENVS 3040 (4) Conservation Biology

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 3040

Recommended: Prerequisite EBIO 2040 or EBIO 2640.

ENVS 3064 (3) Environmental Political Theory

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3064

Additional Information: Arts Sci Core Curr: Ideals and Values

ENVS 3070 (3) Energy and the Environment

Examines contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Includes some basic physical concepts and principles that often constrain choices. No background in physics is required.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 3070

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 3100 (2-4) Topics in Applied Environmental Studies

Covers a variety of topics not currently offered in the curriculum; offered depending upon instructor availability and student demand. Fulfills application requirement for Environmental Studies major.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 3103 (3) Applied Environmental Studies: Mining in Four Corners

Explores mining related issues that have pronounced impact on the environment, economy and politics of the Four Corners region. Students apply their basic knowledge of environmental science, policy and values toward the understanding of and productive discourse about the conflicts and opportunities brought about by the mining industry in the Four Corners region. Course includes a seven day field trip, visiting mining and reclamation sites in New Mexico, Utah and Colorado. Fulfills application requirement for Environmental Studies majors.

Recommended: Prerequisite ENVS 1000 and one year natural science.

ENVS 3140 (3) Environmental Ethics

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 3140

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

ENVS 3173 (3) Creative Climate Communication

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 3173 and THTR 4173

Recommended: Prerequisite ENVS 1000.

ENVS 3434 (3) Introduction to Applied Ecology

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 3434

Requisites: Requires prerequisite courses of CHEM 1113 or CHEN 1211 and CHEM 1221 (all minimum grade D-).

ENVS 3520 (3) Energy and Climate Change: An Interdisciplinary Approach

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3520

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite a two-course sequence in any natural science.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 3525 (3) Intermediate Environmental Problem Analysis: Topical Cornerstones

Engages students in in-depth study of a topic such as climate change, energy, natural resources or sustainability. Through lectures, discussions, readings and activities, students will become conversant with how science, policy and values are integrated in environmental problem solving, and develop their own sense of how to critically engage with proposed solutions. Fulfills cornerstone requirement for Environmental Studies Major. Recommended corequisite: ENVS 3020.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 3600 (3) Principles of Climate

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3601 and ATOC 3600

Recommended: Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 3621 (3) Energy Policy and Society

Examines how society makes decisions about energy, and how these decisions affect the environment and the economy. Uses tools from policy analysis, economics, and other disciplines to build an in-depth understanding of energy's role in U.S. contemporary society. Fulfills Cornerstone requirement of ENVS majors. Recommended corequisite: ENVS 3020.

Recommended: Prerequisites ENVS 1000 and ENVS 3070 or PHYS 3070.

ENVS 3640 (3) Data Analysis for Global Environmental Affairs

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3640

Grading Basis: Letter Grade

ENVS 3800 (3) The Art of Research: The Essential Elements of Research in Environmental Studies

Introduces students to the practice of doing research in environmental studies. Examines how to define a research problem, select methods, design research, construct arguments and evaluate others' research. Aims to familiarize students with the process of doing research and enable them to proceed with confidence in pursuing their own research topics. Recommended for juniors planning to write ENVS honors theses. Fulfills capstone requirement in Environmental Studies major.

Requisites: Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

Recommended: Prerequisite ENVS 3020.

ENVS 3930 (1-3) Internship

Relates classroom theory to practice. Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to students' career goals. Fulfills application requirement in Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ENVS 1000.

ENVS 4027 (3) Inequality, Democracy, and the Environment

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. The course also focuses on the role that global inequality plays in fostering environmental degradation.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4027

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ENVS 4030 (3) Sociology of Climate Change

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4030

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ENVS 4050 (2-4) Field Methods in Ecosystem Science

Studying the relationships among organisms, physical features, biogeochemistry and humans in ecological communities - this is ecosystem science. This course provides conceptual understanding and practical experience conducting research. Students will pose their own scientific questions, learn several field and lab methods, analyze data and design a project. Upon completion, they will have useful skills for internships, jobs and graduate school. Fulfills application requirement in ENVS major. Department enforced prerequisite: ENVS 1000 or two semesters of natural sciences; such as chemistry, geology or biology.

Grading Basis: Letter Grade

ENVS 4100 (3) Special Topics in Environmental Studies

Various topics not normally covered in the curriculum: offered depending on student demand and specialties of faculty. Applied to specialization requirement for Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ENVS 4120 (4) Special Topics in Environmental Studies

Various topics not normally covered in the curriculum; offered depending on student demand and specialties of faculty. Applies to specialization requirement for Environmental Studies major.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

ENVS 4160 (3) Introduction to Biogeochemistry

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4160 and GEOL 4160

Requisites: Requires prerequisite courses of GEOL 3320 or EBIO 3270 and CHEM 1011 (all minimum grade D-).

ENVS 4201 (3) Biometeorology

Introduces this interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans). Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4201

Requisites: Requires a prereq course of GEOG 1001 and APPM1340 and 1345 or APPM1350 or ECON1088 or MATH1081 or 1300 or 1310 or 2510 or ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or PSCI2075 or PSYC3101 or SOCY2061 or 4061 (min grade D-).

ENVS 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5340, EBIO 4340 and EBIO 5340

Recommended: Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

ENVS 4795 (3) Field Methods in Zoology and Botany

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4795 and MUSM 5795

ENVS 4800 (3) Capstone: Critical Thinking in Environmental Studies

Examines a specific environmental topic in depth, synthesizing information from complex and controversial issues. Different course sections present different topics. Fulfills capstone requirement for Environmental Studies major.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) or Geography (GEOG) majors only.

Recommended: Prerequisites ENVS 1000 and ENVS 3020.

ENVS 4840 (1-6) Independent Study

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 4990 (3) Senior Thesis

Supervised project involving original research. Thesis proposal must be accepted by honors chairman. Open only to Environmental Studies majors with at least a 3.30 GPA. Fulfills capstone requirement in Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

Recommended: Prerequisite ENVS 3020.

Environmental Studies - Bachelor of Arts (BA)

The interdisciplinary environmental studies major is administered through the Environmental Studies Program and draws courses from 16 departments and four colleges on the CU Boulder campus.

The major teaches the integration of science, policy and values as applied to environmental issues. Students acquire an awareness of the complexity of factors relating to human interaction with the environment. They become acutely aware that environmental problems have both human and biophysical components, and gain knowledge of the general principles of human-environmental interaction, global habitability, environmental change and sustainable human societies.

International Bachelor of Arts

The International Bachelor of Arts (IBA) is a joint degree between CU Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in environmental studies, in addition to completing all the current requirements for the BA with a major in environmental studies at the home institution, students must complete one full-time semester of an experiential, customized, international learning experience at the non-home institution.

Requirements

Students must complete:

- the general requirements of the College of Arts and Sciences
- foundational courses in sciences, policy, ethics, economics, writing and math
- 12 credit hours of upper-division course work to specialize in an area of interest
- an internship or field course
- a cornerstone course
- a capstone course

Approved courses that fulfill the major requirements are listed on the program's Curriculum (<http://www.colorado.edu/envs/undergraduate-students/curriculum>) webpage. To explore suggested focus areas and learn how to select courses that align with specific interests, visit the ENVS Guidance Documents (<http://www.colorado.edu/envs/undergraduate-students/curriculum/guidance-documents>) webpage.

Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
ENVS 1000	Introduction to Environmental Studies	4
ENVS 1001	Introduction to Developing Environment Solutions	4
ENVS 1150	First-Year Writing in Energy, Environment and Sustainability	3

One mathematics course, such as MATH 1150, in preparation for statistics or calculus.	3-5
One course to fulfill the Foreign Language or Geography MAPS requirement.	3-5
One course from the A&S Core Curriculum: Literature & Arts, Historical Context, U.S. Context or Human Diversity.	3
Exploratory courses for other interests.	3-6
Credit Hours	23-30

Year Two

Complete one biology or earth science sequence: 7-8

EBIO 1210 & EBIO 1230 & EBIO 1220 & EBIO 1240	General Biology 1 and General Biology Laboratory 1 and General Biology 2 and General Biology Laboratory 2
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ATOC 1050 & ATOC 1060 & ATOC 1070	Weather and the Atmosphere and Our Changing Environment: El Nino, Ozone, and Climate and Weather and the Atmosphere Laboratory
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GEOG 1001 & GEOG 1011	Environment Systems: Climate and Vegetation and Environment Systems: Landscapes and Water
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GEOL 1010 & GEOL 1030 & GEOL 1020	Introduction to Geology and Introduction to Geology Laboratory 1 and Introduction to Earth History (or another approved GEOL sequence)
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CHEM 1113 or CHEM 1011 or PHYS 1110 or PHYS 2010	General Chemistry 1 (and lab, if required) or Environn Chemistr 1 or General Physics 1 or General Physics 1	3-5
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PSCI 2106 or PSCI 2116 or PSCI 3206	Introduction to Public Policy Analysis or Introduction to Environmental Policy and Policy Analysis or The Environment and Public Policy	3
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ECON 2010	Principles of Microeconor	4
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Complete one of the following courses in statistics or calculus: 3-5

EBIO 1010	Introduction to Quantitative Thinking for Biologists
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EBIO 4410	Biometry
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GEOG 3023	Statistics for Geography
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MATH 2510	Introduction to Statistics (Fulfills Core: QRMS)
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PSCI 2075	Quantitative Research Methods (Fulfills Core: QRMS)
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PSYC 2111	Psychological Science I: Statistics
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SOCY 2061	Introduction to Social Statistics
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MATH 1300	Calculus 1 (Fulfills Core: QRMS)
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MATH 1310	Calculus, Systems, and Modeling (Fulfills Core: QRMS)	
APPM 1350	Calculus 1 for Engineers (Fulfills Core: QRMS)	
One course from the A&S Core Curriculum: Literature & Arts, Historical Context, U.S. Context or Human Diversity.		3
Exploratory courses for other interests.		3

Credit Hours 26-31

Year Three

ENVS 2000 or EBIO 2040 or CVEN 3434	Applied Ecology for Environmental Studies or Principles of Ecology or Introduction to Applied Ecology	3-4
ENVS 3020	Advanced Writing in Environment Studies	3
ECON 3535 or ECON 3545	Natural Resource Economics or Environmental Economics	3

ENVS 3525 or ENVS 3520 or ENVS 3022 or ENVS 3621	Intermediate Environment Problem Analysis: Topical Cornerstone or Energy and Climate Change: An Interdisc Approach or Climate Politics and Policy or Energy Policy and Society	3
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ENVS 3140 or ENVS 3064	Environmental Ethics or Environmental Political Theory	3
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ENVS 3030 or ENVS 3031 or ENVS 3032	Topics in Environment Social Sciences or Energy and Human Behavior or Environn Media and Society	3
One application course. Options include internship or study abroad.		3
1-3 specialization courses.		3-9
Upper-division Literature & Arts course.		3
Courses for other interests: electives, minors, certificates, second majors.		3-6

Credit Hours 30-40

Year Four

Complete one of the following capstones:		3
ENVS 4800	Capstone: Critical Thinking in Environmental Studies	
ENVS 4990	Senior Thesis	
ENST 4150	Energy Policy Project	
1-3 specialization courses		3-9
Complete the A&S Core Requirements.		3-6
Courses for other interests: electives, minors, certificates, second majors.		3-6

Credit Hours 12-24

Total Credit Hours 91-125

Renewable and Sustainable Energy - Certificate

CU Boulder's undergraduate renewable and sustainable energy certificate equips students with skills and knowledge that transcend traditional disciplines and prepare them for careers in this rapidly growing industry. Open to all majors and all colleges, the certificate combines a broad understanding of the business, policy, economic and institutional aspects of energy with students' own strengths and disciplinary skill sets to foster the critical thinkers and problem solvers who will shoulder the monumental challenge of transforming the global energy system.

Requirements

Similar to a minor but spanning multiple departments, the certificate consists of 18 credit hours (9 credits required, 9 credits electives) and culminates in a senior projects course where students work in groups on semester-long energy policy projects, often with outside organizations, government agencies or energy companies.

Applications for the undergraduate certificate program are only accepted in the spring of each academic year, and are due by March 1.

Required Courses and Credit Hours

Required Courses

ENVS 3070	Energy and the Environment	3
or ECEN 1500	Sustainable Energy	
ENVS 3621	Energy Policy and Society	3
ENST 4150	Energy Policy Project	3

Electives

Students must take 9 credits of qualifying electives. Any of the energy-related courses listed on the RASEI website can count as an elective, and students may petition for other relevant courses, such as independent study courses, to count. In addition, the following courses can also count as electives:

ATOC 3500	Air Chemistry and Pollution	3
ATOC 4800	Policy Implications of Climate Controversies	3
ENVS 3100	Topics in Applied Environmental Studies	2-4

This list will be modified when new energy-relevant courses are offered.

See the RASEI web site (<http://www.colorado.edu/rasei/education/undergraduate-energy-certificate>) for more information.

Ethnic Studies

The field of ethnic studies was born of, and is dedicated to, the struggles for social justice for all people. The Department of Ethnic Studies at CU Boulder draws on this tradition of engaged scholarship to examine how race and the interrelated categories of ethnicity, gender, class and sexuality impact the lives of people in the United States and around the globe.

Our interdisciplinary department offers an undergraduate major and minor in ethnic studies. Faculty members engage in a wide variety of research on the cultures, histories, epistemologies, and experiences in African American, Asian American, Chicana and Chicano, and Native American/indigenous peoples in the U.S. and beyond. Their research and teaching address these topics through critical, transnational, queer, decolonial and comparative perspectives.

Course code for this program is **ETHN**.

Study Abroad

The Department of Ethnic Studies encourages students to participate in the study abroad programs offered through the Office of International Education. These programs give students a deeper understanding of culture and attitudes of people of color in other parts of the world and their carryover into the United States. CU-Boulder partners with several study abroad organizations that offer summer, semester and full year programs in many locations around the world, most notably in Africa, Asia and Latin America. Programs of special interest include study abroad in Australia, Bolivia, Cuba, Dominican Republic, Ecuador, Ghana, Japan, Mexico, Morocco, Peru, South Africa, Spain and Taiwan.

For additional information, contact the Office of International Education. Students should always consult with their academic advisor prior to choosing their study abroad program.

Bachelor's Degree

- Ethnic Studies - Bachelor of Arts (BA) (p. 297)

Minor

- Ethnic Studies - Minor (p. 299)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aldama, Arturo James (https://experts.colorado.edu/display/fisid_130739)
Associate Professor; PhD, University of California-Berkeley

Belknap, Joanne Elizabeth (https://experts.colorado.edu/display/fisid_113617)
Professor; PhD, Michigan State University

Carroll, Clinton R (https://experts.colorado.edu/display/fisid_154726)
Assistant Professor; PhD, University of California-Berkeley

Holmes, Kwame Alfred (https://experts.colorado.edu/display/fisid_152870)
Assistant Professor; PhD, University of Illinois at Urbana-Champaign

King, William M.
Professor Emeritus

Lawson, Angelica Marie (https://experts.colorado.edu/display/fisid_154727)
Assistant Professor; PhD, University of Arizona

Maeda, Daryl Joji (https://experts.colorado.edu/display/fisid_141460)
Associate Professor; PhD, University of Michigan Ann Arbor

Medak-Saltzman, Danika Fawn (https://experts.colorado.edu/display/fisid_145844)
Assistant Professor; PhD, University of California-Berkeley

Perez, Emma Marie (https://experts.colorado.edu/display/fisid_130962)
Professor; PhD, University of California-Los Angeles

Potter, Hillary A (https://experts.colorado.edu/display/fisid_124938)
Associate Professor; PhD, University of Colorado Boulder

Rabaka, Reiland Devaun (https://experts.colorado.edu/display/fisid_141463)
Professor; PhD, Temple University

Sohi, Seema (https://experts.colorado.edu/display/fisid_144616)
Associate Professor; PhD, University of Washington

Walker, Deward
Professor Emeritus

Williams, Bianca Christel (https://experts.colorado.edu/display/fisid_147342)
Associate Professor; PhD, Duke University

Withycombe, Jenny Lind (https://experts.colorado.edu/display/fisid_153354)
Instructor; PhD, University of Tennessee-Knoxville

ETHN 1022 (3) Introduction to Africana Studies

Overview of Africana studies as a field of investigation, its origins and history.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Africana Studies

ETHN 1023 (3) Introduction to Native American and Indigenous Studies

Introduces critical terms, issues, and questions that inform the discipline of American Indian Studies. Examines "historical silences" and highlights how American Indian scholars, poets, and filmmakers use their work to address/redress historical subjects, and represent their Native communities.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American Indian Studies

ETHN 1025 (3) Introduction to Asian American Studies

Examines the various factors that define minority groups and their positions in American society using Asian Americans as a case study. Emphasizes the perspectives and methodologies of the discipline of ethnic studies.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Asian American Studies

ETHN 1123 (3) Exploring a Non-Western Culture: Hopi and Navajo

Explores two American Indian cultures, Hopi and Navajo and cultural interrelationships from the prehistoric through the contemporary period, using an integrated, holistic and humanistic viewpoint.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 1120
Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American Indian Studies

ETHN 2001 (3) Foundations: Race and Ethnicity in the United States

Introduction to race, ethnicity and gender in the United States. Focuses on the five major racialized groups (African Americans, Asian Americans, Chicanas and Chicanos, European Americans and Indigenous peoples) in the U.S. The course design centers on historical and contemporary ideologies and systems that have constructed and continue to define, shape, and impact the significance of race and ethnicity in our economic, political and social lives.

Additional Information: Departmental Category: Crosscultural/
Comparative Studies

ETHN 2004 (3) Themes in American Culture 1

Enables students to explore various themes in pre-1865 American culture. Examines these themes, which vary each year, in their social context.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Studies

ETHN 2013 (3) Critical Issues in Native North America

Explores a series of issues including regulations of population, land and resource holdings, water rights, education, religious freedom, military obligations, the sociopolitical role of men and women, self-governance, and legal standing as these pertain to American Indian life.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: United States Context
Departmental Category: American Indian Studies

ETHN 2014 (3) Themes in American Culture 2

Enables students to explore various themes in post-1865 American culture. Examines these themes, which vary each year, in their social context.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Studies

ETHN 2044 (3) Crime and Society

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, and how the institutions designed to address crime (police, courts, corrections) function.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 2044

Additional Information: Departmental Category: Crosscultural/
Comparative Studies

ETHN 2203 (3) American Indians in Film

Examines images of American Indians in films produced by, and about, Native peoples. Follows the creation of "the Hollywood Indian" from still-photography to contemporary motion pictures. Films are analyzed within historical, social, and artistic contexts, and examined in terms of the impact their images have exerted upon American society at large and Native communities in particular.

Additional Information: Departmental Category: American Indian Studies

ETHN 2215 (3) The Japanese American Experience

Surveys the Japanese American experience, emphasizing post-WWII developments. Gives attention to intragroup diversity having to do with generation, ethnicity, ecology, and gender.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asian American Studies

ETHN 2232 (3) Contemporary African American Social Movements

Examines selected case studies of African American collective behavior in a historical context. Emphasizes an in-depth investigation of the continuing African American struggle for social/democratic rights.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Africana Studies

ETHN 2242 (3) African American Social and Political Thought

Introductory course designed to acquaint students with historical and contemporary thinking, writings, and speeches of African Americans.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav,
Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies
Departmental Category: Africana Studies

ETHN 2304 (3-4) Introduction to Social Justice

Provides undergraduate students with an understanding of how social systems, primarily the educational and health care systems, are key to understanding injustices and criminalization. Topics covered will include trauma and victimization, food and housing justice, educational justice, physical and mental health justice, mass incarceration, #BlackLivesMatter and restorative justice.

Additional Information: Departmental Category: American Studies

ETHN 2432 (3) African American History

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

Equivalent - Duplicate Degree Credit Not Granted: HIST 2437

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: United States Context
Departmental Category: Africana Studies

ETHN 2536 (3) Survey of Chicana/o History and Culture

Through historical and social scientific studies, novels, autobiographies, testimonies, films, music, and art, this course will provide students a survey of Chicana/o history and culture. Historical overviews of Chicana/o peoples from Mesoamerica; the Spanish Conquest; the historical presence of Chicana/o peoples in the Southwest; the rise of the Chicana/o student and community movements; immigration issues; and the gender, sexuality, and criminalization issues.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: United States Context
Departmental Category: Chicana/o Studies

ETHN 2546 (3) Chicana and Chicano Fine Arts and Humanities

Provides foundation for study of Chicano literature, music, the plastic arts, theatre and film. Also introduces aesthetic and critical concepts and their applications in Chicana and Chicano studies.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chicana/o Studies

ETHN 2703 (3) American Indian Religious Traditions

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2700
Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Ideals and Values
Departmental Category: American Indian Studies

ETHN 2713 (3) American Indian Literature

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2717
Additional Information: Departmental Category: American Indian Studies

ETHN 2732 (3) Survey of African American Literature 2

Surveys African American literature from the Deprssion to the present.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2737
Additional Information: Departmental Category: Africana Studies

ETHN 2746 (3) Chicana/Chicano and Mexican Literature

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2747
Additional Information: Departmental Category: Chicana/o Studies

ETHN 2761 (3) Survey of Post-Colonial Literature

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2767
Additional Information: Departmental Category: Crosscultural/
Comparative Studies

ETHN 3015 (3) Asian Pacific American Communities

Covers the concepts, methods, and theories commonly used in community research, as well as substantive information on selected Asian/Pacific American communities. Emphasizes the ethical/political dimensions of community studies.

Recommended: Prerequisite ETHN 1025 or ETHN 2001.
Additional Information: Arts Sci Core Curr: Contemporary Societies
Arts Sci Core Curr: United States Context
Departmental Category: Asian American Studies

ETHN 3024 (3) Introduction to Critical Sports Studies

Learn to think in an informed and critical way about sports in society. Examine the socio-cultural significance of sports as it relates to topics such as youth, social class, race/ethnicity, gender, identity, and intercollegiate athletics. Readings, class discussions, videos, and guest speakers will help expand our understanding of this important social phenomenon.

Additional Information: Departmental Category: Crosscultural/
Comparative Studies

ETHN 3026 (3) Women of Color: Chicanas in U.S. Society

Critically explores the Chicana experience and identity. Examines issues arising from the intersection of class, race, and gender. Focuses on controversies surrounding culture and gender through an analysis of feminism and feminismo.

Recommended: Prerequisite ETHN 2001 or ETHN 2536.
Additional Information: Departmental Category: Chicana/o Studies

ETHN 3044 (3) Race, Class, Gender, and Crime

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3044 and
WGST 3044

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/
Comparative Studies

ETHN 3101 (3) Selected Topics in Ethnic Studies

Intensive examination of a particular topic, theme, issue, or problem in ethnic studies as chosen by the instructor.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/
Comparative Studies

ETHN 3102 (3) Selected Topics in African American Studies

Intensive examination of a particular topic, theme, issue, or problem concerning the African American presence, as chosen by the instructor. Sample offerings could include African American Pop Culture, the Civil Rights Movement, or other African American issues.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 1022 or ETHN 2001.

Additional Information: Departmental Category: Africana Studies

ETHN 3103 (3) Selected Topics in American Indian Studies

Examines a particular topic, theme, issue, or problem in American Indian Studies.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001 or ETHN 2203.

Additional Information: Departmental Category: American Indian Studies

ETHN 3104 (3) Selected Topics in American Studies

Critically examines American identity and experiences, past and present, focusing on ethnicity, gender, popular culture, and political culture.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: American Studies

ETHN 3105 (3) Selected Topics in Asian American Studies

Intensive examination of a topic or issue affecting Asian Americans, such as the Japanese American internment during World War II, or Asian American social movements or community organizations.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 1025 or ETHN 2001.

Additional Information: Departmental Category: Asian American Studies

ETHN 3106 (3-6) Selected Topics in Chicana and Chicano Studies

Intensive examination of a particular topic, theme, issue, or problem in Chicana and Chicano studies as chosen by the instructor.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 3136 (3) Chicana Feminisms and Knowledges

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images, and film portrayals.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3135

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chicana/o Studies

ETHN 3201 (3-4) Multicultural Leadership: Theories, Principles and Practices

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of western and non-western theories and practices. Community service required.

Equivalent - Duplicate Degree Credit Not Granted: INVS 3100

Recommended: Prerequisite ETHN 2001.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Crosscultural/Comparative Studies

ETHN 3212 (3) Introduction to Hip Hop Studies

Examines critical questions posed by hip hop culture. Accentuated in this course are hip hop's contributions to the political-economic, philosophical, and sociological study of race, racism, sexism and sexuality. Examines the ways in which hip hop, as a new social phenomenon, cultural force and aesthetic form, have influenced contemporary American and global culture.

Recommended: Prerequisite ETHN 1022 or ETHN 2001.

Additional Information: Departmental Category: Africana Studies

ETHN 3213 (3) American Indian Women

Explores the experiences, perspectives, and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity, and activism, especially in maintaining Indigenous traditions.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3210

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite ETHN 1023 or ETHN 2001 or WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: American Indian Studies

ETHN 3252 (3) African American Urban History

Fosters a better understanding and appreciation of the role African Americans have played in the evolution and shaping of urban America. Employs techniques of urban studies to more effectively assess the many dimensions, subtleties, and insensitivities of life in the city. S. and Afro-American history.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1022 or ETHN 2001 and a working knowledge of U.

Additional Information: Departmental Category: Africana Studies

ETHN 3301 (3) Elements of Religion

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 3300

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3314 (3) Violence Against Women and Girls

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3314 and WGST 3314

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3403 (3) Indigenous Rights and Red Power Movement

Deals with historical events involving conflicts between the U.S. government and American Indians. Examples include the role of the FBI in the Pine Ridge Sioux Reservation (1972-76) or the 1864 massacre of the Cheyenne and Arapaho Indians in Colorado territory. Additional courses may relate to tribal governments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1023 or ETHN 2001.

Additional Information: Departmental Category: American Indian Studies

ETHN 3501 (3) Theory/Methods/Writing in Ethnic Studies

Preparation for empirical inquiry in Ethnic Studies. Emphasizes philosophy of social science and cultural studies. Students engage rigorous, theoretical concepts to understand research methods. Prepares students for writing a lengthy, cogent research paper.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Ethnic Studies (ETHN) majors only.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3575 (3) Japanese American Internment: Critical Thinking in Sociocultural Diversity

Offers a historical overview of the Japanese American experience in the United States. Introduces and explores fundamental issues inherent in the study of human beings from the perspective of cultural social difference.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1025 or ETHN 2001.

Additional Information: Departmental Category: Asian American Studies

ETHN 3671 (3) People of Color and Social Movements

People of color the world over are struggling for sovereignty, independence, civil and human rights, food security, decent wages and working conditions, healthy housing, and freedom from environmental racism and other forms of imperialism. Course analyzes and brings alive these struggles.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 2001.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Crosscultural/Comparative Studies

ETHN 3692 (3) African Am Music: Fr Spirituals and the Blues to Rap/Hip Hop Soul

Offers an overview of the origins and evolution of African American music. Guides students through the musical history, as well as the social, political and cultural history, of the spirituals, blues, ragtime, jazz, gospel, freedom songs, rhythm and blues, rock and roll, soul, funk, disco, techno, house, rap and hip hop soul.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ETHN 1022 and ETHN 2001 and ETHN 3212.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Africana Studies

ETHN 3701 (3) Gender, Sport and Culture

Critically examines the experiences of girls and women in American sport from a psycho-socio-cultural perspective with a particular emphasis on the constructs of gender, race, class and sexuality and how these constructs both independently and collectively mediate the female sport experience. Explores theories and interpretive frameworks from sport studies, feminist studies, race studies, psychology and cultural studies.

Recommended: Prerequisite ETHN 3024.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3702 (3) African American Sport Experience

Provides a socio-cultural and historical overview of the contributions of African Americans (men and women) to sport in America. Focus is on the macro (patterns of behavior related to large-scale social structures and processes) and micro (behaviors we observe in society, often readily observable in the context of sport and exercise) level of sport analysis.

Recommended: Prerequisite ETHN 3024.

Additional Information: Departmental Category: Africana Studies

ETHN 3704 (3) Athlete as a National Symbol: Nationhood/Nationalism, Sport

Explores the nationalistic terrain of US sport as a way to understand how athletes became a symbol of nationhood and how they are influenced by, and themselves influence, other aspects of US society and culture. Using historical and contemporary examples, this course examines how race, gender, sexuality, economics and the media constructed the nationalistic world of sports today.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3841 (1-6) Undergraduate Independent Study

Consult the Department of Ethnic Studies for information. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland

Engaging with the ways in which race, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5001 and FILM 4001

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4006 (3) Chicana/Chicano Native American Cultures of the U.S.

Theoretically engaged seminar considers intersections of Chicana/o and Native American studies to shape our scholarly understanding of the U.S. and Mexico borderlands. Ethnographies, historical studies, novels, film, and music will be used to understand the processes of Spanish and Euro-American colonization, neocolonialism, identity formation, gender, syncretism, and mestizaje.

Requisites: Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4084 (3) Punishment, Law and Society

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society. Department enforced prerequisite: SOCY 1001 or SOCY 1004.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4084

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4102 (3) Special Topics in Africana Studies

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5102

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4106 (3) Special Topics in Chicana and Chicano Studies

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4106

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4116 (3) Spoken Word Latino Poetics and Poetry

This is a writing intensive workshop in contemporary poetry writing and Chicana/o and Latina/o poetics-specifically, Nuyorican and Afro-Latino (the Nuyorican Poets Cafe). The purpose of the course is dual-fold: 1) students will be encouraged and empowered to express and develop their poetic voice; 2) students will be challenged to develop and refine their poetic craft. Examines primarily Chicana and Latino specific poetic expression that reflects the cultural mestizaje of Chicano/a and Latina/o peoples.

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Requisite 6 credits in any ETHN class.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4213 (3) Indigenous Futurisms: Speculative Genres and Native Tomorrows

Examines how Indigenous authors, artists and filmmakers have recently begun exploring the genres of Horror, Science Fiction and Fantasy. Considers this shift in light of past and present Native realities. Explores why this shift is happening now, how it helps communities and individuals make political statements, address/redress historical subjects and help to build better futures for us all.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: American Indian Studies

ETHN 4232 (3) The Life and Thought of Martin Luther King Jr

An intensive exploration and examination of the life and thought of the Rev. Dr. Martin Luther King Jr. Special emphasis on the stages of his life and their corresponding productions.

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4272 (3) W.E.B. Du Bois Seminar

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5272

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Departmental Category: Africana Studies

ETHN 4306 (3) The Chicana and Chicano and U.S. Social Systems

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5306

Requisites: Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5353 and RLST 4353 and RLST 5353

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4504 (3) Ethnic-American Autobiography

Investigates the genre of autobiography in America from its inception to the present. American autobiography has been associated with the invention of national character and, thus, is a site of cultural contestation and identity formation. Its changing form crosses disciplinary lines and provides a site for discourses on ethnicity, class, gender, sexuality, age, family, religion and other American cultural conflicts.

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Studies

ETHN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4552 and ETHN 5552

Requisites: Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Africana Studies

ETHN 4553 (3) Indigenous Representations in the United States

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5553

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1023.

Additional Information: Departmental Category: American Indian Studies

ETHN 4632 (3) Frantz Fanon Seminar

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5632

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Departmental Category: Africana Studies

ETHN 4672 (3) Seminar on the Civil Rights and Black Power Movements

A review of the ideas, events, persons, organizations oriented to the quest for African American social justice in the decade of the sixties.

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4692 (3) Special Topics in Multicultural and Ethnic American Literature

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4697

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4714 (3) Sport and Social Justice

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5714

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Recommended: Prerequisite ETHN 3024.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4841 (1-6) Independent Study

Work with an approved faculty sponsor to explore a topic in greater depth. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4951 (3) Senior/Graduate Seminar in Ethnic Studies

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5951

Requisites: Requires prerequisite courses of ETHN 2001 and ETHN 3501 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4961 (3) Honors Thesis 1

Supervised original research project in the field of ethnic studies. The goal is to make substantial progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced restriction: application and acceptance into the ETHN Honors Program.

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Arts Sciences Honors Course

Departmental Category: Crosscultural/Comparative Studies

ETHN 4971 (3) Honors Thesis 2

Supervised original research project in the field of ethnic studies. The goal is to complete progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced prerequisite: application and acceptance into the ETHN Honors Program.

Requisites: Requires prerequisite courses of ETHN 2001 and ETHN 4961 (all minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Arts Sciences Honors Course

Departmental Category: Crosscultural/Comparative Studies

Ethnic Studies - Bachelor of Arts (BA)

The department offers an undergraduate major and minor in ethnic studies.

The department offers courses in five areas of concentration: Africana Studies, American Indian Studies, Asian American Studies, Chicana

and Chicano Studies, and Comparative Ethnic Studies. In addition, they can take classes in the area of Critical Sports Studies (<http://www.colorado.edu/ethnicstudies/undergrad/css.html>).

Concurrent Degree Program BA/MA in Ethnic Studies and Education

The School of Education and Department of Ethnic Studies have partnered to support the 4+1 degree program that reflects each unit's commitment to educational opportunity, diversity, and engaged scholarship examining how race and the interrelated categories of ethnicity, disabilities, language, gender, class, and sexuality impact the lives of people locally and globally.

The new 4+1 Ethnic Studies and Education Concurrent Degree Program offers you an efficient and rigorous path toward earning a Bachelor's Degree in Ethnic Studies and a Master's Degree in Education in five years.

The program invites highly focused ethnic studies students who are interested in applying their critical thinking skills and dedication to social justice to transformative careers in education.

This new program offers two distinct Bachelor and Master's degree pathways:

- BA in Ethnic Studies and an MA in Curriculum & Instruction + teacher licensure for those students in Ethnic Studies who are interested in becoming licensed teachers at either the Secondary English, Social Studies, or Elementary levels.
- BA in Ethnic Studies and an MA in Educational Foundations, Policy and Practice for those interested in policy and curricular issues and developing an interdisciplinary lens in graduate level research.

Admissions

You may apply at the beginning of your junior year or at anytime thereafter prior to completion of your undergraduate studies. Applications are submitted to and reviewed by the School of Education.

Applicants must:

- Have declared Ethnic Studies as a major
- Have completed all MAPS requirements
- Have a minimum GPA of 3.0.

Applications

- Three letters of reference. Two letters must come from professors with whom you have taken Ethnic Studies or Education courses. The third letter may be from a professor, instructor, or supervisor in a community or educational setting
- Personal Statement
- 25 Hours of Youth Experience (for the MA in Curriculum & Instruction + teacher licensure only)

Continuation in the Program

Once admitted, students must:

- Maintain a cumulative GPA of 3.0.
- Complete 6 credits of graduate-level coursework by the second semester of senior year.

The BA/MA has a required 5-year time limit. You must complete all requirements for the BA by the end of your 8th semester and complete all requirements for the MA by the end of your final 5th year.

Contact Us

Completing the 4+1 program requires careful planning. Consult your advisor early to help chart your degree plan.

Contact education advisors at edadvise@colorado.edu or 303-492-6555

Contact ethnic studies advisors at ethnicst@colorado.edu or 303-492-8852

Requirements

In addition to the general requirements of the College of Arts and Sciences, students must complete 33 credit hours of ethnic studies requirements: 12 credit hours of required ethnic studies core classes and an additional 21 credit hours in ethnic studies, 15 credit hours of which must be upper division for a total of 24 upper-division credit hours in the major (required courses mentioned below are included). The 21 credit hours in ethnic studies can be selected from the current ethnic studies course offerings; they may include courses that are cross-listed with the Department of Ethnic Studies, as listed in this catalog.

A grade of C- or better must be received in all courses used to satisfy the major requirements, with an overall average of 2.00 in the major. No more than 6 credit hours may be taken in independent study. No *pass/fail* graded courses may satisfy the 33-credit-hour minimum requirement.

Required Courses and Credit Hours

Required Courses

ETHN 2001	Foundations: Race and Ethnicity in the United States	3
ETHN 3501	Theory/Methods/Writing in Ethnic Studies	3
ETHN 4951	Senior/Graduate Seminar in Ethnic Studies	3
Select one of the following:		3
ETHN 3101	Selected Topics in Ethnic Studies	
ETHN 3102	Selected Topics in African American Studies	
ETHN 3103	Selected Topics in American Indian Studies	
ETHN 3105	Selected Topics in Asian American Studies	
ETHN 3106	Selected Topics in Chicana and Chicano Studies	

Elective Courses

21

A minimum of 21 credit hours in ETHN electives, 15 credit hours of which must be upper division courses in the major. The 21 credit hours in electives can be selected from the current ETHN course offerings; they may also include coursework from outside the department, as approved by the department's curriculum committee and advisor.

Total Credit Hours 33

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in ethnic studies, students should meet the following requirements:

- Declare ethnic studies as their major.
- Complete at least 12 credit hours toward the ethnic studies major requirements by the fourth semester.
- Complete at least 21 credit hours toward the ethnic studies major requirements by the end of the sixth semester.
- Complete ETHN 2001 no later than the fourth semester.
- Complete ETHN 3501 not later than the seventh semester.

- Complete at least one ethnic studies selected topics course selected from the following: ETHN 3101, ETHN 3102, ETHN 3103, ETHN 3105 or ETHN 3106 no later than the eighth semester.
- Complete ETHN 4951 no later than the eighth semester.

Ethnic Studies - Minor

The minor emphasizes engaged scholarship that examines how race and the interrelated categories of ethnicity, gender, class, and sexuality impact the lives of people in the United States and around the globe.

Declaring a Minor

To declare a minor, please pick up the required form in the Ethnic Studies office in Ketchum 184. Alternately, you may schedule an appointment with our advisor (<http://www.colorado.edu/ethnicstudies/undergrad/advisor.html>).

Requirements

A minor is offered in ethnic studies. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. To obtain the ethnic studies minor, students must:

- Declare a minor in ethnic studies
- Complete 18 credits hours in ethnic studies course work

Required Courses and Semester Credit Hours

ETHN 2001	Foundations: Race and Ethnicity in the United States	3
Complete 15 credit hours from elective courses in the Department of Ethnic Studies. Nine credit hours of the elective courses must be at the upper-division (3000-4000) level		15
Total Credit Hours		18

Film Studies

The Film Studies Program educates students in the history and development of film as an art form and contemporary medium. The curriculum instills an informed analytic awareness of the ways in which film has been used and provides the resources for significant creative exploration of the medium.

The undergraduate degrees in film studies emphasize knowledge and awareness of:

- the major artistic contributions to the evolution of film, from the advent of the moving image to the present;
- the general outlines of world film from the silent period to the present, with emphasis on the historical contributions of major national cinemas; and
- film criticism and film theory.

Students completing either the BA or the BFA degree in film studies are expected to acquire the ability and skills to:

- analyze and interpret films critically;
- communicate such interpretations competently in essay form; and
- make a short creative film or video work (BA Production and BFA only).

NOTE: Admission to any class after the third meeting of the class is contingent on professor permission. The department may drop a student from a class if the student misses the first two classes of the semester.

Course code for this program is FILM.

Bachelor's Degrees

- Film Studies - Bachelor of Arts (BA) (p. 306)
- Film Studies - Bachelor of Fine Arts (BFA) (p. 309)

Minor

- Film Studies - Minor (p. 311)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Acevedo-Munoz, Ernesto R (https://experts.colorado.edu/display/fisid_113061)

Professor; PhD, University of Iowa

Barlow, Melinda B (https://experts.colorado.edu/display/fisid_109696)
Associate Professor; PhD, New York University

Espelie, Erin Marie (https://experts.colorado.edu/display/fisid_148671)
Assistant Professor; MFA, Duke University

Ganguly, Suranjan (https://experts.colorado.edu/display/fisid_102045)
Professor; PhD, Purdue University

Gatten, David (https://experts.colorado.edu/display/fisid_156495)
Professor; MFA, School of the Art Institute of Chicago

Lawson, Angelica Marie (https://experts.colorado.edu/display/fisid_154727)

Assistant Professor; PhD, University of Arizona

Liotta, Jeanne M. (https://experts.colorado.edu/display/fisid_145808)
Associate Professor; BFA, New York University

Lundy, Tiel Louise (https://experts.colorado.edu/display/fisid_151085)
Instructor; PhD, University of Denver

Marslett, Geoffrey C (https://experts.colorado.edu/display/fisid_155970)
Assistant Professor; MFA, University of Texas at Austin

Osborn, Christopher (https://experts.colorado.edu/display/fisid_142982)
Instructor; MFA, University of Colorado Boulder

Palmer, James
Professor Emeritus

Sears, Kelly L (https://experts.colorado.edu/display/fisid_154467)
Assistant Professor; MFA, University of California-San Diego

Solomon, Phillip (https://experts.colorado.edu/display/fisid_100867)
Professor; MFA, Massachusetts College of Art

Yannacito, Donald R (https://experts.colorado.edu/display/fisid_103944)
LecturerSr Instructor Attendant Rank

FILM 1002 (3) Film Analysis for Non-Majors

Introduces the critical study of film, exploring theoretical, historical and technical concerns while presenting a survey of important film periods and genres. Students will hone critical-thinking, close-analysis, and writing skills. Covers a wide variety of films, approaching them from numerous perspectives, considering both the effects films have on individual viewers and their ability to reflect culture.

Additional Information: Departmental Category: Genre and Movements

FILM 1502 (3) Introduction to Film Studies

Introduces basic media literacy by exploring the technical and aesthetic principles behind the production, analysis and interpretation of films. Explores comprehension and thinking about movies critically as technological, cultural and artistic products. Study of films in different social and historical contexts and discussion of the importance of movies as cultural products.

Additional Information: Departmental Category: Genre and Movements

FILM 2000 (3) Moving Image Foundations I

Introduces students to basic image making technology, aesthetics and methods. Fundamentals of film/video production in Super 8mm film, Digital ProRes 422 and other analog and digital image making, editing and management formats. May emphasize personal, experimental or narrative approaches with individual exercises, according to instructor. Basic competencies include composition, lighting, basic audio, basic editing, studio critique, file management, web upload, etc.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Production

FILM 2002 (3) Recent International Cinema

Familiarizes students with current trends and major directors in international cinema. Students attend specific films screened in class and/or offered in the International Film Series, and read and write about these films.

Recommended: Prerequisite FILM 1502 or 6 hours humanities courses involving critical writing.

Additional Information: Departmental Category: Genre and Movements

FILM 2003 (3) Film Topics

Varying topics on important individuals, historical developments, groupings of films, film directors, critical and theoretical issues in film.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Topics

FILM 2004 (3) CU Film Studies Seminar: The Telluride Film Festival

Offers students a unique first-hand understanding of the significance of the film festival circuit in the context of global film culture and scholarship. Students will attend Telluride Film Festival screenings, discussions and Q&A sessions. After the festival, weekly screenings of select films from the previous year's festival offer insight into the festival's influence on box-office and the industry's award season.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intensive and Small Courses

FILM 2005 (3) Form, Structure, and Narrative Analysis

Analyzes the form and structure of narrative, experimental non-narrative, and documentary films. Familiarizes students with the general characteristics of the classic three-act structure, principles of adaptation, form and content of experimental films, structural approaches, and the basic formal, narrative, and rhetorical strategies of documentary filmmaking.

Requisites: Requires prerequisite or corequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Workshops

FILM 2010 (3) Moving Image Computer Foundations

Provides students with artistic foundational hands-on experience in integrated use of media software in both the PC and Mac creative imaging making digital working environments. Includes fundamentals in general computer maintenance, creative and practical audio editing, image management and manipulation, and creative moving image practice.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 2105 (3) Introduction to the Screenplay

Explores, through close reading and original student work, the form and structure of the screenplay from the writer's perspective. Students will begin by analyzing structural and character elements of such screenplays as *Chinatown* and *Witness*, then analyze screenplays of their choosing. Students will learn the basics of screenwriting form, then develop and write 10 minutes of an original screenplay. Non-majors admitted with instructor's consent.

Requisites: Requires prerequisite or corequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Workshops

FILM 2300 (3) Beginning/Intermediate Filmmaking

Covers basic camera, editing, and splicing techniques for Super-8 film. Equipment is available at the film studies office for a modest rental fee.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 2312 (3) Film Trilogies

Study of films designed as trilogies, drawing on a wide range of international cinema. Films include Satyajit Ray's *Apu Trilogy* (India), Krzysztof Kieslowski's *Three Colors Trilogy* (Poland), Francois Truffaut's *Antoine Doinel cycle* (France), and Abbas Kiarostami's *Iran Trilogy* (Iran). Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Genre and Movements

FILM 2500 (3) Moving Image Foundations II

Instructs students in developing a technical and aesthetic understanding of the principles of analog and digital cinematography. Technical, creative and studio critique emphasis on the Bolex 16mm RX and Black Magic Pocket Cinema cameras, advanced composition, grammar and mechanics of cinema editing, film/digital lighting (exposure, latitude) multi-format origination and file management, non-sync sound techniques, etc.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2000 or FILM 2300 (all minimum grade C). Restricted to FILM (FILM or FMST) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Production

FILM 2513 (3) Major Asian Filmmakers

Surveys the major Asian directors from China, India, Japan, Taiwan, and Vietnam. Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: Topics
Departmental Category: Asia Content

FILM 2521 (3) Classics of the Foreign Film: 1960s to Present

Surveys the classics of international cinema from the 1960s to the present. Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: History

FILM 2610 (3) Animation Production

Includes analysis of independent and experimental animation and an introduction to various animation techniques (object, line, collage, sand or paint on glass, Xerox, cameraless, pixellation, etc.). Students produce exercise films and a final film exploring these techniques.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 2900 (3) Lighting

Covers the basics of "why you need lighting", color temp, as well as camera techniques, lighting theory, and lighting set-ups for still and motion picture film video. Emphasizes hands on as well as theory.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: Production

FILM 3002 (3) Major Film Movements

Historical-aesthetic survey dealing with various styles, movements, genres or national cinemas. Can be taught in conjunction with the appropriate language department. Typical offers are in the French, the German or the Russian films, etc. Also offers detailed approaches to specific styles, subjects or genres: film comedy, melodrama, the Western, women filmmakers, German expressionist cinema, Italian neorealism, etc. Non-majors will need instructor's consent.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Genre and Movements

FILM 3003 (3) Major Film Directors

Focuses on the work of a single director or a group of related directors. Course content varies each semester. Consult the online Schedule Planner for specific topic. Non-majors need instructor consent.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Topics

FILM 3004 (3) Alfred Hitchcock: The American Films

Intensive survey of Hitchcock's American films from 1940 (Rebecca) to 1964 (Marnie). We will concentrate on in-depth analysis of the most influential and significant films made by the most important movie director of the Hollywood era. We will pay special attention to Hitchcock's deep understanding of the intricacies of film language, style and form in relation to the themes and subjects that interested him: guilt, sex, gender relations, crime and punishment, "mothers". Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3010 (1-3) Film Production Topics

Offers students both theoretical and practical experience in various specialized areas of cinematic production. Topics vary but include production in the documentary, fictional narrative, animation, computer animation, and experimental genres.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3012 (3) Documentary Film

Provides a historical and theoretical introduction to the documentary film. Examines the historical beginnings of documentary film as well as exploring contemporary documentary practice. Canonical moments of documentary history and lesser known examples of documentary film work will be explored.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3013 (3) Women and Film

Examines the representation of women both in mainstream movies and in women's counter-cinema that resists traditional form, content, and spectator-text relationships of Hollywood models. Emphasizes work by key women filmmakers such as Margarethe Von Trotta, Lizzy Borden, and Yvonne Rainer, as well as readings in feminist film theory.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Topics

FILM 3030 (3) Cinema Alternative Process

Explores alternative methods of film processing and filmic image manipulation. Through projects, film screenings, lectures and discussions students will learn fine arts approaches to creative control for the moving image. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2000 or FILM 2300 (all minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 2500.

Additional Information: Departmental Category: Production

FILM 3032 (3) Stage Tragedy and Film

Presents an aerial survey of the history of Western drama as represented in film: Greek drama, the Elizabethans, Ibsen/Strindberg to O'Neill/Williams, Beckett, etc.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3033 (3) Color and Cinema

Examines color and cinema from historical, technological, aesthetic and theoretical perspectives. Students will be required to complete both creative and scholarly assignments.

Additional Information: Departmental Category: Topics

FILM 3041 (3) Environmental Cinema

Interrogates how fiction and nonfiction filmmakers, writers, cinematographers, and moving-image editors have creatively responded to discoveries made in the field of environmental science. Using books by Rachel Carson and Scott MacDonald as a framework, we will examine a broad spectrum of filmmakers (e.g. Wes Anderson, Todd Haynes, Jennifer Baichwal, Bruce Conner, Percy Smith) alongside the most pressing environmental issues.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Film (FILM or FMST) or Environmental Studies (ENVS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: History

FILM 3042 (3) Horror Film

Serious investigation of the horror film genre as well as its origins in, and relation to, works of romanticist literature (e.g., Poe, Shelley). Issues include: the relation of fantasy and reality; gender in horror film; psychological issues raised by the films; historical issues generated by the genre.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3043 (3) Topics in Critical Film Studies

Prepares students for advanced Film Critical Studies work. Subject matter varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Topics

FILM 3051 (4) Film History 1

Intensive introduction to film history from 1895 to 1945. Topics covered include the beginnings of motion picture photography, the growth of narrative complexity from Lumiere to Griffith, American silent comedy, Soviet theories of montage, German expressionist films, and the transition to sound.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Additional Information: Departmental Category: History

FILM 3061 (4) Film History 2

Starts in 1945 and follows the historical growth and evolution of film aesthetics to the present. Studies Italian neorealist, French new wave, and recent experimental films, as well as the films of major auteur figures such as Bergman, Kurosawa, Fellini, Hitchcock, Bunuel, Antonioni, and Coppola.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 3051 (all minimum grade D-).

Additional Information: Departmental Category: History

FILM 3081 (3) Contemporary American Cinema: 1980 to Present

Examines the relationship between American films from 1980 to the present and their cultural and historical context. Includes films by Bigelow, Fincher, Hardwicke, Lee, Linklater, Lynch, Portillo, Stone and Scorsese. Assumes some film knowledge but is not restricted to majors.

Recommended: Prerequisites FILM 1502 and FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Production

FILM 3104 (3) Film Criticism and Theory

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3104

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) FILM (FILM or FMST) or Humanities (HUMN) majors only.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3211 (3) History of Russian Cinema

Surveys Russian cinema in historical and cultural context from early 20th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 3211

Requisites: Requires prerequisite course of FILM 1502 or RUSS 3211 (minimum grade D-).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Production

FILM 3301 (3) Contemporary Issues in Russian Film

Examines the representation of contemporary Russian society in noteworthy Russian films of the last 20 years. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 3301

Additional Information: Departmental Category: History

FILM 3400 (3) Cinema Production I

Exploration of creative cinema production through short production and post-production projects. A short final project will be required.

Focuses on the tactics and strategies of independent cinema production, examining a variety of approaches to genre. Explores a range of film and digital technologies.

Requisites: Requires prerequisites courses of FILM 1502 (minimum grade C) and FILM 2000 and FILM 2500 (both minimum grade of B-). Requires corequisite courses of FILM 3515 and FILM 3525. Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3402 (3) European Film and Culture

Studies the relationships between European film, art and culture. Offered each summer in a different European city (Rome, Paris, London, Athens, Barcelona). There will be regular in-class lectures, film screenings, field trips and on-site teaching.

Repeatable: Repeatable for up to 12.00 total credit hours.

Recommended: Prerequisite introductory film and art history courses.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Genre and Movements

FILM 3422 (3) The Hollywood Musical

Second only to jazz, some critics regard the Hollywood musical as the greatest American popular art form of the 20th century. Proposes a historical, formal and theoretical approach to the musical through its several iterations, from the classical, to the revisionist, to the unusual, placing the changes in the genre's form, structure, and ideology in the context of America's changing social, political and religious values.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3503 (3) German Film Through World War II

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3503

Additional Information: Departmental Category: Topics

FILM 3504 (3) Topics in German Film

Analyzes key issues in German culture as they are represented in film and other media, e.g., technology, architecture, women and the Holocaust. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3504

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3513 (3) German Film and Society 1945-1989

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3513

Additional Information: Departmental Category: Topics

FILM 3514 (3) German Film & Society After 1989

Introduces post-1989 German culture through film. Emphasizes films in their socio-historical contexts and explores developments in German culture during and after the unification.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3514

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3515 (3) Camera Workshop

Focuses on the development of independent cinema production and post-production skills. The instructor must certify students in order to continue with their BFA studies.

Requisites: Requires prerequisites courses of FILM 1502 (minimum grade C) and FILM 2000 and FILM 2500 (both minimum grade of B-). Requires corequisite courses of FILM 3400 and FILM 3525. Restricted to Film (FILM or FMST) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Workshops

FILM 3525 (3) Cinema Editing Workshop

Focuses on the development of independent cinema post-production skills. The instructor must certify students in order to continue with their BFA studies.

Requisites: Requires prerequisites courses of FILM 1502 (minimum grade C) and FILM 2000 and FILM 2500 (both minimum grade of B-). Requires corequisite courses of FILM 3515 and FILM 3400. Restricted to Film (FILM or FMST) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Workshops

FILM 3563 (3) Producing the Film

Focuses on the production process of movie making from idea through distribution, analyzing each of the five phases involved, including the major players, function and problems inherent in each. Emphasizes the critical role the script plays in this process. Designed to give students a "map of the minefield" before venturing out on their own. Offered through Continuing Education.

Additional Information: Departmental Category: Topics

FILM 3603 (3) Sound and Vision

Historical and aesthetic overview of sound in relation to film, ranging from Hitchcock's *Blackmail* to Mailick's *The Thin Red Line*. Pursues issues in sound design, mixing film scores, voiceovers, and film/sound theory in narrative, experimental, and documentary films. Among the filmmakers to be studied are Vertov, Welles, Altman, Brakhage, Lipsett, Eisenstein, Coppola, Scorsese, Stone, Leone, Godard, Nelson. Also explores a limited practicum using Pro Tools for sound design.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Topics

FILM 3620 (3) Experimental Digital Animation

Explores boundaries of traditional animation construction and delve into contemporary animation history. Small projects will involve experimentation with animation techniques that integrate with analog animation, frame-by-frame digital processes and live-action footage. Ideal for students who have taken FILM 2010 or FILM 2610 or FILM 3525. Students familiar with animation and digital imaging or those eager to explore the process are encouraged to enroll.

Additional Information: Departmental Category: Production

FILM 3660 (3) The Postmodern

Analyzes the cultural and critical practices as well as the thought that defines the postmodern period at the end of 20th century.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3660

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: History

FILM 3700 (3) Digital Audio Design

Studies and applies Pro Tools as a post-production audio toolbox. Applied techniques include sound recording, field recording, foley, vocal recording and editing, plug-in generated sound creation, MIDI, basic scoring principles, audio sweetening and audio mixing. Students will be required to complete regular editing assignments in addition to a final soundscape project.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3900 (1-3) Independent Study (Production)

Limit of 3 credit hours per semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Production

FILM 3901 (1-3) Independent Study (Critical Study)

Limit of 3 credit hours per semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: History

FILM 3920 (3) Professional Seminar

Learning aspects of professional development in the field of cinema. Through workshops and assignments students will learn of the many opportunities found within all areas of production. Guests will help inform the students of professional options and expectations. Topics will include: crew work, fund raising, marketing festivals, low budget filmmaking, and alternative venues. Students may have an internship concurrently with this course.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 2500 (minimum grade D-).

Recommended: Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3940 (1-6) Film Studies Internship

Provides students with professional internship experiences with film, video, new media production companies, governmental agencies, production units, audio recording studios and new media industries. Students will be responsible for securing their own internship position.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite CU GPA of at least 2.00 and upper-division standing and a 3.00 GPA as a BA or BFA film studies major.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Production

FILM 3990 (1) Film Practicum

Offers creative and technical experience in aspects of film, video and media production for students in the BFA track and BA production emphasis. Students earn credit by working in any number of "crew" positions for Upper Division Production, MFA productions or faculty projects under the supervision of the course instructor.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Production

FILM 4000 (3) Advanced Digital Postproduction

Through projects, discussions and screenings, explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio, and optical effects treatments. Cannot be taken simultaneously with FILM 3400 or FILM 4400.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5000

Requisites: Requires prerequisite courses FILM 1502 and FILM 2000 or FILM 2300 and FILM 2500 and FILM 3400 or FILM 4400 (all minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland

Engaging with the ways in which racial, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4001 and ETHN 5001

Requisites: Requires prerequisite course of ETHN 2001 (minimum grade D-).

Additional Information: Departmental Category: History

FILM 4003 (3) Film and Literature

Explores similarities and differences between literature and film as narrative arts. Studies several novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5003

Additional Information: Departmental Category: Topics

FILM 4004 (3) Topics in Film Theory

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4004 and ARTF 5004

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) FILM (FILM or FMST) or Humanities (HUMN) majors only.

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 4005 (3) Screenwriting Workshop: Short Form

A writing intensive course that focuses on the art of the short form screenplay. Students will complete regular writing exercises, presentations, and several short scripts.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2005 or FILM 2105 (all minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Workshops

FILM 4010 (1-3) Topics in Film Studies-Production

Prepares students for advanced Film Studies production courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5010

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2000 or FILM 2300 and FILM 2500 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) FILM (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4013 (3) Film, Photography and Modernism

Provides interdisciplinary study of film, photography and modernism, focusing on issues such as dystopia, alienation, sexuality, subjectivity and self-referentiality. Photographs by Stieglitz, Strand, Weston, Evans, Cartier-Bresson, Kertesz and Moholy-Nagy. Films by Dziga-Vertov, Eisenstein, Resnais, Antonioni, Bergman, Bunuel and Bertolucci.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5013

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Topics

FILM 4021 (3) Directing/Acting for the Camera

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research and papers required.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5021

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: History

FILM 4023 (3) Topics in International Cinema

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5023

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) or Fine Arts - Creative Arts (ARTC) majors only.

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Topics

FILM 4024 (3) Advanced Research Seminar

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade. Department enforced requisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5024

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 4043 (1-3) Topics in Film Studies-Critical Studies

Prepares students for advanced Film Studies critical studies courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5043

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Topics

FILM 4105 (3) Advanced Screenwriting

Introduces professional screenwriting in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5105

Requisites: Requires prerequisite course of FILM 4005 (minimum grade D-).

Recommended: Prerequisites FILM 3051 and FILM 3061 and an approved writing sample.

Additional Information: Departmental Category: Workshops

FILM 4135 (3) Art and Psychoanalysis

Explores psychoanalytic theory as it relates to our understanding of literature, film and other arts. After becoming familiar with some essential Freudian notions (repression, narcissism, ego/libido, dreamwork, etc.), students apply these ideas to works by several artists (e.g., Flaubert, James, Kafka, Hoffmann and Hitchcock).

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4135

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Topics

FILM 4200 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5200 and MCEN 4151 and MCEN 5151

Additional Information: Departmental Category: Production

FILM 4240 (3) Beginning Video Production

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4246 and ARTS 5246

Requisites: Requires prerequisite courses of FILM 2000 and FILM 2500 (all minimum grade D-).

Additional Information: Departmental Category: Production

FILM 4340 (3) Intermediate Video Production

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4346 and ARTS 5346

Requisites: Requires prerequisite course of FILM 4240 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 4400 (3) Digital Post-Production Process

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing. Formerly FILM 3600.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5400

Requisites: Requires prerequisite course of FILM 3525 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4440 (3) Advanced Video Production

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4446 and ARTS 5446

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of FILM 4340 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 4453 (3) Elective Affinities: Avant-Garde Film and the Arts

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music, and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5453

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Additional Information: Departmental Category: Topics

FILM 4500 (3) Cinema Production 2

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production leading to the completion of a BFA thesis project exploring either documentary, experimental, or narrative genres.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5500

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 3400 and FILM 3515 and FILM 3525 (all minimum grade C). Restricted to Film (FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4505 (3) Screenwriting Workshop: Long Form

Creative writing workshop in which students plan and write a feature-length screenplay with emphasis on format, dialogue, characterization, and story.

Requisites: Requires prerequisite course of FILM 1502 and FILM 2000 (all minimum grade D-).

Additional Information: Departmental Category: Workshops

FILM 4600 (3) Creative Digital Cinematography

Explores creative approaches to single camera digital cinematography through short projects, discussions and screenings. Relates creative photography and poetic approaches to the digital camera cinema.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5600

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 and FILM 2500 and FILM 4400 or ARTS 4246 or ARTS 5346 (all minimum grade D-). Restricted to Film (FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4604 (3) Colloquium in Film Aesthetics

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0 or instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5604

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 4959 (3-6) Honors Senior Thesis

For exceptional Film Studies majors who wish to write an honors thesis based on independent research or creative work under the direction of a faculty member.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sciences Honors Course

Departmental Category: Intensive and Small Courses

Film Studies - Bachelor of Arts (BA)

The BA in Film Studies at the University of Colorado Boulder emphasizes the critical study of film as an art form. The critical studies BA is designed to give students a solid knowledge of the history and aesthetics of international film, as well as exposure to the various methodological approaches of cinema studies as an academic discipline. Critical studies courses take a multi-faceted approach comprised of film screenings, readings, and lectures, while students are expected to practice their film analysis skills in writing assignments and class discussion. Like many programs in the Arts and Humanities, the BA Program in Film Studies aims more broadly to teach two fundamental skills: critical thinking and writing ability. These skills are developed in our program specifically through the examination of films, but they are also broadly useful well beyond the realm of film studies. The BA program enrolls approximately 425 majors.

Concurrent Degree Program

BA/MA in Film Studies

The film studies bachelor of arts/master of arts critical studies degree gives highly motivated BA students the opportunity to earn an MA degree using an accelerated undergraduate program in combination with a fifth year of study.

Program Description

The BA/MA degree in film studies is a critical studies track under the auspices of the art MA program. This collaboration between the Film Studies Program and the Department of Art and Art History is an extension of our common interests in visual art. The Film Studies tenured and tenure-track faculty also have graduate faculty standing within Art and Art History.

The BA/MA track prepares students for professional careers in teaching and criticism, from the perspective of innovative critical approaches and in preparation for a PhD track at another university. The aim of the BA/MA film program is to aid in the advancement of the scholarly understanding of film art, with emphasis on theoretical and research approaches and their role in academia. The BA/MA will, therefore, prepare its graduates to assume the responsibilities of the academic study of cinema as one of the fine arts and to pursue careers in teaching, research, curating and the overall advancement of the study of cinema as art.

The program offers studies leading to the MA in the areas of film criticism and theory. Advanced students are encouraged to explore interdisciplinary approaches as well as to enhance their program of study with cognate courses in other departments such as history, comparative literature, anthropology, English, women's studies, ethnic studies, Spanish and Portuguese, French and Italian, Germanic and Slavic languages and literature and others. Film studies offers a broad selection of seminar topics on their current faculty research interests and in response to student demand. The Visiting Film Artist program brings additional distinguished, innovative film and video artists and critics to campus and students are encouraged to register for their seminars.

Admission to the Program

- Admission to the program occurs during the second semester of the junior year. Applicant should have a cumulative GPA of 3.3 and have completed all MAPS deficiencies. All applicants will provide a copy of their (internal) CU transcript. (Please note: Applicant should specify on the on the form that they are applying for the spring term, BA/MA degree, major codes AS-FLM2 and GR-ART). After completing the top portion of the form, the student should make an appointment with the Director, Professor Ernesto Acevedo-Muñoz (www.colorado.edu/filmstudies/ernesto-acevedo-munoz) (<http://www.colorado.edu/filmstudies/ernesto-acevedo-munoz>).
- The sole application deadline is the second Monday in October. Please submit the standard BA/MA application form (http://www.colorado.edu/GraduateSchool/academics/_docs/Concurrentapplication.pdf) with your package. Note: Applicants should specify on the form that they are applying for the spring term, BA/MFA degree, major codes AS-FLM2 and GR-ART2.
- Students will secure the sponsorship and/or advisory commitment of a Film Studies faculty member at the rank of assistant professor or higher. The applicant will include a brief letter or statement from the faculty member attesting to the advisory relationship.
- Applicants will submit a one-page prospectus detailing a possible research topic for an MFA thesis. The prospectus must include a minimum bibliography of 10–15 items.
- "October Surprise": Applicants must successfully complete a writing assignment in the form of a 10–12 page analytical/theoretical or historical argument paper on a film determined by the faculty. Students will pick up a DVD and a "prompt" or question in the Film Studies office at 4 p.m. on the Friday before the application is due. Over the weekend, the applicants must watch the movie, do some research, make an argument, and write the paper, which will be handed in with the application Monday at 9 a.m. The "October Surprise" portion of the application process is designed to have students demonstrate their writing skills and their ability to find, define, and argue a topic in a fairly sophisticated manner for an aspiring master's student.
- Only currently enrolled, University of Colorado Boulder students, may be considered for admission to the program. Transfer students must complete at least 24 credit hours as a degree-seeking student before applying to the program.
- Student enrolled in the BA/MA track cannot pursue a double major or double degree of any kind.

Requirements

No more than 6 credit hours of independent study may be credited toward the major. Students must complete the required film courses with a grade

of C or better. The arts and sciences 18-credit-hour minimum of upper-division credit hours must be met with CU film studies courses.

The Film Studies Program strongly urges the purchase of film and sound media-capable Apple computing systems for those pursuing production classes in the BA degree program (see www.colorado.edu/filmstudies (<http://www.colorado.edu/filmstudies>)).

Required Courses and Credit Hours - Critical Studies

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. The Film Studies Critical Studies Program requires a minimum of 44 credit hours in support of the BA requirements, including film courses and courses taken in other departments.

Literature and the Arts Requirement

In addition to the 6-credit-hour literature and the arts core requirement, Film Studies majors must take an additional 6 credit hours (3 of them upper-division) of literature and the arts core courses to satisfy the degree requirements.	6
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Required Film Studies Core Courses

FILM 1502	Introduction to Film Studies ¹	3
FILM 3051 & FILM 3061	Film History 1 and Film History 2 ²	8
FILM 3104	Film Criticism and Theory	3

Critical Studies Elective Requirements

Select 18 credit hours from the following (at least 12 must be upper division):	18	
FILM 2002	Recent International Cinema	
FILM 2003	Film Topics ³	
FILM 2004	CU Film Studies Seminar: The Telluride Film Festival	
FILM 2005	Form, Structure, and Narrative Analysis	
FILM 2312	Film Trilogies	
FILM 2513	Major Asian Filmmakers	
FILM 2521	Classics of the Foreign Film: 1960s to Present	
FILM 3002	Major Film Movements ³	
FILM 3003	Major Film Directors ³	
FILM 3004	Alfred Hitchcock: The American Films	
FILM 3012	Documentary Film	
FILM 3013	Women and Film	
FILM 3032	Stage Tragedy and Film	
FILM 3033	Color and Cinema	
FILM 3042	Horror Film	
FILM 3043	Topics in Critical Film Studies ³	
FILM 3081	Contemporary American Cinema: 1980 to Present	
FILM 3211	History of Russian Cinema	
FILM 3301	Contemporary Issues in Russian Film	
FILM 3422	The Hollywood Musical	
FILM 3503	German Film Through World War II	
FILM 3504	Topics in German Film	
FILM 3513	German Film and Society 1945-1989	
FILM 3514	German Film & Society After 1989	
FILM 3603	Sound and Vision	
FILM 3901	Independent Study (Critical Study) ⁴	
FILM 3940	Film Studies Internship	

FILM 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland
FILM 4003	Film and Literature
FILM 4004	Topics in Film Theory ³
FILM 4013	Film, Photography and Modernism
FILM 4023	Topics in International Cinema ³
FILM 4024	Advanced Research Seminar ³
FILM 4043	Topics in Film Studies-Critical Studies ³
FILM 4105	Advanced Screenwriting
FILM 4135	Art and Psychoanalysis
FILM 4453	Elective Affinities: Avant-Garde Film and the Arts
FILM 4604	Colloquium in Film Aesthetics

Any FILM class crosslisted with another department (i.e., foreign language) that has been approved by the film studies chair

Film Elective Requirements

In addition to required Film classes, Film Studies majors must complete an additional six credit hours of FILM courses 6

Total Credit Hours 44

¹ This course is a prerequisite for FILM 2000 and FILM 3051.

² Must be taken in chronological order. FILM 1502 is a prerequisite.

³ Course may be taken for credit more than once, provided that the topics vary.

⁴ Total number of independent study credit hours cannot exceed 6.

Required Courses and Credit Hours - Production

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. The Film Studies Production Program requires a minimum of 48 credit hours in support of the BA requirements, including film courses and courses taken in other departments.

Literature and the Arts Requirement

In addition to the 6-credit-hour literature and the arts core requirement, Film Studies majors must take an additional 6 credit hours (3 of them upper-division) of literature and the arts core courses to satisfy the degree requirements. 6

Required Film Studies Core Courses

FILM 1502	Introduction to Film Studies ¹	3
FILM 3051 & FILM 3061	Film History 1 and Film History 2 ²	8

Critical Studies Elective Requirements

Select 6 credit hours from the following (at least 3 must be upper division): 6

FILM 2002	Recent International Cinema
FILM 2003	Film Topics ³
FILM 2004	CU Film Studies Seminar: The Telluride Film Festival
FILM 2005	Form, Structure, and Narrative Analysis
FILM 2312	Film Trilogies
FILM 2513	Major Asian Filmmakers
FILM 2521	Classics of the Foreign Film: 1960s to Present
FILM 3002	Major Film Movements ³
FILM 3003	Major Film Directors ³
FILM 3004	Alfred Hitchcock: The American Films

FILM 3012	Documentary Film
FILM 3013	Women and Film
FILM 3032	Stage Tragedy and Film
FILM 3033	Color and Cinema
FILM 3042	Horror Film
FILM 3043	Topics in Critical Film Studies ³
FILM 3081	Contemporary American Cinema: 1980 to Present
FILM 3211	History of Russian Cinema
FILM 3301	Contemporary Issues in Russian Film
FILM 3422	The Hollywood Musical
FILM 3503	German Film Through World War II
FILM 3504	Topics in German Film
FILM 3513	German Film and Society 1945-1989
FILM 3514	German Film & Society After 1989
FILM 3603	Sound and Vision
FILM 3901	Independent Study (Critical Study) ⁴
FILM 3940	Film Studies Internship
FILM 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland

FILM 4003	Film and Literature
FILM 4004	Topics in Film Theory ³
FILM 4013	Film, Photography and Modernism
FILM 4023	Topics in International Cinema ³
FILM 4024	Advanced Research Seminar ³
FILM 4043	Topics in Film Studies-Critical Studies ³
FILM 4105	Advanced Screenwriting
FILM 4135	Art and Psychoanalysis
FILM 4453	Elective Affinities: Avant-Garde Film and the Arts
FILM 4604	Colloquium in Film Aesthetics

Any FILM class crosslisted with another department (i.e., foreign language) that has been approved by the film studies chair

Production Core Courses

FILM 2000	Moving Image Foundations I	3
FILM 2500	Moving Image Foundations II	3
FILM 3400	Cinema Production I	3
FILM 3515	Camera Workshop	3
FILM 3525	Cinema Editing Workshop	3
FILM 3990	Film Practicum	1

Production Electives

Choose one each from 'Structure Foundations' and 'Foundation Elective': 6

Structure Foundations	
FILM 2005	Form, Structure, and Narrative Analysis
FILM 2105	Introduction to the Screenplay
Foundation Elective	
FILM 2010	Moving Image Computer Foundations
FILM 2300	Beginning/Intermediate Filmmaking
FILM 2610	Animation Production
FILM 2900	Lighting
FILM 3030	Cinema Alternative Process

Production Elective

Choose one of the following: 3	
FILM 3010	Film Production Topics

FILM 3620	Experimental Digital Animation
FILM 3700	Digital Audio Design
FILM 3940	Film Studies Internship
FILM 4005	Screenwriting Workshop: Short Form
FILM 4010	Topics in Film Studies-Production
FILM 4021	Directing/Acting for the Camera
FILM 4400	Digital Post-Production Process
Total Credit Hours	
	48

- ¹ This course is a prerequisite for FILM 2000 and FILM 3051.
- ² Must be taken in chronological order. FILM 1502 is a prerequisite.
- ³ Course may be taken for credit more than once, provided that the topics vary.
- ⁴ Total number of independent study credit hours cannot exceed 6.

Graduating in Four Years with a BA

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in film studies, students should meet the following requirements:

- Declare a film studies major by the beginning of the second semester
- Complete the lower- or upper-division literature and the arts requirement (3 credit hours) and FILM 1502 by the end of the fourth semester.
- Complete the upper-division literature and the arts requirement (3 credit hours) and FILM 3051 and FILM 3061 by the end of the sixth semester.
- Complete 6 critical studies elective credit hours and 6 FILM elective credit hours by the end of the seventh semester (at least 3 of these credit hours must be upper-division credit hours).
- Complete an additional 12 credit hours of critical studies elective courses, including at least three upper-division courses (9 credit hours), and FILM 3104 by the eighth semester.

Film Studies - Bachelor of Fine Arts (BFA)

The BFA is a competitive degree program requiring an application and selection procedure. All students begin their Film Studies career declaring the Bachelor of Arts in Film as their major. Students wishing to declare a BFA in Film Studies—the Production track—as their major must first satisfy specific prerequisites. The mission of the BFA is to prepare artists who will be competitive as independent filmmakers. To that end, a central aim of our curriculum is to help prepare students for advanced graduate degrees beyond the BFA degree.

In addition to acquiring the skills to make creative films and video works, students completing the BFA degree will also acquire the ability to analyze and interpret films critically and to communicate such interpretations competently in essay form.

Admission to the BFA Program

The Film Studies Program educates students in the history and development of film as an art form and contemporary medium. The curriculum instills an informed analytic awareness of the ways in which

film has been used and provides the resources for significant creative exploration of the medium.

The BFA degree is competitive. In order to graduate with a BFA degree, students must first satisfy a number of prerequisites and then submit a formal application to the BFA program at the prescribed time (deadline will be posted each semester on the film studies website). Applicants must have a cumulative GPA at CU Boulder of 2.5 or higher, a FILM GPA of 3.3 or higher and have completed 15 credit hours of FILM coursework, including FILM 1502, FILM 2000 and FILM 2500. Applicants must submit a written application, a writing sample and a sample film. Applicants may also submit one additional "best" example of creative work (see specific admission guidelines for details). Admission into the BFA program is contingent upon approval of the application materials by the BFA committee. Students applying after their fourth semester may apply twice to the BFA; students applying subsequent semesters may only apply once. Complete details on the BFA application procedure are available on the film studies website. Students are required to attend a BFA orientation meeting prior to submitting their application. The program recommends that BFA students purchase film and sound media-capable Apple computing systems (see www.colorado.edu/filmstudies (<http://www.colorado.edu/filmstudies>)).

Students are encouraged to consult with the Film Studies advisor in order to obtain advice and current information.

Requirements

No more than 6 credit hours of independent study may be credited toward the major. Students must complete the required film courses with a grade of C or better.

Students must complete the general requirements of the College of Arts and Sciences as well as the required courses listed below. The Film Studies Program requires a minimum of 65 credit hours in support of the BFA degree requirements.

Required Courses and Credit Hours

Literature and the Arts Requirement

In addition to the 6-credit-hour literature and the arts core requirement, Film Studies majors must take an additional 6 credit hours (3 of them upper division) of literature and the arts core courses to satisfy the degree requirements.	6
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Required Critical Studies Courses

FILM 1502	Introduction to Film Studies ¹	3
FILM 3051 & FILM 3061	Film History 1 and Film History 2 ²	8
FILM 2005 or FILM 2105	Form, Structure, and Narrative Analysis Introduction to the Screenplay	3
FILM 4604	Colloquium in Film Aesthetics	3

Required Production Courses

FILM 2000	Moving Image Foundations I ³	3
FILM 2500	Moving Image Foundations II ³	3
FILM 3400	Cinema Production I	3
FILM 3515	Camera Workshop	3
FILM 3525	Cinema Editing Workshop	3
FILM 4500	Cinema Production 2 (Part 1)	3
FILM 4500	Cinema Production 2 (Part II)	3

Production Course Electives

Select 15 credit hours of any combination of the following courses— 15
see degree audit for specifics

FILM 2010	Moving Image Computer Foundations
FILM 2300	Beginning/Intermediate Filmmaking
FILM 2610	Animation Production
FILM 2900	Lighting
FILM 3010	Film Production Topics ⁴
FILM 4400	Digital Post-Production Process
FILM 3030	Cinema Alternative Process
FILM 3563	Producing the Film ⁵
FILM 3620	Experimental Digital Animation
FILM 3700	Digital Audio Design
FILM 3900	Independent Study (Production) ⁶
FILM 3920	Professional Seminar
FILM 3940	Film Studies Internship
FILM 3990	Film Practicum ⁷
FILM 4000	Advanced Digital Postproduction
FILM 4005	Screenwriting Workshop: Short Form
FILM 4010	Topics in Film Studies-Production ⁷
FILM 4021	Directing/Acting for the Camera
FILM 4105	Advanced Screenwriting
FILM 4240	Beginning Video Production
FILM 4340	Intermediate Video Production
FILM 4440	Advanced Video Production
FILM 4505	Screenwriting Workshop: Long Form
FILM 4600	Creative Digital Cinematography ⁷

Critical Studies Elective Requirements

Select 6 credit hours from the following: 6

FILM 2002	Recent International Cinema
FILM 2003	Film Topics ⁴
FILM 2004	CU Film Studies Seminar: The Telluride Film Festival
FILM 2005	Form, Structure, and Narrative Analysis
FILM 2312	Film Trilogies
FILM 2513	Major Asian Filmmakers
FILM 2521	Classics of the Foreign Film: 1960s to Present
FILM 3002	Major Film Movements ⁴
FILM 3003	Major Film Directors ⁴
FILM 3004	Alfred Hitchcock: The American Films
FILM 3012	Documentary Film
FILM 3013	Women and Film
FILM 3032	Stage Tragedy and Film
FILM 3033	Color and Cinema
FILM 3042	Horror Film
FILM 3043	Topics in Critical Film Studies ⁴
FILM 3081	Contemporary American Cinema: 1980 to Present
FILM 3104	Film Criticism and Theory
FILM 3211	History of Russian Cinema
FILM 3301	Contemporary Issues in Russian Film
FILM 3422	The Hollywood Musical
FILM 3503	German Film Through World War II
FILM 3504	Topics in German Film

FILM 3513	German Film and Society 1945-1989
FILM 3514	German Film & Society After 1989
FILM 3603	Sound and Vision
FILM 3901	Independent Study (Critical Study) ⁸
FILM 3940	Film Studies Internship
FILM 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland
FILM 4003	Film and Literature
FILM 4004	Topics in Film Theory ⁴
FILM 4013	Film, Photography and Modernism
FILM 4023	Topics in International Cinema ⁴
FILM 4024	Advanced Research Seminar ⁴
FILM 4043	Topics in Film Studies-Critical Studies ⁴
FILM 4105	Advanced Screenwriting
FILM 4135	Art and Psychoanalysis
FILM 4453	Elective Affinities: Avant-Garde Film and the Arts
FILM 4604	Colloquium in Film Aesthetics

Any FILM class crosslisted with another department (i.e., foreign language) that has been approved by the film studies chair

Total Credit Hours 65

- ¹ This course is a prerequisite for FILM 2000 and FILM 3051.
- ² Must be taken in chronological order.
- ³ Must receive a B- or higher to continue to the next required production course.
- ⁴ Course may be taken for credit more than once, provided the topics vary.
- ⁵ Both are usually offered through Continuing Education; only one may count toward the film studies degree.
- ⁶ Total number of independent study credit hours cannot exceed 6, and they cannot be used to duplicate regular course offerings.
- ⁷ Course may be taken for credit more than once.
- ⁸ Total number of independent study credit hours cannot exceed 6.

Graduating in Four Years with a BFA

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in film studies, students should meet the following requirements:

- Declare and start the film studies major the first semester freshman year.
- Complete FILM 1502, FILM 2000, FILM 2005 or FILM 2105 and one lower- or upper-division critical studies course for 3 credit hours by the end of the third semester.
- Complete the Literature and the Arts lower- or upper-division requirement (3 credit hours), FILM Foundation Elective (3 credit hours) and FILM 2500 by the end of the fourth semester.
- Note: In order to graduate in four years, a student must apply and be accepted into the BFA program at the end of the fourth semester. See "Admission to the BFA Program" for details of the application process.
- Complete FILM 3051, FILM 3400, FILM 3515, and FILM 3525 by the end of the fifth semester.

- Complete FILM 3061, Digital Elective (3 credit hours), Production Elective (3 credit hours) and FILM 3990 by the end of the sixth semester.
- Complete FILM 4500, 3 credit hours upper division critical studies elective, FILM 3990 by the end of the seventh semester.
- Complete 3 additional credit hours of FILM 4500, FILM 4604, an additional 1 credit hour of FILM 3990 and 3 more credit hours of production electives by the end of the eighth semester.

Film Studies - Minor

The Film Studies minor helps students interested in the study of cinema history, culture and aesthetics, but who are too busy to pursue the full major, the opportunity to develop their interest by acquiring critical and comparative skills and understanding the place and importance of cinema as a cultural and social phenomenon. Students in the minor have access to lower and upper division courses on film history, aesthetics, criticism, social and historical contexts, classical genres and groundbreaking directors from the U.S. and International traditions, acquiring an edge in visual analysis and media literacy.

Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. To obtain the film studies minor, students must:

- Declare a minor in film studies
- Complete 20 credit hours in film studies course work; requirements including the following:

Required Courses and Semester Credit Hours

FILM 1502	Introduction to Film Studies	3
FILM 3051	Film History 1	4
FILM 3061	Film History 2	4
Complete 9 credit hours from elective courses in the Film Studies Program. Six credit hours of the elective courses must be at the upper-division (3000-4000) level.		9
Total Credit Hours		20

French and Italian

The Department of French and Italian provides instruction in the languages, literatures, cinema, and cultures of France, Italy, and other areas where these languages are spoken.

We offer a wide selection of undergraduate courses (<http://www.colorado.edu/frenchitalian/courses-0>), covering topics ranging from the Middle Ages to Italian-American culture and the Francophone literature of Africa, the Caribbean and the Middle East.

The department offers:

- Majors and Minors in French (<http://www.colorado.edu/frenchitalian/undergraduate/french>) and Italian (<http://www.colorado.edu/frenchitalian/undergraduate/italian>)
- Joint BA/MA (<http://www.colorado.edu/frenchitalian/undergraduate/french/bama>) in French

Study abroad opportunities in French (<http://www.colorado.edu/frenchitalian/study-abroad>) and Italian (<http://www.colorado.edu/>

[frenchitalian/study-abroad](http://www.colorado.edu/frenchitalian/study-abroad)) to help students complete their international experience

Course codes for these programs are FREN and ITAL.

Study Abroad

CU-Boulder offers French study abroad programs in Annecy, Paris, Rennes, Strasbourg and Toulouse, France. In addition, students may study in Quebec, Brussels, Geneva and in the Francophone African nations of Cameroon, Madagascar, Mali and Senegal. CU-Boulder offers Italian study abroad programs in Ferrara, Florence and Perugia, Italy. Students may obtain course-credit equivalences for work done while abroad. For further information about study abroad programs, students may visit departmental advisors or the Office of International Education. Credit hours earned on this program may be applied to the Italian major. Students may also take a summer film class in Rome and/or Paris (in alternate years). This class is taught in English. The Ayer Romance Language Scholarship is available for French and Italian majors who plan to study abroad. The Il Circolo Italiano is also available for Italian majors who will be studying abroad. Both of these scholarships are awarded by the Department of French and Italian.

Students have available courses in French and Italian language, literature and culture. The department has available undergraduate programs in the following:

Bachelor's Degrees

- French - Bachelor of Arts (BA) (p. 319)
- Italian - Bachelor of Arts (BA) (p. 320)

Minors

- French - Minor (p. 320)
- Italian - Minor (p. 322)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ardizzoni, Michela (https://experts.colorado.edu/display/fisid_145152)
Assistant Professor; PhD, Indiana University Bloomington

Barchilon, Jacques
Professor Emeritus

Bloomfield, Elisabeth Marie Arnould (https://experts.colorado.edu/display/fisid_125576)
Associate Professor; PhD, University of California-San Diego

Braider, Christopher (https://experts.colorado.edu/display/fisid_100300)
Professor; PhD, Trinity College, Dublin (Ireland)

Corda, Giorgio (https://experts.colorado.edu/display/fisid_151173)
Instructor; MA, University of Venice (Italy)

Craven, Priscilla (https://experts.colorado.edu/display/fisid_108033)
Senior Instructor; MA, University of Colorado Boulder

Ferre, Valerio C (https://experts.colorado.edu/display/fisid_113064)
Professor; PhD, University of California-Berkeley

Frey, Julia B.
Professor Emeritus

Lazarino, Graziana
Professor Emeritus

Magnanini, Suzanne M. (https://experts.colorado.edu/display/fisid_118145)
Associate Professor; PhD, University of Chicago

Mayer, Edgar N.
Professor Emeritus

Mortimer, Mildred
Professor Emeritus

Motte, Warren F (https://experts.colorado.edu/display/fisid_100001)
Professor; PhD, University of Pennsylvania

Murphy, Kieran Marcellin (https://experts.colorado.edu/display/fisid_152976)
Assistant Professor; PhD, University of California-Santa Barbara

Quinn, Brian Dennis (https://experts.colorado.edu/display/fisid_155973)
Assistant Professor; PhD, University of California-Los Angeles

Seno, Cosetta (https://experts.colorado.edu/display/fisid_144515)
Associate Professor; PhD, University of California-Berkeley

Torriani, Chiara (https://experts.colorado.edu/display/fisid_132725)
Instructor

Trifunovic, Danica (https://experts.colorado.edu/display/fisid_114084)
Instructor

Van Nelson, Loredana Alina (https://experts.colorado.edu/display/fisid_142722)
Instructor

Yamashita, Masano (https://experts.colorado.edu/display/fisid_147343)
Assistant Professor; PhD, New York University

FREN 1010 (5) Beginning French 1

For students with no previous knowledge of French. Presents basic grammar and most commonly used French vocabulary. Introduces students to Francophone culture.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: French

FREN 1020 (5) Beginning French 2

Continuation of FREN 1010. Completes the presentation of most basic structures and French vocabulary.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1050

Requisites: Requires a prerequisite course of FREN 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: French

FREN 1050 (5) Beginning French Review

Covers the material of FREN 1010 and 1020 in one accelerated semester. Intended for students who know some French (i.e., four to five semesters in high school) but do not have skills adequate for 2000-level courses.

Department enforced prerequisite: 2 years of high school French.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1010 or FREN 1020

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: French

FREN 1200 (3) Medieval Epic Through Game of Thrones

Covers the most important works of medieval literature, in English translation. Among the texts studied are the Nibelungenlied, the Song of Roland, and Arthurian romances, including the stories of Lancelot and Guinevere and Tristan and Isolde. Offers a general introduction for nonmajors to medieval literature and society. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1400 (3) Medieval/Renaissance Women Writers in Italy and France

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1400

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 1500 (3) Literature and Politics in the Age of Enlightenment

Introduces political dimensions of 18th century French literature. Surveys political and social preoccupations that manifest themselves across genres (novels, scientific treatises, dialogues, erotic literature, etc.). Examines contributions made by 18th century French writers to the sociological and political imagination of Western tradition. Taught in English.

Additional Information: Departmental Category: French

FREN 1610 (3) How to Be French, 1: The Ancien Regime

Explores medieval and early modern French culture in the widest sense, encompassing masterpieces of French literature, architecture, and visual art as a key to the habits, customs, and practices of everyday life. Major themes are "living and dying," "heroes, villains, and kings," "courtliness, civility, and the art of love," and "crafty little guys."

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1620 (3) How To Be French? 2: Modernity

Introduces students to French culture in its widest sense and in particular to reflect on major social and cultural contradictions inherited from the French Revolution, which still define "Frenchness" today. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1700 (3) Francophone Literature in Translation

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and Canada. Gives special attention to oral tradition, identity, question, and cultural conflict. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Departmental Category: French

FREN 1750 (3) French Colonialism: North Africa and the Middle East

Offers a general introduction to French and Francophone literature and visual arts (painting, photography, film) from the nineteenth century to the present depicting cultures and societies of the Middle East and North Africa. In English with English translations of French texts.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 1800 (3) Contemporary French Literature in Translation

Reviews the major philosophical, political, and aesthetic issues in the 20th century French novel and drama. Beginning with existentialist literature, discussion focuses subsequently on the Theatre of the Absurd, the new novel, World War II and the Holocaust, and recent women writers. Taught in English.

Additional Information: Departmental Category: French

FREN 1850 (3) Introduction to French Society and Culture through Cinema

Introduces students to French society and culture through French cinema through films that focus thematically on major historical events (e.g., World War II; student revolts of 1968) and cultural constants of French society (e.g., feminism; colonialism and its aftermath). Taught in English.

Additional Information: Departmental Category: French

FREN 1880 (3) The Zombie in History and Popular Culture

Discusses the emergence of the zombie figure in the Caribbean and its evolution from colonial Haiti to present-day popular culture having passed through Hollywood. Through movies and literary, historical, and scientific documents, students will study critically how this mass-media icon came to represent deep-rooted anxieties about the modern world.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1900 (3) Modern Paris in Literature, Photographs, Paintings and Movies

Introduces the rise of modern Paris from the French Revolution (1789) to today. Studies the physical and sociological changes of the city in terms of architecture and industrialization through French literature, movies, paintings and photographs. Addresses problems due to the magnitude of the city, the growing fear of urban vices, and the dilemma of controlling massive urban populations. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1950 (3) French Feminisms

Introduces students to the central problematics that have defined French feminist studies. This course focuses on the various literary and historical contexts in which core concepts such as female subjectivity and agency, feminist writing and political engagement have arisen and developed in Early Modern and Modern France by looking at multiple media (literary text, film, painting). Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 2110 (3) Second-Year French Grammar Review and Reading 1

A film based curriculum will expand the knowledge of francophone culture and will continue the development of communication skills begun in the first year. This third semester course will review essential beginning grammar before introducing intermediate structures, vocabulary, and cultural/literary readings. Satisfies arts and sciences foreign language requirement.

Requisites: Requires a prerequisite course of FREN 1020 or FREN 1050 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: French

FREN 2120 (3) Second-Year French Grammar Review and Reading 2

Completes the film-based study of intermediate grammar begun in FREN 2110. Continued reading in French literature and culture, with considerable practice in writing and speaking French. Fulfills the Graduate School language requirement for the Ph.D.

Requisites: Requires a prerequisite course of FREN 2110 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 2500 (3) Conversation in French

Puts into practice all that has been learned in the first four semesters of college French. Builds conversational skills and confidence through acquisition of new vocabulary and a review of grammar essential to discussing different aspects of French culture. All work is in French.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3010 (3) French Phonetics and Pronunciation

Improves students' ability to pronounce French correctly. Coursework involves the International Phonetic Alphabet, understanding the differences between pairs of sounds, and recognizing the relationship between spelling and pronunciation. Required of all FREN majors.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3020 (3) French Phonetics Through Musical Performance

Advanced oral practice and interpretation of a French Musical. This course of applied and corrective phonetics concentrates on developing good pronunciation and fluency through song. The course culminates with a public presentation of the musical studied in class.

Requisites: Requires a prerequisite course of FREN 3010 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3050 (3) French Composition 1

French third-year level composition course. Students practice and write different forms of formal French writing. They also hone their grammar skills and analytical reading of short literature pieces. This course or FREN 3060 is required for all French majors.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3060 (3) French Composition 2

French third year level composition course. Students build on their previous knowledge of formal writing in French and more emphasis is given to argumentative and analytical style of writing. This course or FREN 3050 is required for all French majors.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3100 (3) Introduction to Critical Reading and Writing in French Literature

Study of French literature through close readings of representative examples of major literary forms (poetry, fiction, drama, essay) and through the composition of critical writings in French. Required for French majors.

Requisites: Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3110 (3) Main Currents of French Literature 1

Surveys 19th and 20th century French literature. Close reading of selected texts and the principal writers and schools. This course or FREN 3120 are required for all majors.

Requisites: Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3120 (3) Main Currents of French Literature 2

Surveys 19th and 20th century French literature. Close reading of selected texts of the principal writers and schools. This course or FREN 3110 are required for all majors.

Requisites: Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3200 (3) Introduction to Literary Theory and Advanced Critical Analysis

Introduces important aspects of both classical and modern literary theory as an aid to reading and understanding literary texts. Covers theoretical works by figures ranging from Plato and Aristotle to modern French critics such as Barthes, Foucault, and Derrida in conjunction with selected literary works. Offers students more sophisticated means of understanding issues like gender, ethnicity, the roles of both author and reader in constructing meaning, the nature and functions of signs, and the relationship between literature and the larger society. Conducted in English, though French majors are required to read the texts in the original language. Required for students taking honors in French or Italian.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 3500 (3) French Current Events: Conversation and Composition

For students who have spent fewer than four months in a French-speaking environment. Focuses on presentations, debates, discussions, readings and written work.

Requisites: Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3600 (3) Business French 1

Gives students the tools needed to function in a French-speaking work environment. A culminating project involves creating a business in a francophone country.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3700 (3) French-American Cultural Differences

Through readings, films, discussion and activities, students learn the defining values of their own country, those of France, and key differences between the two cultures. Taught in French.

Requisites: Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3800 (3) France and the Muslim World

Introduces students to the polemic colonial, social, and cultural interactions of France and Islam. Close attention will be paid to paradigms of identities of one of the major European nations and the Islamic world. Readings and discussion topics for this course cover the social, cultural, and literary depictions of Islamic and French interactions, negotiations, and contradictions. Taught in English. Cannot be used for French major or minor credit.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 4030 (3) Advanced Oral Practice and Interpreting

Concentrates on developing (or preserving) speaking fluency, correct pronunciation, and a good working vocabulary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4110 (3) French Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4120.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of FREN 3110 or FREN 3120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 4120 (3) French Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4110.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: French

FREN 4170 (3) Francophone Literature

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and French Canada. Gives special attention to oral tradition, identity question, and cultural conflict.

Requisites: Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 4250 (3) Medieval and Renaissance Readings

Explores the complex and evolving cultural and historical contexts of medieval and Renaissance French. Introduces the masterpieces of French medieval and Renaissance literature, including the Chanson de Roland and Arthurian romance. Also focuses on the work of Marie de France, Guillaume de Lorris and Jean de Meun, Christine de Pisan, Machaut, Villon, Louise Labe, and the poets of the Pleiade, Rabelais, and Montaigne.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4300 (3) Theatre and Modernity in 17th Century France

Readings of plays by Corneille, Moliere and Racine introduce students to theatre's role as a mirror of the multifarious tensions shaping modern Western experience. Taught in English with English translations.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 4330 (3) Moliere and 17th Century French Comedy

Close readings of farces and comedies of Moliere in context with selected comedies by Corneille, Rotrou and Cyrano de Bergerac and selected satires by Boileau and La Fontaine. Themes include comedy as a form of social criticism and the sociocultural significance of such episodes of Moliere's career as the scandalous quarrels of *L'ecole des Femmes* and *Tartuffe*.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4350 (3) French Enlightenment

Studies fiction, essays, theatre, and philosophical tales. Emphasizes the Enlightenment in France through the texts of its major representatives: Montesquieu, Voltaire, Marivaux, Diderot, and Rousseau.

Requisites: Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4430 (3) Survey of 19th Century French Literature

Examines fiction, poetry and theatre in 19th century France. Focuses on developing and changing literary styles and subject matter throughout the century in historical, philosophical and social context.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 4470 (3) 20th Century French Theatre and Poetry

Close readings of plays from the turn of the century to the contemporary period introduce the principal themes and techniques of modernist and postmodernist French theatre. Students are encouraged to consider problems commonly evoked by these texts and to compare the positions that each text takes on such problems as the status and uses of language, the function and limits of the theatre and the dialectic of appearance and reality.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4480 (3) 20th Century French Novel

Close readings of novels from the 1930s to the contemporary period introduce the principal themes and techniques of the modernist and postmodernist French novel. Students are encouraged to analyze a variety of questions commonly evoked in these texts, such as the problem of representation, the uses and abuses of writing, the relation of fiction and history and the status of the subject in the world.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4600 (3) Topics in French Film

Covers various topics in the French and some other Francophone cinemas (Belgian, Swiss, Quebecois) from 1895 to the present. Focuses on periods, schools, themes, and directors from Melies to Duras, and the critical approaches by which they are studied. Varies from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4700 (3) Encountering Animals: contemporary Discourse and the Dialog of Species

Explores Western philosophy and literature recent challenges to species' differences and human privileges and includes contemporary theory, novels as well as movies and other cultural artifacts. Themes include animal representations in today's culture, animal and human bond, animal welfare, post-humanism. Taught in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: French

FREN 4750 (3) Methods of Teaching French and Professional Orientation

Presents current methodology and techniques for teaching foreign language for proficiency. Areas of study include ACTFL guidelines, National Standards, assessment, classroom activities, curriculum, and syllabus design.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: French

FREN 4800 (3) Postmodernist French Novel in Translation

Focuses upon recent innovations in the French novel, and upon the postmodernist literary aesthetic. Students will examine a variety of avant-garde novels, and analyze the kinds of literary experimentation that those novels propose. They will be asked to consider a series of questions concerning the changing nature of literary representation and the status of the novel as a cultural form. Taught in English. Cannot be used for major or minor credit.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: French

FREN 4840 (1-6) Independent Study: Language

Upon consultation only and at the undergraduate level.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: French

FREN 4860 (3) War, Trauma, and Memory: Amnesias, Revisions, and Representations of Traumatic History

Attempts to investigate how extreme historical events (war, genocides, terror attacks) function as "trauma" and how these extreme events are dealt with by personal and collective memory in historical narratives, literary and cinematic fiction, and memorials. Amnesia and other types of historical negations or revisions will be analyzed, along with representations of trauma and the difficulties raised by this memorializing. Taught in English. Cannot be used for major or minor credit.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: French

FREN 4960 (6) High School French Teaching

Offered as part of the supervised student teaching in a secondary school required for state licensure to teach French. These hours do not count toward student hours in the major nor in the maximum departmental hours allowed. Pass/fail only.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: French

FREN 4980 (3) French Senior Honors Thesis

The senior honor thesis is a 40 to 45 page original research paper, written in French, and constitutes a requirement for graduating with departmental honors.

Requisites: Requires a prerequisite course of FREN 3200 (minimum grade D-).

Additional Information: Arts Sciences Honors Course
Departmental Category: French

FREN 4990 (3) Senior Seminar

Preparation of a 15-page research paper in French presented to two members of the department faculty and defended orally in class.

Recommended: Prerequisite at least one course numbered FREN 4100 or above and all third-year requirements and advisor consent.

Additional Information: Departmental Category: French

ITAL 1010 (5) Beginning Italian 1

The four skills of listening, speaking, reading, and writing are progressively developed in a predominantly oral presentation. Grammatical concepts are explained and practiced through dialogues, written exercises, and conversations. The cultural focus is on the personal world and life of students.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Italian

ITAL 1020 (5) Beginning Italian 2

Continuation of ITAL 1010, with more difficult grammatical concepts explored. The cultural focus shifts to social and civic areas.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1050

Requisites: Requires a prerequisite course of ITAL 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Italian

ITAL 1050 (5) Fast-Track Italian

Two semesters of beginning Italian in one, for students who have studied other languages or have had previous exposure to Italian.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1010 or ITAL 1020
Grading Basis: Letter Grade

Additional Information: Departmental Category: Italian

ITAL 1300 (3) La Dolce Vita: Why the Humanities Matter, Italian Style

Introduces students to a critical appraisal of the Humanities in their world. Because the Humanities were rediscovered in the late Middle Ages in Italy, the course explores the Humanities from an Italian-centered perspective, though it broadens the scope of its analysis to make this perspective relevant for students who come from a variety of cultures and backgrounds.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Italian

ITAL 1400 (3) Medieval/Renaissance Women Writers in Italy and France

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1400

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Human Diversity
Departmental Category: Italian

ITAL 1500 (3) That's Amore: Introduction to Italian Culture

Introduces students to representations of Italian society that have persisted through the ages. The course readings allow students to better understand how certain stereotypes about Italian society (e.g., Latin lover, Mafia) were born and persist in the present. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Italian

ITAL 1600 (3) Strategies of Fear: Introduction to Italian Fantastic Literature

Traces the development of the fantastic theme in Italian Literature from its origins (late nineteenth century) to contemporary times. Analyzes the modes of reception and appropriation of non-Italian gothic and fantastic narrative traditions through which Italian writers have subverted the national literary model proposed by realist narrative. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 2110 (3) Intermediate Italian Reading, Grammar, and Composition 1

Enhances the skills learned in the first-year course and develops greater fluency in understanding and speaking. More emphasis is placed on reading and writing through the use of activities featuring cultural themes that present a realistic portrait of contemporary Italy. Taught in Italian.

Requisites: Requires a prerequisite course of ITAL 1020 or ITAL 1050 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language
Departmental Category: Italian

ITAL 2120 (3) Intermediate Italian Reading, Grammar, and Composition 2

Continuation of ITAL 2110. Some reading in Italian literature and culture with considerable practice in writing and speaking Italian. Fulfills the Graduate School language requirement for the Ph.D.

Requisites: Requires a prerequisite course of ITAL 2110 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 2130 (3) Introduction to Literary Analysis

Increases student's ability to read and analyze literary texts by improving vocabulary and terminology. Students read short stories, essays, short plays, and poems to acquire critical skills and improve expression of opinions and arguments in Italian. Taught in Italian.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3015 (3) Advanced Composition 1

Teaches students to write in Italian in a variety of genres, focusing on the creative aspects of writing. Exercises and themes are drawn primarily from current events and culture (i.e., blogging, journaling, essays and films), but also allows students to develop their critical skills in other areas.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3025 (3) Advanced Composition 2: Introduction to Literary Writing

Introduces students to complex forms of writing within Italian studies. Focuses on the analysis of literary genres (e.g., autobiography, essays, short stories) through a step-by-step process that allows students to craft advanced arguments in Italian. Studies will read Italian literary texts and write and revise in workshop format (e.g., peer review, collaborative assignments).

Requisites: Requires a prerequisite course of ITAL 3015 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Italian

ITAL 3030 (3) Storia dell'arte: Advanced Composition/Conversation 3

Improves vocabulary and fluency in spoken Italian, and competence and confidence in correct and more sophisticated written Italian through the study of the history of Italian art. Exercises and themes focus on Italian Classical, Medieval, Renaissance, and Modern Art.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3040 (3) Italian Conversation Through Cinema

Taught in Italian, the course covers various topics of Italian Cinema from WWII to the present. Focus is on periods, genres, themes, and auteur/directors. Emphasis on review of language structures previously learned and acquisition of new vocabulary to enable students to discuss different aspects of Italian culture, in Italian.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3140 (3) Readings in Italian Literature-20th and 21st Century

Covers a selected reading of major texts, prose, and poetry of 20th and 21st-century literature. Emphasizes critical reading and analysis of modern and contemporary Italian literature in its literary and historical context. Taught in Italian.

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3150 (3) Readings in Italian Literature-19th Century

Introduces students to 19th century literary history through a selected reading of major texts, prose, and poetry. Emphasizes critical reading and analysis of Italian literature in its literary and historical context. Taught in Italian.

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3160 (3) Readings in Italian Literature--Medieval and Renaissance

Covers a selected reading of major texts, prose, and poetry of Medieval and Renaissance literature. Emphasizes critical reading and analysis of texts in their literary and historical context. Taught in Italian.

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4010 (3) Problems in Translation, Advanced Grammar, and Stylistics 1

Emphasizes practice in translating varying types of prose from Italian into English and English into Italian.

Requisites: Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4030 (3) Contemporary Italian Culture, Politics, and the Media

Serves as an introduction to the study of the effect that politics and the media have in shaping Italian culture. Makes use of the World Wide Web for instruction. Taught in Italian. Familiarity with Internet helpful.

Requisites: Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4040 (3) Business Italian Style

Provides an introduction to the Italian way of conducting business, with a close view on the company and its world through learning marketing and producing a real company project for the market. Analyzes topics of international marketing and trade using Italian and American economics websites. Focuses on building cross-cultural bridges between the U.S. and Italy to have smoother business relationships and enable students to participate more easily in joint international working teams.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4140 (3) The Age of Dante: Readings from The Divine Comedy

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4145 or ITAL 4147 or HUMN 4140

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4145 (3) The Age of Dante in Italian

Focuses on close readings of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in Italian.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4140 or ITAL 4147 or HUMN 4140

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4147 (3) Visualizing Dante's Inferno: A Global Seminar in Florence Italy

Focuses on close reading of Dante's *Inferno*. Examines the specific sites and art in Florence and nearby cities that Dante references in the *Inferno*, as well as visual representations of Hell created both before and after Dante's poem. Taught in English. Offered through the CU Study Abroad Program.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4140 or ITAL 4145 or HUMN 4140

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages

Studies Boccaccio's masterpiece, the *Decameron*, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4150

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4160 (3-5) Italian Literature Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Italian

ITAL 4170 (3) Italian Literature Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Italian

ITAL 4200 (3) Topics in Italian Culture and Civilization from the Origins through the Renaissance

Taught in English. Topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Italian

ITAL 4250 (3) History of Modern Italy

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4313

Additional Information: Departmental Category: Italian

ITAL 4280 (3) Topics in Italian Cinema

Examines different aspects of Italian cinema from the origins of neorealism to the present. May focus on a particular director, the culture of a specific period, or certain themes (e.g., the representation of women, the relationship between cinema and literature, or socio-aesthetic movements like Futurism or Fascism). Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Italian

ITAL 4290 (3) Italian Culture Through Cinema

Examines the representations of Italian culture through its cinema. Focusing especially on post-World War II cinema, examines how Italian filmmakers have portrayed Italian history and specific aspects of its culture (i.e., Fascism, post-war reconstruction, the Mafia, patriarchy) in the past 50 years. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Italian

ITAL 4300 (3) Multiculturalism in Italy

Focuses on multiculturalism and difference in contemporary Italian society. Readings assigned explore the experience and co-existence of ethnic and religious minorities in Italy. Students will study how specific minorities live in a major Western-European country and will investigate the connotations that the concept of 'multiculturalism' takes in the Italian context.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Italian

ITAL 4350 (3) From Wops to Dons to Movers and Shakers: The Italian-American Experience

Exposes students to the history of Italian immigration to the United States. By studying how Italians and Americans negotiated different ideas concerning identity, traditions and community, it helps students understand how Italians transformed themselves from a despised and marginalized minority into active participants in the success of the United States in the 20th and 21st centuries. Taught in English.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Italian

ITAL 4500 (4) Italian Theatre

Using theatre as a medium, this course helps students attain a higher level of proficiency in spoken and written Italian. Study of Italian theatre is integrated with acting activities and pronunciation exercises. Culminates in the production of a play. Performance is in Italian and the students participate in the writing of the script. Taught in Italian.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4600 (3) Once Upon a Time in Italy

Examines the evolution of the Italian fairy tale from the 1500s to the 2000s in literature, theater, and film. Considers the tales and their authors in their social-historical context.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4730

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Italian

ITAL 4840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Italian

ITAL 4930 (1-3) Languages Internship for Professions

Offers opportunities to use Italian skills in service to various sectors of the community, including private industry, government, and education.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4980 (3) Italian Senior Honors Thesis

The senior honors thesis is a 40 to 45 page original research paper, written in Italian, and constitutes a requirement for graduating with departmental honors.

Requisites: Requires a prerequisite course of ITAL 3015 (minimum grade C-).

Additional Information: Arts Sciences Honors Course
Departmental Category: Italian

ITAL 4990 (3) Senior Seminar

Preparation of a 15-page research paper in Italian presented to two members of the faculty and defended orally in class.

Requisites: Requires a prerequisite course of ITAL 3015 (minimum grade C-).

Additional Information: Departmental Category: Italian

French - Bachelor of Arts (BA)

Beyond providing mastery of the language skills (listening, speaking, reading, writing) of modern French needed for all purposes of daily life, the major introduces students to a central tradition of western and world culture. Since the Middle Ages, French literature, thought, taste and art have helped shape the essential experience and self-understanding of humanity at large. Survey courses and upper-division seminars offer a range of exposures to the French cultural past and the far-flung ethnic and national diversity of the French-speaking present. The major explores distinctively French contributions to world culture, such as Arthurian romance, troubadour poetry and Gothic architecture; the love sonnets of the *Pléiade*, the comic novels of Rabelais and the essays of Montaigne; the neoclassical theatre of Corneille, Molière and Racine and the critical philosophy of Descartes and Pascal; the Enlightenment philosophies of Voltaire, Diderot and Rousseau; the psychological refinements of French fiction from Mme de La Fayette to Proust; artistic revolutions like impressionism and surrealism; the renewal of artistic conventions in the Theatre of the Absurd, the New Novel and the cinema of the New Wave; the French-language literature of Africa, Canada and the Caribbean; and the vital presence of French writers in major movements of 20th century thought like existentialism, structuralism, feminism, psychoanalysis and contemporary cultural studies and multiculturalism.

The undergraduate degree in French emphasizes knowledge and awareness of:

- the fundamental outlines of the history of French literature from the Middle Ages to the present;
- significant works of French literature and the literary culture of the French-speaking world;
- the historical context in which particular works were written and the relation between literature and other forms of cultural expression (e.g., art, philosophy, politics, religion);
- contemporary French culture, politics and current events;
- a range of literary genres, their development and reception and relevant critical methodologies; and
- the grammatical structure of modern standard French.

In addition, students completing the degree in French are expected to acquire the ability and skills to:

- speak and understand modern, spoken standard French sufficient for all purposes of daily life and for intellectual discussion in academic settings;
- read and write modern standard French with sufficient fluency and correctness for successful literary or linguistic analysis of French texts;
- analyze and interpret literary texts in terms of style, plot, structure, characters, themes and the use of literary devices;
- communicate such analyses and interpretations simply in French or at a more sophisticated level in English, and discuss a wide range of topics concerning French culture, civilization and current events; and
- follow with reasonable comprehension French broadcasts or film.

Concurrent Degree Program

BA/MA in French

The department also administers a concurrent undergraduate and graduate degree program in French, offering students the opportunity to graduate with a BA and an MA in French in five years. Students interested in this program should consult a college advisor and the associate chair for graduate studies for details. Students should also read the relevant guidelines available in the main department office.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Students wishing to pursue an Honors major should also consult the Honors requirements listed below.

Note: Students undertaking a major in French should expect to have regular conferences with a college advisor to ensure that they are making adequate progress and that requirements are being met in a timely way. The department will not certify majors for graduation when a failure to satisfy requirements is the fault of the student.

A minimum of 30 upper-division credit hours in French must be completed (see below for specific courses). FREN 2120 or its equivalent is the prerequisite for admission to courses required for the major.

Required Courses and Semester Credit Hours

FREN 3010	French Phonetics and Pronunciation	3
FREN 3050	French Composition 1	3

or FREN 3060	French Composition 2	
FREN 3100	Introduction to Critical Reading and Writing in French Literature	3
FREN 3110	Main Currents of French Literature 1	3
or FREN 3120	Main Currents of French Literature 2	
Six or more other courses at the 3000 or 4000 level, of which 9 credit hours must be at the 4100 level or above (6 of which must be completed at CU)		18
FREN 4990	Senior Seminar ¹	
Total Credit Hours		30

¹ Note: The seminar runs concurrently with one of the three courses taken at the 4100 level or above. See departmental brochure for details.

Honors Requirements

Honors candidates must meet all of the regular requirements for the major plus the following:

FREN 3200	Introduction to Literary Theory and Advanced Critical Analysis	3
One semester of independent study ¹		3
Total Credit Hours		6

¹ NOTE: The semester of independent study is taken concurrently with FREN 4980, and is devoted to one-on-one work on the senior honors thesis with a faculty advisor. See department for details.

Graduating in Four Years with a BA in French

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in French, students should meet the following requirements (one option):

- **First Year - Fall semester** FREN 1010 Beginning French I (5 cr) (if needed, does not fulfill French major course requirements)
- **First Year - Spring semester** FREN 1020 Beginning French II (5 cr) (if needed, does not fulfill French major course requirements)
- **Second Year - Fall semester** FREN 2110 2nd Year French I (3 cr) (if needed, does not fulfill French major course requirements)
- **Second Year - Spring semester** FREN 2120 2nd Year French II (Prereq for courses required for French major but does not fulfill major course requirements); FREN 3010 French Phonetics and Pronunciation (3 cr), 3 cr total required.
- **Third Year - Fall semester** FREN 3050 OR FREN 3060 French Composition I or II (3 cr); Upper division (3000 level and up) course, 6 cr total required
- **Third Year - Spring semester** FREN 3100 Intro to Critical Reading and Writing in French Literature (3 cr); FREN 3110 OR FREN 3120 Main Currents in French Literature (3cr); Upper division (3000 level and up) FREN course, 9 cr. total required.
- **Fourth Year - Fall semester** FREN 4990 Senior Seminar (3cr); Upper division (3000 level and up) FREN course, 6 cr. total required.
- **Fourth Year - Spring semester** FREN course 4100 or higher (3 cr required); Upper division (3000 level and up) FREN course, 6 cr. total required.

Note: Completion of French requirements includes the successful written and oral presentation of a senior essay (FREN 4990) by the end of the fourth (senior) year.

French - Minor

We offer undergraduate courses in French language, literature and culture.

The language courses make use of CU's ALTEC language lab (<http://www.colorado.edu/frenchitalian/altec-facilities>) to provide maximum flexibility in language learning, with rich audio-visual content. Courses cover spoken and written language, composition, conversation, and Business French.

Culture courses focus on current events, differences between the US and France, and the culture of the larger Francophone world.

Literature courses cover topics ranging from the Middle Ages to the twenty-first-century novel. We also offer study abroad programs (<http://www.colorado.edu/frenchitalian/study-abroad>) in a number of French-speaking locations.

To declare a French minor, please go to www.colorado.edu/advising (<http://www.colorado.edu/advising>).

Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

All courses for minor credit hours must be taken for a grade. The only exception to this rule is course credit, which although taken for a grade, is recorded pass/fail on the student's transcript (this includes transfer credit from accredited universities and courses taken on CU study abroad programs).

Students must earn a minimum grade of C- in all courses counted for the minor.

Required Courses and Semester Credit Hours

A total of 18 upper-division credit hours is required for the minor. All courses counted for the minor must be numbered 3000 or above. Courses taught by the department in English, do not, in general, apply to the minor, with the exception of FREN 3200.

Prerequisite for admission to courses for the minor is completion of Level IV French, second-year college French (FREN 2120) or equivalent.

A maximum of 6 credit hours upper-division credit may be transferred from other universities or non-CU Boulder study abroad programs. Courses taken on CU Boulder study abroad programs are considered to be CU credit hours, and not subject to this limitation.

Italian - Bachelor of Arts (BA)

The major provides the language skills (listening, speaking, reading, writing) of modern Italian needed for all purposes of daily life. Moreover, by combining courses offered by the faculty of the Department of French and Italian with courses of Italian interest taught in other units, including film studies, fine arts and history, the program promotes an understanding of the role of the Italian literary and cultural tradition within western civilization at large. As the birthplace of Dante, Petrarca, Boccaccio, Ariosto, Tasso, Marino, Michelangelo, Raphael and Da Vinci,

Italy is the cradle of the Renaissance. Italy projects a powerful, formative influence into our own day through the work of 19th and 20th century writers like Leopardi, Manzoni, Pirandello, Levi and Calvino; operatic composers like Rossini, Puccini and Verdi; philosophers and critics like Croce, d'Annunzio, Gramsci and Ginzburg; and filmmakers like Fellini, Pasolini and Bertolucci. Thus, in addition to supplying the necessary background for advanced professional study and specialization, the Italian major introduces students to a rich literary, artistic and intellectual history at the roots of the modern world.

Students wishing to major in Italian are required to have a thorough advising session with the Italian program advisor. In this session the student program of study is outlined in detail. Students are required to see the advisor in the event that any of their major courses are canceled so that substitutions and revisions in their programs can be made. The department will not approve a major in Italian unless the student has been advised by the program advisor.

For courses in other departments with an Italian emphasis (e.g., comparative literature, fine arts, history, honors, etc.), see those sections.

The undergraduate degree in Italian emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Italian literature from the Middle Ages to the present;
- significant works of Italian literature and the contribution to world literature of Italian letters;
- the historical context in which particular works were written;
- contemporary Italian culture, politics and current events;
- a range of literary genres, their development and reception and relevant critical methodologies; and
- the grammatical structure of modern standard Italian.

In addition, students completing the degree in Italian are expected to acquire the ability and skills to:

- speak and understand modern, spoken, standard Italian sufficient for all purposes of daily life and for intellectual discussion in academic settings;
- read and write modern standard Italian with sufficient fluency and correctness for successful literary or linguistic analysis of Italian texts;
- analyze and interpret literary texts in terms of style, plot structure, characters, themes and the use of literary devices;
- communicate such analyses and interpretations simply in Italian or at a more sophisticated level in English, and discuss a wide range of topics concerning Italian culture, civilization, and current events; and
- follow with reasonable comprehension authentic Italian broadcasts or film.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Thirty-six credit hours beyond the first year with a 2.00 (C) grade point average or better are required, as listed below.

Required Courses and Semester Credit Hours

Italian Lower-Division

ITAL 2110	Intermediate Italian Reading, Grammar, and Composition 1	3
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ITAL 2120	Intermediate Italian Reading, Grammar, and Composition 2	3
ITAL 2130	Introduction to Literary Analysis	3

Italian 3000-Level

ITAL 3015	Advanced Composition 1	3
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Select one of the following: 3

ITAL 3025	Advanced Composition 2: Introduction to Literary Writing	
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ITAL 3030	Storia dell'arte: Advanced Composition/Conversation 3	
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ITAL 3040	Italian Conversation Through Cinema	
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Select two of the following (prereq. ITAL 2130): 6

ITAL 3140	Readings in Italian Literature-20th and 21st Century	
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ITAL 3150	Readings in Italian Literature-19th Century	
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ITAL 3160	Readings in Italian Literature—Medieval and Renaissance	
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Italian 4000-Level

Students must take at least three 4000-level courses in the Italian department, of which one will be: 9

ITAL 4990	Senior Seminar ¹	
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Upper-Division Electives

Electives may be chosen from courses outside the Department of French and Italian, the content of which is consistent with the goals of the Italian major, and always in consultation with the major advisor. It is recommended that students select courses in diverse disciplines and time periods. 6

Total Credit Hours 36

¹ Before registering for ITAL 4990, students must meet with the Italian advisor.

Honors Requirements

Honors candidates must meet all of the regular requirements for the major plus the following:

FREN 3200	Introduction to Literary Theory and Advanced Critical Analysis ¹	3
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One semester of independent study or research

ITAL 4840	Independent Study	3
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Total Credit Hours 6

¹ NOTE: FREN 3200 is taught in English and presupposes no knowledge of French.

Graduating in Four Years with a BA in Italian

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Italian, students should meet the following requirements:

- **First Year Fall semester** - ITAL 1010 (5 cr) Beginning Italian I (if needed, does not fulfill Italian major course requirements)

- **First Year Spring semester** - ITAL 1020 (5 cr) Beginning Italian II (if needed, does not fulfill Italian major course requirements); OR begin with ITAL 1050* (5 cr) Fast Track Italian
- **Second Year Fall semester** - ITAL 2110 (3 cr) Intermediate Italian I, total 3 cr.
- **Second Year Spring semester** - ITAL 2120 (3 cr) Intermediate Italian II; ITAL 2130 (3 cr) Introduction to Literary Analysis (ITAL 2120 and ITAL 2130 MAY be taken concurrently), total 6 cr.
- **Third Year Fall semester** - ITAL 3015** (3 cr) Advanced Composition I; plus ITAL 3140 (3 cr) Readings in Italian Literature - 20th and 21st c., OR ITAL 3150 (3 cr) Readings in Italian Literature - 19th c., OR ITAL 3160 (3 cr) Readings in Italian Literature - Medieval/Renaissance, total 6 cr.
- **Third Year Spring semester** - ITAL 3025 (3 cr) Advanced Composition II, OR ITAL 3030 (3 cr) Storia dell'arte, OR ITAL 3040 (3 cr) Italian Conversation through Cinema; plus ITAL 3140 (3 cr) OR ITAL 3150 (3 cr), OR ITAL 3160 (3 cr), total 6 cr.
- **Fourth Year Fall semester** - Two ITAL 4000 level courses, one of which must be ITAL 4990; and 1 upper division elective, total 9 cr.
- **Fourth Year Spring semester** - Remaining ITAL 4000 level course, and 1 upper division elective, total 6 cr.

*Credit not granted for this course AND ITAL 1010 and ITAL 1020.

**ITAL 3025 requires the prereq of ITAL 3015.

Italian - Minor

A minor program is offered in Italian. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

- All courses must carry an ITAL Subject Code.
- Students may apply credit hours to the Italian minor which are earned through a CU Boulder Study Abroad program in Italy. Specific course equivalencies must be determined by the Italian advisor.
- Students may apply a maximum of 9 transfer credit hours to the Italian minor, and a maximum of 6 credit hours at the upper-division level. Specific course equivalencies must be determined by the Italian advisor.
- Students may apply a maximum of 3 credit hours from Italian courses taught in English.
- Students must consult with the Italian advisor during each registration period and before a study abroad program.
- Students must maintain an overall and Italian grade point average of 2.000 (C). They must earn a grade of C- or higher in ALL courses required for the Italian minor and may not take minor requirement courses pass/fail.

To declare an Italian minor, go to www.colorado.edu/advising (<http://www.colorado.edu/advising>) and make an appointment with the Italian advisor.

Required Courses and Credit Hours

A total of 18 credit hours beyond the first year level is to be earned for the minor, as follows:

Lower-division

ITAL 2110	Intermediate Italian Reading, Grammar, and Composition 1	3
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ITAL 2120	Intermediate Italian Reading, Grammar, and Composition 2 ¹	3
ITAL 2130	Introduction to Literary Analysis ¹	3

Upper-Division

Select one of the following (prereq. of ITAL 2130 must be met):

ITAL 3015	Advanced Composition 1	3
or ITAL 3030	Storia dell'arte: Advanced Composition/Conversation 3	
or ITAL 3040	Italian Conversation Through Cinema	

Select one of the following (prereq ITAL 2120 must be met)

ITAL 3140	Readings in Italian Literature-20th and 21st Century	3
or ITAL 3150	Readings in Italian Literature-19th Century	
or ITAL 3160	Readings in Italian Literature-Medieval and Renaissance	

Italian upper-division elective		3
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Total Credit Hours		18
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¹ ITAL 2120 and ITAL 2130 may be taken concurrently; see Italian advisor.

Geography

The Geography Department offers theoretical and applied work in human geography, environment and society geography, physical geography, and geographic information science. Each subfield covers a broad range of topics. Human geography includes political, cultural, development, feminist, population and urban geography. Environment and society geography includes political ecology, natural hazards and conservation practice. Physical geography includes climatology, geomorphology, hydrology and biogeography. Geographic information science includes spatial analysis using GIS, remote sensing and cartography. The Department also offers regionally focused courses on mountain geography and geographies of China, Latin America, Africa and South Asia. To complement its curriculum, the department also offers internship opportunities for geography majors.

The undergraduate degree in geography emphasizes knowledge and awareness of:

- the unique contributions of the discipline to understanding the spatial components of problems and the diverse factors relating to human interaction with the environment;
- the spatial distributions of physical and human characteristics on the Earth surface, the general patterns these form and the processes that have created and are changing these patterns;
- major themes of geographical analysis, including human and physical characteristics of place; human-environmental relations; movement of people, ideas and products; and regionalization; and
- the general geographical principles of human-environment interaction, global change and human spatial organization.

In addition, students completing the degree in geography are expected to acquire proficiency in:

- one or more of the specific geographic skill areas of cartography, remote sensing and geographic information systems;
- writing, quantitative methods, computer literacy, and library and field methods of data collection; and

- identifying the geographic dimensions of a problem and analyzing, synthesizing and evaluating relevant data and applying geographic principles offering a geographic perspective on that problem.

The course code for this program is GEOG.

Minimum Academic Preparation Standards (MAPS)

To fulfill a MAPS deficiency in geography, students may take one of the following courses: GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992 or pass the Geography Exemption Exam. Declared majors or minors with junior standing (57 credit hours minimum) or transfers with junior standing may take GEOG 3682, GEOG 3742 or GEOG 4712 to fulfill the MAPS deficiency.

For more information on the exemption exam, contact Testing Services at 303-492-5854 or www.colorado.edu/career/testing-services (<http://www.colorado.edu/career/testing-services>).

Geography Honors Program

Students interested in earning honors with their work in geography should contact the departmental honors advisor during their junior year.

Geography Internship Program

To complement its curriculum, the department offers geography majors internship opportunities that can be used to earn credit towards their degree. Students interested in pursuing an internship should contact the Department for information on eligibility and terms.

Residential Academic Program

Geography students specializing in environmental issues may want to contact the Baker Residential Academic Program. Students may visit the Geography Department office or refer to the Residential Academic Programs (catalog.colorado.edu/undergraduate/colleges-schools/academic-enrichment-programs/raps) section.

Bachelor's Degree

- Geography - Bachelor of Arts (BA) (p. 330)

Minor

- Geography - Minor (p. 333)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abdalati, Waleed (https://experts.colorado.edu/display/fisid_145800)
Professor; PhD, University of Colorado Boulder

Anderson, Suzanne Prestrud (https://experts.colorado.edu/display/fisid_131099)
Professor; PhD, University of California-Berkeley

Balch, Jennifer Kakareka (https://experts.colorado.edu/display/fisid_154464)
Assistant Professor; PhD, Yale University

Barnard, Holly Rene (https://experts.colorado.edu/display/fisid_147417)
Assistant Professor; PhD, Oregon State University

Barry, Roger G.
Professor Emeritus

Blanken, Peter David (https://experts.colorado.edu/display/fisid_114026)
Professor; PhD, Univ of British Columbia (Canada)

Bryan, Joseph Henry (https://experts.colorado.edu/display/fisid_145802)
Associate Professor; PhD, University of California-Berkeley

Buttenfield, Barbara P (https://experts.colorado.edu/display/fisid_107860)
Professor; PhD, University of Washington

Caine, T. Nelson
Professor Emeritus

Erickson, Kenneth A.
Professor Emeritus

Farmer, Carson J.Q. (https://experts.colorado.edu/display/fisid_156292)
Assistant Professor; PhD, National University of Ireland (Ireland)

Fluri, Jennifer L (https://experts.colorado.edu/display/fisid_154033)
Associate Professor; PhD, Pennsylvania State University

Foote, Kenneth E.
Professor Emeritus

Goldman, Mara Jill (https://experts.colorado.edu/display/fisid_143542)
Associate Professor; PhD, University of Wisconsin-Madison

Jan, Najeeb A (https://experts.colorado.edu/display/fisid_143581)
Assistant Professor; PhD, University of Michigan Ann Arbor

Kittel, Timothy (https://experts.colorado.edu/display/fisid_139473)
Lecturer

Leyk, Stefan (https://experts.colorado.edu/display/fisid_145192)
Associate Professor; PhD, Univ of Zurich (Switzerland)

Molotch, Noah Paul (https://experts.colorado.edu/display/fisid_139374)
Associate Professor; PhD, University of Arizona

O'Loughlin, John (https://experts.colorado.edu/display/fisid_101339)
Professor; PhD, Pennsylvania State University

Oakes, Timothy S. (https://experts.colorado.edu/display/fisid_109269)
Professor; PhD, University of Washington

Pitlick, John (https://experts.colorado.edu/display/fisid_105951)
Professor; PhD, Colorado State University

Riosmena, Fernando (https://experts.colorado.edu/display/fisid_144419)
Associate Professor; PhD, University of Pennsylvania

Rogers, Andrei
Professor Emeritus

Serreze, Mark (https://experts.colorado.edu/display/fisid_106334)
Professor; PhD, University of Colorado Boulder

Spielman, Seth Edward (https://experts.colorado.edu/display/fisid_148271)
Associate Professor; PhD, SUNY at Buffalo

Steffen, Konrad
Professor Emeritus

Travis, William R (https://experts.colorado.edu/display/fisid_101777)
Associate Professor; PhD, Clark University

Veblen, Thomas T (https://experts.colorado.edu/display/fisid_105842)
Professor; PhD, University of California-Berkeley

Williams, Mark W (https://experts.colorado.edu/display/fisid_105438)
Professor; PhD, University of California-Santa Barbara

Yeh, Emily Ting (https://experts.colorado.edu/display/fisid_130119)
Professor; PhD, University of California-Berkeley

GEOG 1001 (4) Environmental Systems: Climate and Vegetation

Lect. and lab. Introduces the atmospheric environment of the Earth: elements and controls of climate and their implications for hydrology, vegetation, and soils. Emphasizes distribution of physical features across the Earth's surface and interactions between humans and their environment, especially those leading to global change on the decade to century time scale.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science

MAPS Course: Natural Science Lab or Lab/Lec

GEOG 1011 (4) Environmental Systems: Landscapes and Water

Lect. and lab. Introduces landscapes and flowing water, emphasizing the formation and geographic distribution of mountains, volcanoes, valleys, and deserts, and their shaping by rivers and glaciers. Includes field trips.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science

MAPS Course: Natural Science Lab or Lab/Lec

GEOG 1962 (3) Geographies of Global Change

Familiarizes students with a geographic understanding of conflicts around the globe and of economic, political and cultural globalization. Analyzes the relationship between global forces, regions and local interests in contemporary territorial and geopolitical tensions and conflicts, emphasizing issues such as nationalism, migration, labor and natural resources. Formerly GEOG 2002.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

MAPS Course: Geography

GEOG 1972 (3) Environment-Society Geography

Examines interactions between humans and the environment across the globe from a geographical perspective. Introduces different analytical perspectives through which to understand nature-society relationships, with a focus on social, cultural and political-economic dimensions, and examples from different natural resource sectors (e.g., water, agriculture) and countries. Formerly GEOG 2412.

Additional Information: Departmental Category: Human and Cultural Geography

MAPS Course: Geography

GEOG 1982 (3) World Regional Geography

Introduces a comparative framework for recognizing and understanding world regions. Units combine historical understanding with discussion of problems and challenges that face them, including discussion of economic growth, inequality, political conflict, colonialism, race and climate change.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

MAPS Course: Geography

GEOG 1992 (3) Human Geographies

Examines social, political, economic, and cultural processes creating the geographical worlds in which we live, and how these spatial relationships shape our everyday lives. Studies urban growth, geopolitics, agricultural development and change, economic growth and decline, population dynamics, and migration exploring both how these processes work at global scale as well as shape geographies of particular places.

Additional Information: Departmental Category: Human and Cultural Geography

MAPS Course: Geography

GEOG 2053 (3) Mapping a Changing World

Examines roles that maps, geospatial data and technology play in understanding and explaining our world. Topics introduce map reading, GPS, drones, web mapping and spatial data in social networks. Class discussions and assignments include critical thinking about maps as propaganda and as tools of social and political power. Hands-on exercises demonstrate skills for map exploration of natural and societal worlds.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 2271 (3) Introduction to the Arctic Environment

Rising temperatures and shrinking sea ice are only the most visible indications of a rapidly changing Arctic. This course addresses the climate of the Arctic and the changes being observed at a non-mathematical level. It is intended to provide students with a basic understanding of the Arctic physical environment.

Additional Information: Departmental Category: Physical Geography

GEOG 2852 (3) Contemporary Southeast Asia: Environmental Politics

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

Equivalent - Duplicate Degree Credit Not Granted: ASIA 2852

Grading Basis: Letter Grade

GEOG 3022 (3) Climate Politics and Policy

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3022

Recommended: Prerequisite ENVS 1000 or GEOG 1972.

GEOG 3023 (4) Statistics for Geography

Introduces parametric and distribution-free statistics, emphasizing applications to earth science problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3023

Additional Information: Departmental Category: Techniques (Skills)

GEOG 3053 (4) Cartography: Visualization and Information Design

Introduction to the fundamentals of cartography, the science and art of map design. Emphasis on map projections, symbolization and the design of maps with computers. Students produce series of thematic maps with modern computer-assisted techniques.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite basic familiarity with computers and an introductory course in statistics (may be taken concurrently).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 3251 (3) Mountain Geography

Surveys mountain environments and their human use with illustrations from temperate and tropical mountain areas.

Additional Information: Departmental Category: Physical Geography

GEOG 3301 (3) Analysis of Climate and Weather Observations

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3300

Requisites: Requires prerequisite courses of APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 and ATOC 1050 and ATOC 1060 or GEOG 3601 or ATOC 3600 or ENV 3600 or GEOG 1011 (all minimum grade D-).

Recommended: Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENV 3600 or GEOG 1001 and one semester calculus.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 3351 (3) Biogeography

Surveys and analyzes plant and animal distributions on a world scale from ecological and historical perspectives. Emphasizes human impact on species.

Requisites: Requires prerequisite course of GEOG 1001 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 3402 (3) Natural Hazards

Explores the impacts of extreme geophysical events on human society. Emphasizes adaptations to extreme events and ways of reducing vulnerability and damage.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3412 (3) Conservation Practice and Resource Management

Studies policy and management of natural resources. Emphasizes practical approaches to the conservation and management of soil, land, water and air resources.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3422 (3) Political Ecology

Introduces students to political ecology, an influential approach to understanding society-environment relationships. Explores issues including different philosophies of nature and wilderness, the politics of conservation, causes of environmental degradation, environmental conflict and indigenous ecological knowledge.

Recommended: Prerequisite GEOG 1972.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3511 (4) Introduction to Hydrology

Examines hydrologic processes in the surface environment, emphasizing the environment of the western United States. Emphasizes natural processes and their management to augment water resources.

Requisites: Requires a prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 3601 (3) Principles of Climate

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3600 and ENV 3600

Requisites: Restricted to Geography (GEOG) or Environmental Studies (ENV 3600) majors or Atmospheric Oceanic Sciences (ATOC) minors only.

Recommended: Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 3612 (3) Geography of American Cities

Introduces geography of American cities. Includes demographic and ideological contexts of urban development, emergence of the city system, location theory and rent models, and urban-economic problems.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3662 (3) Economic Geography

Presents theories of the spatial organization of economic production, consumption and exchange systems. Geographical dynamics of industrialization, urbanization and economic growth. Examination of property, labor and social conflict, with a focus on political economy.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3672 (3) Gender and the Global Economy

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation, and women's social movements worldwide.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3672

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Human and Cultural Geography

GEOG 3682 (3) Geography of International Development

Compares and contrasts global characteristics and processes of development, emphasizing the developing countries of the world. Integrates theories of development, specific development topics, and case studies to explore the problems of development.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 3692 (3) Introduction to Global Public Health

Introduces global health by putting its contemporary definition, determinants, development and direction as a field into a broad global context. The course is divided into four core topics: 1) the burden and distribution of disease and mortality; 2) the determinants of global health disparities; 3) the development of global health policies; and 4) the outcomes of global health interventions. Required for the Public Health Certificate.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3742 (3) Place, Power, and Contemporary Culture

Presents a radical reexamination of the geography of culture. Examines the relationship between places, power, and the dynamics of culture. Explores how the globalization of economics, politics, and culture shapes local cultural change. Looks at how place-based cultural politics both assist and resist processes of globalization.

Recommended: Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Human and Cultural Geography

GEOG 3812 (3) Mexico, Central America, and the Caribbean

Introduces the geography of Latin America, focusing on the lands and peoples of Mexico, Central America, and the Caribbean. Examines regional and national culture, history, environment, and population, as well as ongoing environmental and socioeconomic changes.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3822 (3) Geography of China

Surveys the world's most populous country, examining physical and historical geography, urbanization and regional development, agriculture, population, energy, and the environment. Seeks to situate China's development in a broader Asian and global context.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 3832 (3) Geographies of South Asia

Examine the geographies of South Asia through four interrelated themes: Territory, Trade, Transportation, and Tributaries. Learn about territory including physical features, political conflicts and changing borders. Explore trade, transportation routes, and tributaries to understand economic, social/cultural and political geographies. Investigate culture and society through analyses of gender roles/relations.

Recommended: Prerequisites GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 3840 (1-6) Undergraduate Independent Study

Provides an independent study opportunity, by special arrangement with faculty, for students presenting strong geography preparation. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Geography (GEOG) majors only.

GEOG 3842 (3) Human Geography of Czechia: Political, Economic and Social Transitions

Excursions in Prague will begin with an understanding of Czech history through various imprints on the landscape, such as city planning, design, architecture and culture. This will be followed by a discussion of Prague in the 20th century and the various political, economic and social transitions. These transitions will be explored through field based study in and outside of Prague.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3862 (3) Geography of Africa

Studies physical and cultural regions of Africa. Analyzes and compares the development of present nation-states and contemporary geographic issues including globalization, conservation, public health and food security.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3882 (3) Geography of the Former Soviet Union

Examines the contemporary social, political, population, cultural, ethnic and resource geography of the former Soviet Union. Relations between Russia and neighboring countries are also considered. Historical and physical geography are introduced as background to understanding post-Soviet developments and challenges.

Grading Basis: Letter Grade

GEOG 3930 (3) Internship

Provides an academically supervised opportunity for advanced geography or environmental studies majors to work in public and private organizations on projects related to the student's career goals and to relate classroom theory to practice. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors only.

GEOG 4023 (4) Introduction to Quantitative Methods in Human Geography

Introduces fundamental statistical and quantitative modeling techniques widely used in geography today. Emphasizes geographic examples and spatial problems, as are statistical routines now available on most computers.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5023

Requisites: Requires prerequisite course of GEOG 3023 (minimum grade D-).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4043 (4) Cartography 2: Interactive and Multimedia Mapping

An advanced course in interactive, multimedia, animated and Web-based cartography stressing the important role digital cartography plays in cyberspace. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5043

Requisites: Requires prerequisite course of GEOG 3053 (minimum grade C-).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5093 and GEOL 4093 and GEOL 5093

Requisites: Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4100 (1-3) Special Topics in Geography

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4110 and GEOG 4120.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

GEOG 4103 (4) Introduction to Geographic Information Science

Examines construction and use of an information system and its data specifically designed for representing and manipulating geographical data. Emphasizes modern geographical information systems including computer hardware/software with a collection of methods/procedures for recording, transforming, storing/retrieving, analyzing, and mapping geographic data.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5103

Requisites: Requires prereq crs of GEOG3053 ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or MATH2510 or PSCI2075 or PSYC2111 or SOCY2061 or 4061 (all min grade C-).

Restricted to students with 57-180 credits (JR/SR) ENVS or GEOG mjrs only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4110 (1-4) Special Topics in Geography

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4120.

Repeatable: Repeatable for up to 8.00 total credit hours.

GEOG 4120 (1-3) Special Topics in Geography

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4110.

Repeatable: Repeatable for up to 6.00 total credit hours.

GEOG 4173 (3) Research Seminar

Examines the nature of research and develops pregraduate skills for geographic research, emphasizing problem definition, methods, sources, data interpretation, and writing. Recommended for students pursuing honors.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Geography (GEOG) or Environmental Studies (ENVS) majors only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4201 (3) Biometeorology

Interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans).

Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4201

Requisites: Requires prereq of GEOG 1001 any of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (min grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4203 (4) Geographic Information Science: Modeling Applications

Extends basic GIS concepts and mechanics. Develop GIS models for human and environmental applications. Grid and vector data models, tessellated and hierarchical data structures, terrain representation, interpolation and kriging, spatial regression. Small group projects design, implement and run GIS models.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5203

Requisites: Requires prerequisite course of GEOG 4103 (minimum grade C-).

Recommended: Requisite working knowledge of GIS software.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4241 (4) Principles of Geomorphology

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4241

Requisites: Requires prereq crs GEOG 1011 or GEOL 1010 or 1020 or 1030 or 1040 or 1060 and APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or 1300 or 1310 (min grade D-). Restricted to students with 57-180 credits (Jr/Sr) EVOC, GEOG, GEOL, ENVS mjrs only

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence Departmental Category: Physical Geography

GEOG 4251 (4) Fluvial Geomorphology

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5251

Requisites: Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

Recommended: Prerequisite GEOG 3023.

Additional Information: Departmental Category: Physical Geography

GEOG 4261 (3) Glaciers and Permafrost

Surveys the major terrestrial components of the cryosphere, including permafrost, glaciers and ice sheets. Emphasizes physical processes involving ice, including thermal behavior, ice deformation and mass balance, but also considers biogeochemical processes and landforms associated with ice. The climate context, including human interactions and recent climate history, will be considered. Taught in a combination lecture-seminar format.

Requisites: Requires prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

Recommended: Prerequisite GEOG 4241.

Additional Information: Departmental Category: Physical Geography

GEOG 4271 (3) The Arctic Climate System

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5271

Requisites: Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

Recommended: Prerequisites GEOG 3511 or GEOG 3601 or ATOC 3600 or ENVS 3600 and statistics.

Additional Information: Departmental Category: Physical Geography

GEOG 4292 (3) Migration, Immigrant Adaptation, and Development

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5292 and ECON 4292

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4303 (4) GIS Programming for Spatial Analysis

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data. Covers concepts, principles and techniques of programming and solving spatial problems in physical and human geography.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5303

Requisites: Requires prerequisite course of GEOG 4103 (minimum grade C-).

Recommended: Prerequisite GEOG 4203.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4311 (3) Watershed Biogeochemistry

Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling.

Requisites: Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

Recommended: Requisite parametric statistics.

Additional Information: Departmental Category: Physical Geography

GEOG 4321 (3-4) Snow Hydrology

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5321

Requisites: Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4331 (3-4) Mountain Climatology

Surveys and analyzes climatic characteristics of mountain environments worldwide.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5331

Requisites: Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4371 (3) Forest Geography: Principles and Dynamics

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5371

Requisites: Requires prerequisite course of GEOG 1001 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4401 (3) Soils Geography

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5401

Requisites: Requires prerequisite course of GEOG 1011 (minimum grade D-).

Recommended: Prerequisite inorganic chemistry.

Additional Information: Departmental Category: Physical Geography

GEOG 4403 (3) Space Time Analytics

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands on, flipped classroom approach with in-class development of technical skills.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5403

Requisites: Requires a prerequisite course of GEOG 3023 or GEOG 4023 (minimum grade C-).

GEOG 4430 (3) Seminar: Conservation Trends

Provides environmental studies or geography majors with an undergraduate format for interdisciplinary discussion and research into current and future directions of conservation.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOG 4463 (3) Earth Analytics Data Science Bootcamp

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5463

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

GEOG 4501 (3) Water Resources and Water Management of Western United States

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5501

Additional Information: Departmental Category: Physical Geography

GEOG 4503 (3) GIS and Geospatial Project Management

Managing a geospatial project encompasses problem design, analysis and team dynamics. The class mixes lectures and class exercises with student-selected projects. Lectures run concurrent with projects, working through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5503

Requisites: Requires prerequisite course of GEOG 3053 or GEOG 4103 (minimum grade C-).

GEOG 4563 (3) Earth Analytics

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5563

Requisites: Requires prereq course of APPM 1340 and 1345 or one of following: GEOG 4023, 4103, 3023, APPM 1350, 4570, ECON 1088, 3818, MATH 1081, 1300, 1310, 2510, 3510, ANTH 4000, BCOR 1020, GEOL 3023, PSCI 2075, PSYC 2111, SOCY 2061 or EBIO 4410 (min grade C).

Grading Basis: Letter Grade

GEOG 4603 (3) GIS in the Social and Natural Sciences

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5603

GEOG 4622 (3) City Life

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5622

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4632 (3) Development Geography

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5632

Requisites: Requires prerequisite course of GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 (minimum grade D-).

Recommended: Prerequisite GEOG 3682.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4712 (3) Political Geography

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5712

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or IAFS 1000 or PSCI 2012 or PSCI 2223.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4722 (3) Field Methods in Human Geography

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5722

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4732 (3) Population Geography

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5732

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4742 (3) Topics in Environment and Society

Studies peoples and their environments, including human modification of nature and cultural interpretation and construction of rural and urban landscapes.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4762 (3) Geographies of Political Islam: Empire, Terror and Revolution

Explores the postcolonial landscape of political Islam through the lens of political and cultural geography. Develops a critical anti-essentialist framework for understanding the political crisis of the Muslim world in relation to broader questions of empire, nationalism, democracy, revolution, security, terrorism, globalization and modernity. Focuses on the post-1979 period, several key Muslim nation-states (Saudi-Arabia, Egypt, Iran, Turkey, Pakistan) and movements (Taliban, ISIS).

Recommended: Prerequisite GEOG 1982 or GEOG 1992 or GEOG 3742.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4812 (3) Environment and Development in South America

Presents theoretical approaches to the links between environment and development in Latin America and focuses on analytical discussion of contemporary (and controversial) issues in sustainable development in South America. Examines social, ecological, economic, and political forces influencing the use of natural resources.

Recommended: Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 3812 or GEOG 3422 or ANTH 3110 or PSCI 3032.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4822 (3) Environment and Development in China

Examines key environmental problems in relation to China's rapid modernization and development.

Recommended: Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or HIST 1618.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 4832 (3) Geography of Tibet

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5832

Recommended: Prerequisite GEOG 3822 or other classes on China.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 4852 (3) Health and Medical Geography

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5852

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites GEOG 1001 or GEOG 1011 and GEOG 1962 or GEOG 1972 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4892 (3) Geography of Western Europe

Provides a regional survey of cultural, political, economic, social, and physical geography of Western Europe, emphasizing the distinctive character and problems of each major area and the relationship of the region to the world.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4990 (3) Senior Thesis

Offers thesis research under faculty supervision. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Geography (GEOG) majors only.

Geography - Bachelor of Arts (BA)

The Department of Geography offers a bachelor of arts (BA) degree in geography. The geography BA emphasizes knowledge and awareness of:

- the unique contributions of the discipline to understanding the spatial components of problems and the diverse factors relating to human interaction with the environment;
- the spatial distributions of physical and human characteristics on the Earth surface, the general patterns these form, and the processes that have created and are changing these patterns;
- the major themes of geographical analysis, including absolute and relative location; human and physical characteristics of place; human and environmental relations; movement of people, ideas, and products; and regionalization; and
- the general geographical principles of human-environment interaction, global change, and human spatial organization.

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in Geography, in addition to completing all the current requirements for the BA with a major in Geography at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses below.

In addition to a standard degree in Geography, the Department offers transcribed concentrations in Geographic Information Science, Human Geography, Environment-Society Geography and Physical Geography. Coursework required for each concentration is listed below.

Students must complete at least 37 and no more than 45 credit hours in Geography with grades of C- or better (23 credit hours must be upper-division). No pass/fail grades are allowed in the major. Transfer students majoring in Geography must complete at least 12 credit hours of upper-division geography courses at CU Boulder. No course may be used to fulfill more than one requirement for the major.

All courses that can be used to meet College of Arts and Sciences core curriculum requirements are indicated with a footnote.

Required Courses and Credit Hours (all concentrations)

Certain course selections are better preparation for certain concentrations.

GEOG 1001	Environmental Systems: Climate and Vegetation ¹	4
GEOG 1011	Environmental Systems: Landscapes and Water ¹	4
GEOG 3023	Statistics for Geography	4
Select one of the following human geography courses:		3
GEOG 1962	Geographies of Global Change	
GEOG 1972	Environment-Society Geography	
GEOG 1982	World Regional Geography	
GEOG 1992	Human Geographies	
Select one of the following mapping courses:		3-4
GEOG 2053	Mapping a Changing World	
or GEOG 305 Cartography: Visualization and Information Design		
Select at least one of the following methods courses:		3-4
GEOG 4023	Introduction to Quantitative Methods in Human Geography	
GEOG 4043	Cartography 2: Interactive and Multimedia Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4103	Introduction to Geographic Information Science	
GEOG 4173	Research Seminar	
GEOG 4722	Field Methods in Human Geography	
Total Credit Hours		21-23

¹ Core curriculum course.

General Geography Concentration

In addition to the courses required of all concentrations complete the following:

Select at least one of the following:		3-4
GEOG 3351	Biogeography	
GEOG 3402	Natural Hazards	
GEOG 3422	Political Ecology	
GEOG 3511	Introduction to Hydrology	
GEOG 3601	Principles of Climate	
GEOG 3672	Gender and the Global Economy ¹	
GEOG 3682	Geography of International Development	
GEOG 3692	Introduction to Global Public Health	
GEOG 3742	Place, Power, and Contemporary Culture	
Take upper division electives within Geography to reach 23 upper division credit hours in the major.		10-13
Total Credit Hours		13-17

Human Geography Concentration

In addition to the courses required of all concentrations complete the following:

GEOG 3742	Place, Power, and Contemporary Culture	3
or GEOG 3682 Geography of International Development		
A third-year university-level proficiency in a foreign language appropriate to the geographic concentration is required. ¹		
Select three of the following electives: ²		9

GEOG 3422	Political Ecology	
GEOG 3672	Gender and the Global Economy ³	
GEOG 3682	Geography of International Development	
GEOG 3692	Introduction to Global Public Health	
GEOG 3742	Place, Power, and Contemporary Culture	
GEOG 3812	Mexico, Central America, and the Caribbean	
GEOG 3822	Geography of China ³	
GEOG 3832	Geographies of South Asia ³	
GEOG 3862	Geography of Africa	
GEOG 4173	Research Seminar	
GEOG 4292	Migration, Immigrant Adaptation, and Development	
GEOG 4622	City Life	
GEOG 4632	Development Geography	
GEOG 4712	Political Geography	
GEOG 4852	Health and Medical Geography	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	

Take one upper division elective in Geographic Information Science, Environment and Society, or Physical Geography. 3-4

Total Credit Hours 15-16

¹ This requirement may be met by completion of one or two semester-long, third year, university-level grammar courses (depending on the language) with a grade of C- or better, while also satisfying language department requirements for advancement through the sequence.

² Unless noted, Department enforced prereq. for all courses is GEOG 1962, GEOG 1972, GEOG 1982, or GEOG 1992.

³ Core curriculum course.

Environment and Society Geography Concentration

In addition to the courses required of all concentrations complete the following:

GEOG 3402	Natural Hazards	3
or GEOG 3422 Political Ecology		
ENVS 2000	Applied Ecology for Environmental Studies	4
Select three of the following electives: ¹		9
GEOG 3402	Natural Hazards	
GEOG 3422	Political Ecology	
GEOG 3682	Geography of International Development	
GEOG 3672	Gender and the Global Economy ²	
GEOG 3692	Introduction to Global Public Health	
GEOG 3812	Mexico, Central America, and the Caribbean	
GEOG 3822	Geography of China	
GEOG 3862	Geography of Africa	
GEOG 4173	Research Seminar	
GEOG 4501	Water Resources and Water Management of Western United States	
GEOG 4742	Topics in Environment and Society ²	
GEOG 4812	Environment and Development in South America ²	
GEOG 4822	Environment and Development in China ²	

GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take one upper division elective from either the Geographic Information Science, Human Geography, or Physical Geography list.		3-4
Total Credit Hours		19-20

¹ Unless noted, Department enforced prereq. for all courses is GEOG 1962, GEOG 1972, GEOG 1982, or GEOG 1992.

² Core curriculum course.

Physical Geography Concentration

In addition to the courses required of all concentrations complete the following:

Required GEOG course work:

Select at least two of the following:		6-8
GEOG 3351	Biogeography	
GEOG 3511	Introduction to Hydrology	
GEOG 3601	Principles of Climate	
GEOG 4241	Principles of Geomorphology ¹	
Select at least two of the following electives:		6-8
GEOG 3251	Mountain Geography	
GEOG 3301	Analysis of Climate and Weather Observations ¹	
GEOG 3351	Biogeography	
GEOG 3511	Introduction to Hydrology	
GEOG 3601	Principles of Climate	
GEOG 4120	Special Topics in Geography	
GEOG 4173	Research Seminar	
GEOG 4201	Biometeorology	
GEOG 4241	Principles of Geomorphology ¹	
GEOG 4251	Fluvial Geomorphology	
GEOG 4261	Glaciers and Permafrost	
GEOG 4271	The Arctic Climate System	
GEOG 4311	Watershed Biogeochemistry	
GEOG 4321	Snow Hydrology	
GEOG 4331	Mountain Climatology	
GEOG 4371	Forest Geography: Principles and Dynamics	
GEOG 4401	Soils Geography	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	

Take one upper division elective from either the Geographic Information Science, Human Geography, or Environment and Society Geography list.

Ancillary mathematics and science course work:

Two semester sequence in calculus		
Select one of the following sequences:		8-10
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2	
APPM 1350 & APPM 1360	Calculus 1 for Engineers and Calculus 2 for Engineers	

Three semesters of physics and chemistry, including related labs

Select three of the following:		14-15
PHYS 1110	General Physics 1	
PHYS 1120 & PHYS 1140	General Physics 2 and Experimental Physics 1	
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	
Total Credit Hours		37-45

¹ Core curriculum course.

Geographic Information Science Concentration

In addition to the courses required of all concentrations complete the following:

GEOG 4103	Introduction to Geographic Information Science	4
Select three of the following electives:		9-12
GEOG 4043	Cartography 2: Interactive and Multimedia Mapping	
GEOG 4093	Remote Sensing of the Environment	
GEOG 4110	Special Topics in Geography	
GEOG 4120	Special Topics in Geography	
GEOG 4173	Research Seminar	
GEOG 4203	Geographic Information Science: Modeling Applications	
GEOG 4303	GIS Programming for Spatial Analysis	
GEOG 3930	Internship (may be applied to the concentration on a case-by-case basis)	
GEOG 4990	Senior Thesis (may be applied to the concentration on a case-by-case basis)	
Take one upper division elective from either the Human Geography, Environment and Society Geography, or Physical Geography list.		3-4
Total Credit Hours		16-20

Graduating in Four Years

This applies only to the "General Geography" degree. Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee: it is not a requirement for the major. To maintain adequate progress in geography, students should meet the following requirements:

- By the end of the third semester, complete GEOG 1001, GEOG 1011, and one of the following: GEOG 1962, GEOG 1972, GEOG 1982 or GEOG 1992.
- By the end of the sixth semester, complete GEOG 1962, GEOG 1972, GEOG 1982, or GEOG 1992 or an approved upper-division human geography course (must be different than the course used to complete the previous requirement) and 9 credit hours of upper-division geography courses.
- By the end of the sixth semester, complete GEOG 2053 or GEOG 3053 and GEOG 3023.
- By the eighth semester, complete the remaining upper-division credit hours.

Geography - Minor

Information on earning a minor in Geography can be found here (http://geography.colorado.edu/undergrad_program/minor_and_certificates).

The department offers a certificate in hydrology (<http://snobear.colorado.edu/IntroHydro/certificate.html>) for undergraduate students majoring or minoring in Geography.

Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school affiliation.

- Participation in the minor program is optional on the part of the student.
- A minimum of 18 credit hours must be taken in the minor area, including a minimum of 9 upper-division credit hours.
- All course work applied to the minor must be completed with a grade of C- or better. No pass/fail work may be applied. The GPA of all minor degree course work must equal 2.00 (C) or greater.
- Student pursuing an individually structured major, or who are pursuing a major in distributed studies, will not be eligible to earn a minor.
- Students will be allowed to apply no more than 9 credit hours (including 6 upper-division) of transfer work toward a minor.
- Course work applied toward a minor may also be applied toward Core Curriculum and major requirements.

No specific concentration is required. However, students who do wish to focus on one area of geography should see the suggested course lists below. The list of courses may change at the department's discretion.

Physical Geography Focus

The following two courses are prerequisites to all upper-division courses listed further below.

GEOG 1001	Environmental Systems: Climate and Vegetation ¹	4
GEOG 1011	Environmental Systems: Landscapes and Water ¹	4

Among upper-division courses, the following sequences are suggested:

Climatology

GEOG 3301	Analysis of Climate and Weather Observations	3
GEOG 3601	Principles of Climate	3
GEOG 4331	Mountain Climatology	3-4

Biogeography

GEOG 3351	Biogeography	3
GEOG 4371	Forest Geography: Principles and Dynamics	3
GEOG 4401	Soils Geography	3

Hydrology and Geomorphology

GEOG 3511	Introduction to Hydrology ¹	4
GEOG 4241	Principles of Geomorphology	4
GEOG 4321	Snow Hydrology	3-4
GEOG 4401	Soils Geography	3

In addition, you will find it important to complete one course in statistics at the time you commence upper-division work in physical geography. Students considering graduate school in physical geography are strongly

encouraged to complete a year of course work in general chemistry, physics, calculus and statistics.

Upper-Division Courses

GEOG 3301	Analysis of Climate and Weather Observations ¹	3
GEOG 3601	Principles of Climate ¹	3
GEOG 3351	Biogeography	3
GEOG 3511	Introduction to Hydrology ¹	4
GEOG 4241	Principles of Geomorphology ¹	4
GEOG 4261	Glaciers and Permafrost	3
GEOG 4271	The Arctic Climate System	3
GEOG 4311	Watershed Biogeochemistry	3
GEOG 4321	Snow Hydrology	3-4
GEOG 4331	Mountain Climatology	3-4
GEOG 4371	Forest Geography: Principles and Dynamics	3
GEOG 4401	Soils Geography	3

¹ Core curriculum course.

Human Geography Focus

One of the following four courses are prerequisites to all upper-division courses listed further below.

GEOG 1962	Geographies of Global Change	3
GEOG 1972	Environment-Society Geography	3
GEOG 1982	World Regional Geography	3
GEOG 1992	Human Geographies	3

Upper-Division Courses

Additional prerequisites are listed.

GEOG 3672	Gender and the Global Economy ¹	3
GEOG 3682	Geography of International Development	3
GEOG 3742	Place, Power, and Contemporary Culture ¹	3
GEOG 3812	Mexico, Central America, and the Caribbean	3
GEOG 3822	Geography of China ¹	3
GEOG 3832	Geographies of South Asia	3
GEOG 3862	Geography of Africa	3
GEOG 4023	Introduction to Quantitative Methods in Human Geography	4
GEOG 4292	Migration, Immigrant Adaptation, and Development	3
GEOG 4622	City Life	3
GEOG 4712	Political Geography	3
GEOG 4732	Population Geography	3
GEOG 4742	Topics in Environment and Society	3
GEOG 4812	Environment and Development in South America	3
GEOG 4822	Environment and Development in China	3
GEOG 4832	Geography of Tibet	3

¹ Core curriculum course.

Environment-Society Geography Focus

The following two courses are prerequisites to all upper-division physical geography courses listed further below.

GEOG 1001	Environmental Systems: Climate and Vegetation ¹	4
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GEOG 1011	Environmental Systems: Landscapes and Water ¹	4
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GEOG 1972 is a prerequisite for all upper division human and environment society geography courses.

Upper-Division Courses

Additional prerequisites may be listed.

GEOG 3251	Mountain Geography	3
GEOG 3301	Analysis of Climate and Weather Observations ¹	3
GEOG 3351	Biogeography	3
GEOG 3402	Natural Hazards	3
GEOG 3412	Conservation Practice and Resource Management	3
GEOG 3422	Political Ecology	3
GEOG 3511	Introduction to Hydrology ¹	4
GEOG 3601	Principles of Climate ¹	3
GEOG 3612	Geography of American Cities	3
GEOG 3682	Geography of International Development	3
GEOG 3692	Introduction to Global Public Health	3
GEOG 3812	Mexico, Central America, and the Caribbean	3
GEOG 3822	Geography of China ¹	3
GEOG 3862	Geography of Africa	3
GEOG 4401	Soils Geography	3
GEOG 4430	Seminar: Conservation Trends	3
GEOG 4501	Water Resources and Water Management of Western United States	3
GEOG 4742	Topics in Environment and Society	3
GEOG 4632	Development Geography	3
GEOG 4812	Environment and Development in South America	3
GEOG 4822	Environment and Development in China	3
GEOG 4852	Health and Medical Geography	3

¹ Core curriculum course.

Geographic Information Science Focus

Students undertaking the GIS Certificate as well as a GEOG minor must take at least 9 credits of non-GIS GEOG classes to satisfy the minor requirements.

The following are prereqs for all upper division courses, unless otherwise noted.

GEOG 3023	Statistics for Geography	4
GEOG 3053	Cartography: Visualization and Information Design	4

Upper-Division Courses

GEOG 4023	Introduction to Quantitative Methods in Human Geography	4
GEOG 4043	Cartography 2: Interactive and Multimedia Mapping	4
GEOG 4093	Remote Sensing of the Environment	4
GEOG 4103	Introduction to Geographic Information Science	4
GEOG 4203	Geographic Information Science: Modeling Applications	4
GEOG 4173	Research Seminar	3
GEOG 4303	GIS Programming for Spatial Analysis	4

¹ Core curriculum course.

Geological Sciences

The options available in the undergraduate program in geological sciences are geology and geophysics and lead to the BA degree. Both options provide a strong basis for understanding the functioning of the Earth system. Students who are uncertain as to which option best suits their needs should contact a departmental advisor or faculty member. In each option, the undergraduate program emphasizes course work in theoretical, laboratory and field-oriented aspects of the geological sciences. The nearby Rocky Mountains provide a natural laboratory for many of these courses.

Students interested in the geological sciences may also wish to consider the Baker Residential Academic Program (see the Undergraduate Residential Programs section). Students who do not wish to pursue a career in the geosciences, or who would like to combine a basic knowledge of geologic sciences with that of some other field, should consider using geological sciences as one subject in a distributed studies major or as a minor. Students who intend to pursue graduate study in the geological sciences are encouraged to consider developing an honors thesis as part of their undergraduate studies.

The two options available in the undergraduate major offer different focus areas of instruction. Both options offer excellent preparation for students interested in pursuing professional careers, or graduate study, in the geological sciences.

Each option emphasizes knowledge in:

- the ways in which Earth responds to internal and external forces; the physical, chemical and biological evolution of Earth; and the nature of the materials of which the Earth is made
- the role of physics, chemistry, mathematics and biology in understanding geological processes
- the history of discoveries and ideas that have contributed to our current knowledge of Earth and the planetary system

Course code for this program is GEOL.

Geology Honors Program

Opportunity is provided for qualified geology majors to participate in the geology honors program and graduate with honors (cum laude, magna cum laude or summa cum laude) in geology. Students interested in the honors program should contact the departmental honors advisor during their junior year.

Bachelor's Degree

- Geology - Bachelor of Arts (BA) (p. 340)

Minor

- Geology - Minor (p. 342)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

- Abbott, Lon D (https://experts.colorado.edu/display/fisid_145044)
Senior Instructor
- Anderson, Robert S (https://experts.colorado.edu/display/fisid_130117)
Distinguished Professor; PhD, University of Washington
- Andrews, John T.
Professor Emeritus
- Atkinson, William W. Jr
Professor Emeritus
- Bilham, Roger G.
Professor Emeritus
- Birkeland, Peter W.
Professor Emeritus
- Bradley, William C.
Professor Emeritus
- Budd, David A (https://experts.colorado.edu/display/fisid_101963)
Professor; PhD, University of Texas at Austin
- Chin, Karen (https://experts.colorado.edu/display/fisid_122666)
Associate Professor; PhD, University of California-Santa Barbara
- Eberle, Jaelyn J (https://experts.colorado.edu/display/fisid_126544)
Associate Professor; PhD, University of Wyoming
- Eicher, Don L.
Professor Emeritus
- Farmer, G Lang (https://experts.colorado.edu/display/fisid_100498)
Professor; PhD, University of California-Los Angeles
- Flowers, Rebecca M (https://experts.colorado.edu/display/fisid_144054)
Associate Professor; PhD, Massachusetts Institute of Technology
- Ge, Shemin (https://experts.colorado.edu/display/fisid_101387)
Professor; PhD, Johns Hopkins University
- Goetz, F. H. Alexander
Professor Emeritus
- Hynek, Brian Michael (https://experts.colorado.edu/display/fisid_130622)
Associate Professor; PhD, Washington University
- Jakosky, Bruce M (https://experts.colorado.edu/display/fisid_105845)
Professor; PhD, California Institute of Technology
- Jones, Craig H (https://experts.colorado.edu/display/fisid_105590)
Professor; PhD, Massachusetts Institute of Technology
- Kraus, Mary J (https://experts.colorado.edu/display/fisid_100903)
Professor; PhD, University of Colorado Boulder
- Larson, Edwin E.
Professor Emeritus
- Lester, Alan P. (https://experts.colorado.edu/display/fisid_105385)
Lecturer; PhD, University of Colorado Boulder
- Mahan, Kevin H (https://experts.colorado.edu/display/fisid_143975)
Associate Professor; PhD, University of Massachusetts at Amherst
- Marchitto, Thomas (https://experts.colorado.edu/display/fisid_128241)
Associate Professor; PhD, Massachusetts Institute of Technology
- Miller, Gifford Hubbs (https://experts.colorado.edu/display/fisid_102374)
Professor; PhD, University of Colorado Boulder
- Mojzsis, Stephen J (https://experts.colorado.edu/display/fisid_118484)
Professor; PhD, University of California-San Diego
- Molnar, Peter Hale (https://experts.colorado.edu/display/fisid_114528)
Professor; PhD, Columbia University In the City of New York
- Mueller, Karl Jules (https://experts.colorado.edu/display/fisid_107629)
Professor; PhD, University of Wyoming
- Munoz, James L.
Professor Emeritus
- Robinson, Peter
Professor Emeritus
- Runnells, Don
Professor Emeritus
- Sepulveda Arellano, Julio Cesar (https://experts.colorado.edu/display/fisid_154923)
Assistant Professor; PhD, University of Bremen (Germany)
- Sheehan, Anne (https://experts.colorado.edu/display/fisid_103645)
Professor; PhD, Massachusetts Institute of Technology
- Smyth, Joseph R (https://experts.colorado.edu/display/fisid_101056)
Professor; PhD, University of Chicago
- Snell, Kathryn Elaine (https://experts.colorado.edu/display/fisid_155298)
Assistant Professor; PhD, University of California-Santa Cruz
- Spetzler, Hartmut A. W.
Professor Emeritus
- Stern, Charles R (https://experts.colorado.edu/display/fisid_100941)
Professor; PhD, University of Chicago
- Syvitski, James P (https://experts.colorado.edu/display/fisid_107424)
Professor; PhD, Univ of British Columbia (Canada)
- Templeton, Alexis S (https://experts.colorado.edu/display/fisid_141202)
Associate Professor; PhD, Stanford University
- Tiampo, Kristy F (https://experts.colorado.edu/display/fisid_155908)
Professor; PhD, University of Colorado Boulder
- Tilton, Eric Small (https://experts.colorado.edu/display/fisid_126548)
Professor; PhD, University of California-Santa Cruz
- Tucker, Gregory E (https://experts.colorado.edu/display/fisid_130605)
Professor; PhD, Pennsylvania State University
- Walker, Theodore R.
Professor Emeritus
- Weimer, Paul (https://experts.colorado.edu/display/fisid_104630)
Professor; PhD, University of Texas at Austin
- White, James (https://experts.colorado.edu/display/fisid_102726)
Professor; PhD, Columbia University In the City of New York

GEOL 1010 (3) Introduction to Geology

Introductory geology for majors and non-majors. Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. Separate lab (GEOL 1030) is recommended.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Natural Science

GEOL 1020 (3) Introduction to Earth History

Examines how Earth's interior and surface, the atmosphere and climate, the oceans, and life interact and have changed over the immensity of geologic time. For majors and non-majors. Separate lab (GEOL 1030) is recommended.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 1040

Requisites: Requires prerequisite course of GEOL 1010 (minimum grade D-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 1030 (1) Introduction to Geology Laboratory 1

Features field trips to local points of geologic interest. Studies rocks and topographic and geologic maps. Meets the MAPS requirement for natural science lab, if taken with GEOL 1010.

Recommended: Requisite prior or current registration in 1000-level geology course.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

GEOL 1040 (3) Geology of Colorado

Reviews the geologic evolution and history of Colorado. It first develops the basic concepts needed to interpret the geology and then systematically shows how the state evolved through geologic time. Designed for those who enjoy understanding the beauty and splendor of the state.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 1020

Additional Information: Arts Sci Core Curr: Natural Science Sequence

GEOL 1060 (3) Global Change: An Earth Science Perspective

Focuses on evidence for planetary warming, climate change, glacier and ice-sheet melting and sea level rise both now and in the recent past. Attempts to develop understanding of the interactions within the coupled Earth system that regulate such changes. Utilizes examples from the geological and instrumental records, and evaluates the global warming forecast. Department enforced prerequisite: GEOL 1010 (minimum grade D-).

Equivalent - Duplicate Degree Credit Not Granted: ATOC 1060

Additional Information: Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Natural Science

GEOL 2001 (4) Planet Earth

Explores the dynamics of planet Earth with particular emphasis on the factors that make the planet habitable. Includes examination of heat balance, hydrology, geomorphology, biogeochemistry and climate history through both lecture and lab-based activities. Required for the Geology major, introduces students to the major concepts in contemporary Earth system science.

Requisites: Requires prerequisite course of GEOL 1010 or GEOL 2100 or ENVS 1000 (minimum grade D-).

GEOL 2005 (4) Introduction to Earth Materials

Provides introduction to the classification, composition and properties of the materials that compose the Earth, how these materials are studied, and how they are used to interpret Earth history and processes. Required for the Geology major.

Requisites: Requires prerequisite courses of GEOL 1010 or GEOL 2100 and CHEM 1113 and CHEM 1114 (all minimum grade D-).

GEOL 2040 (3) The Search for Life in the Universe

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 2040

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 2100 (3) Environmental Geology

Introduces the influences of geologic processes on human lives and the changes human actions cause in geologic systems. Uses examples and case studies from Colorado and the West.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 2700 (2) Introduction to Field Geology

Introduces basic field techniques necessary to collect geologic data and samples, and necessary to map geologic units.

Requisites: Requires prerequisite courses of GEOL 1010 and GEOL 1030 and GEOL 2005 (all minimum grade D-).

GEOL 3010 (3) Introduction to Mineralogy

Covers origin, occurrence, identification, classification, and uses of minerals with emphasis on applications of mineralogy to economic geology and petrology. Two lectures and one lab per week.

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 and GEOL 2005 and MATH 1300 or APPM 1350 (all minimum grade D-).

Recommended: Prerequisite GEOL 2005.

GEOL 3020 (3) Petrology

Studies field relations, petrography, petrology, chemistry, and origins of igneous and metamorphic rocks by means of lectures, reading, and lab and field experience. Labs include instruction in the fundamentals of optical petrography and the study of rocks in thin section.

Requisites: Requires prerequisite course of GEOL 2005 or GEOL 3010 (minimum grade D-).

GEOL 3023 (4) Statistics for Geography

Introduces parametric and distribution-free statistics, emphasizing applications to earth science problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3023

GEOL 3030 (3) Introduction to Hydrogeology

Introduces groundwater flow concepts, hydrologic cycle, physical and chemical properties, flow net, hydraulic potential, geologic controls on heterogeneity and anisotropy, aquifers and aquitards in a geologic system, saturated and unsaturated flow, flow to a well, pumping tests, and role of groundwater in geologic processes.

Requisites: Requires prerequisite courses of GEOL 1010 and MATH 1300 or APPM 1350 (all minimum grade D-).

GEOL 3040 (3) Global Change: The Recent Geological Record

Geological records in lakes, oceans, deserts, and around glaciers indicate the significant changes in the global systems that have taken place over the last few hundred or thousand years. Explores the timing and nature of these changes. Department enforced prerequisites: any two-course sequence of natural science core courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4070

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 3050 (2) GIS for Geologists

Provides an introduction to Geographic Information Systems (GIS) techniques focused on geological applications. Covers GIS analyzing, mapping and GPS use. Basic computer skills are a plus before entering the class.

GEOL 3070 (3) Introduction to Oceanography

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3070

Recommended: Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 3090 (3) Developing Scientific Writing Skills

Focuses on the development of scientific writing skills. Enhances student ability to write professionally, revise text and review the work of others. Writing assignments integrate the subject matter of different topics in earth science. Department enforced prerequisites: a lower division writing course and one of the following: GEOL 2001 or GEOL 2005 or GEOL 2700 or GEOL 3010 or GEOL 3030 or GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 3820.

Additional Information: Arts Sci Core Curr. Written Communication

GEOL 3120 (4) Structural Geology

Introduces the basic principles and processes involved in deformation of natural rocks and minerals and the techniques used to analyze a variety of common geological structures (e.g., fractures, folds, fault zones).

Requisites: Requires prerequisite course of GEOL 1010 and GEOL 2005 (minimum grade D-).

Recommended: Prerequisite GEOL 2001.

GEOL 3130 (3) Global Warming: Understanding the Forecast

Uses the example of man-made climate change to develop an analytical understanding of the Earth system (solid, fluid, and living) that can be used to interpret the complex and uncertain forecast. Emphasis is given to the concepts of forcing, feedback and response in order to examine natural vs. man-made environmental changes and climate change mitigation strategies.

GEOL 3300 (3) Extraterrestrial Life

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; the possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 3300

GEOL 3320 (3) Introduction to Geochemistry

Introduces chemical principles as applied to geologic processes. Includes an introductory discussion of mineral and rock chemistry, aqueous geochemistry, and organic geochemistry.

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 and MATH 1300 or APPM 1350 (all minimum grade D-).

GEOL 3410 (3) Paleobiology

Surveys morphology, ecology and evolution of ancient animal and plant life and their interactions on Earth. Fossils used to solve geological and biological problems. Department enforced prerequisites: GEOL 1010 and GEOL 1020 or GEOL 2005 or EBIO 1030 and EBIO 1040 or EBIO 1210 and EBIO 1220.

GEOL 3430 (4) Sedimentology and Stratigraphy

Introduces the study of sedimentary rocks emphasizing their origin, characteristics, and interpretation; and the principles and techniques for establishing the temporal order and spatial distribution of sedimentary layers.

Requisites: Requires prerequisite course of GEOL 2005 or GEOL 3010 (minimum grade D-).

Additional Information: Departmental Category: Geology

GEOL 3520 (3) Energy & Climate Change: An Interdisciplinary Approach

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics. Department enforced prerequisite: a two-course sequence in any natural science.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3520

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 3540 (3) Introduction to Petroleum Geology

Discusses the origin and distribution of conventional and unconventional petroleum resources, source rocks, types of traps and seals, reservoir rock properties, exploration methods (seismic data analysis and interpretation, formation evaluation, subsurface mapping), reservoir characterization and modeling, reserves calculations. Department enforced prerequisite: GEOL 1010.

Recommended: Corequisite GEOL 3430.

Additional Information: Departmental Category: Geology

GEOL 3720 (3) Evolution of Life: The Geological Record

Discusses the evolution of life on Earth, beginning with the earliest origins and surveying the major steps that led to the rise of higher plants and animals. Covers modern ideas on the causes of periodic mass extinctions in both the marine and terrestrial realms. Emphasizes geologic evidence for the pathways of evolution, using examples from the ordinary to the bizarre.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 3820 (4) The Fluid Earth

Examines the myriad forms of fluid behavior found on Earth, from the atmosphere to the inner core. Explores how basic principles of fluid physics may be used to understand a broad range of earth processes, including mantle convection, atmosphere and ocean dynamics, stream flow, lava spreading, and glacier motion, among others. Covers fundamental fluid concepts such as viscosity, pressure, convection, friction, and free-surface flow. Department enforced prerequisites: MATH 1300 or APPM 1340 and APPM 1345 or APPM 1350.

Recommended: Prerequisites GEOL 1010 and PHYS 1110.

GEOL 3930 (1-6) Internship

Offers an academically supervised opportunity for geological sciences majors to work with public or private organizations. Projects are usually associated with students' career goals; each project has an academic emphasis. Department enforced prerequisites: restricted to students with 57-180 credits (Juniors or Seniors) and completion of at least two courses (minimum grade B) for geology majors.

GEOL 3950 (3) Natural Catastrophes and Geologic Hazards

Surveys historic and prehistoric natural disasters, their cause and potential for recurrence. Meteorite impact, earthquakes, volcanic eruptions, tsunamis, landslides, floods, magnetic reversals and major extinction events. Department enforced prerequisite: one year of science.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 4060 (4) Oceanography

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data. Department enforced prerequisite: one semester chemistry or physics or geology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5060

GEOL 4070 (3) Paleoclimatology

Covers the primary forcings and feedbacks that determine Earth's energy balance and the resultant climate system on decadal to millennial time scales. Covers ocean/atmosphere circulation, the role of ice sheets in the climate system, monsoons, Holocene climate change and 20th Century warming. Includes coverage of the proxies available to reconstruct climates of the past and the archives that contain these proxies. Department enforced prerequisite: environmental science or geology introduction sequence courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3040

Recommended: Prerequisite natural science majors only.

GEOL 4093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors, as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5093 and GEOG 4093 and GEOG 5093

GEOL 4130 (3) Principles of Geophysics

Provides an introduction to fundamental geophysics including seismology, geomagnetism, gravity, radiometric dating, and heat flow with applications to plate tectonics and exploration of the subsurface.

Requisites: Requires prerequisite courses of MATH 1300 or APPM 1350 and PHYS 1110 and GEOL 1010 (all minimum grade D-).

GEOL 4150 (2) Planetary Field Geology

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5150

GEOL 4160 (3) Introduction to Biogeochemistry

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments. Department enforced prerequisites: GEOL 3320 or EBIO 3270 and CHEM 1011.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4160 and ENVS 4160

GEOL 4215 (3) Geochronology and Thermochronology

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5215

GEOL 4241 (4) Principles of Geomorphology

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4241

Requisites: Requires prerequisite course of GEOG 1011 or GEOL 1010 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade D-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 4270 (3) Marine Chemistry and Geochemistry

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical separation in seawater; the marine carbon cycle and its long-term control on atmospheric CO₂; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5270

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites introductory chemistry, introductory geology, introductory oceanography.

GEOL 4330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5330 and ASTR 4330 and ASTR 5330

GEOL 4474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups. Department enforced prerequisites: GEOL 1010 and GEOL 1020 and GEOL 3410.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5474

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOL 4500 (3) Critical Thinking in the Earth Sciences

Deals with controversies within the broad realm of geological sciences, including planetary geology, evolution, paleobiology, global change, environmental issues, plate tectonics, resources, other societal problems, or geologic thought in general. Students are provided the opportunity to analyze and debate scientific issues in the earth sciences. Department enforced prerequisites: GEOL 1010 and GEOL 1030 and GEOL 2001 or GEOL 2005 or GEOL 2700 (minimum grade D-).

Repeatable: Repeatable for up to 6.00 total credit hours.

GEOL 4550 (3) Petroleum Reservoir Characterization and Modeling

Introduces concepts and methods of petroleum reservoir analysis and 3-D reservoir modeling using subsurface data (cores, well logs, 3-D seismic) and outcrop analogs. Examines petroleum system, petrophysics (lithology, porosity, permeability, capillary pressure, flow units), and sequence-stratigraphic, facies, and structural controls on reservoir properties, heterogeneity and recovery efficiency. Deterministic and stochastic reservoir modeling methods are addressed. Department enforced prerequisites: GEOL 1010 and GEOL 3430.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5550

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOL 4670 (3) Isotope Geology

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5670

Requisites: Requires prerequisite a course of MATH 1300 or APPM 1350 (minimum grade D-).

GEOL 4675 (3) Stable Isotopes in Paleoclimate and Paleoecology

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5675

Grading Basis: Letter Grade

GEOL 4700 (1-4) Special Geological Topics

Studies in selected geological subjects of special current interest (for undergraduates).

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOL 4711 (2) Igneous and Metamorphic Field Geology

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units.

Requisites: Requires prerequisite courses of GEOL 3020 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

GEOL 4712 (2) Structural Field Geology

Explores methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape.

Requisites: Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

GEOL 4714 (2) Field Geophysics

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic, and electrical measurements.

Requisites: Requires prerequisite courses of GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110 (all minimum grade D-).

GEOL 4715 (2) Field Techniques in Hydrogeology

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography, and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring stream flows, interpreting aquifer parameters from geophysical measurements, and using field data for water budget analysis.

Requisites: Requires prerequisite courses of GEOL 3030 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

GEOL 4716 (2) Environmental Field Geochemistry

Develops basic field skills in the most commonly performed tasks required for the environmental characterization of solid and aqueous wastes. Media of study include soils, stream sediments, surface waters, ground waters, and atmospheric particulates.

Requisites: Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3320 and CHEM 1011 and CHEM 1031 or CHEM 1113 and CHEM 1133 (all minimum grade D-).

GEOL 4717 (2) Field Seminar in Geology and Tectonics

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S.

Requisites: Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 4241 (all minimum grade D-).

GEOL 4721 (2) Field Methods in Active Tectonics

Analysis of active geologic structures, including strike slip fault systems, secondary structures in stepovers and related eruptive centers. Includes the use of digital imagery, elevation models, offset geomorphic features and Quaternary deposits to determine local deformation rates and their relation to plate motions.

Requisites: Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

Recommended: Prerequisite GEOL 4712.

GEOL 4725 (1-4) Field Based Special Topics in Geoscience

Explores selected geological subjects of special interest in a field setting.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5725

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

GEOL 4840 (1-3) Independent Study in Geology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4841 (1-3) Independent Study-Economic Geology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4842 (1-3) Independent Study-Petrology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4843 (1-3) Independent Study-Sedimentology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4844 (1-3) Independent Study-Structure/Tectonics

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4845 (1-3) Ind Stdy-Geochemistry

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4846 (1-3) Independent Study-Geophysics

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4847 (1-3) Independent Study-Hydrology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4849 (1-3) Independent Study-Paleontology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4851 (1-3) Independent Study in Geoscience Education

Repeatable: Repeatable for up to 3.00 total credit hours.

GEOL 4990 (1-3) Honors Thesis

Supervised project involving original research in any area of the geological sciences. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended. Must be accepted by the departmental honors committee. Department enforced prerequisite: minimum cumulative GPA of 3.30.

Additional Information: Arts Sciences Honors Course

Geology - Bachelor of Arts (BA)

The options available in the undergraduate program in geological sciences are geology and geophysics and lead to the BA degree. Both options provide a strong basis for understanding the functioning of the Earth system. Students who are uncertain as to which option best suits their needs should contact a departmental advisor or faculty member. In each option, the undergraduate program emphasizes course work

in theoretical, laboratory and field-oriented aspects of the geological sciences. The nearby Rocky Mountains provide a natural laboratory for many of these courses.

Students interested in the geological sciences may also wish to consider the Baker Residential Academic Program. Students who do not wish to pursue a career in the geosciences, or who would like to combine a basic knowledge of geologic sciences with that of some other field, should consider using geological sciences as one subject in a distributed studies major or as a minor. Students who intend to pursue graduate study in the geological sciences are encouraged to consider developing an honors thesis as part of their undergraduate studies.

The two options available in the undergraduate major offer different focus areas of instruction. Both options offer excellent preparation for students interested in pursuing professional careers, or graduate study, in the geological sciences.

Each option emphasizes knowledge in:

- the ways in which Earth responds to internal and external forces; the physical, chemical and biological evolution of Earth; and the nature of the materials of which the Earth is made
- the role of physics, chemistry, mathematics and biology in understanding geological processes
- the history of discoveries and ideas that have contributed to our current knowledge of Earth and the planetary system

Geology Track

The geology option emphasizes processes that function both in the solid earth and at Earth's surface:

- the mineralogy and petrology of igneous, metamorphic and sedimentary rocks
- the processes of sedimentation and the applications of stratigraphy and paleobiology in the reconstruction of Earth history
- the role of geophysics and geochemistry in understanding the nature of Earth and its history
- the study of faults, folds and other rock structures and the tectonic processes that create those structures
- the methods used in the field to map and interpret the diverse variety of rock types and structures
- the function of the integrated Earth system including the atmosphere, hydrosphere, biosphere and geosphere
- the fundamental controls on surface Earth processes including energy balance, hydrology, geomorphology, geochemistry and biogeochemistry
- the role of humans in the Earth system

Geophysics Track

The geophysics option emphasizes:

- applications of fundamental mathematical formulations and physical principles to an understanding of the Earth
- methods utilized to map and characterize those portions of the planet that lie below the surface, from just beneath our feet down to the core

International Bachelor of Arts

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong,

Wollongong, Australia. To earn an IBA in geology, in addition to completing all the current requirements for the BA with a major in geology at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Required Courses and Credit Hours

Students in either the geology option or the geophysics option must take the following course work in GEOL.

GEOL 1010	Introduction to Geology	3
or GEOL 2100	Environmental Geology	
GEOL 1030	Introduction to Geology Laboratory 1	1
GEOL 2001	Planet Earth	4
GEOL 2005	Introduction to Earth Materials	4
GEOL 2700	Introduction to Field Geology	2
Total Credit Hours		14

Ancillary Course Work

Students in either the geology option or the geophysics option must take the following course work from outside GEOL.

Complete a general chemistry sequence:

CHEM 1113	General Chemistry 1	
& CHEM 1114	and Laboratory in General Chemistry 1	
CHEM 1133	General Chemistry 2	
& CHEM 1134	and Laboratory in General Chemistry 2	
Select one of the following Calculus 1 & 2 sequences:		8-10
MATH 1300	Calculus 1	
& MATH 2300	and Calculus 2	
APPM 1350	Calculus 1 for Engineers	
& APPM 1360	and Calculus 2 for Engineers	

Complete a calculus-based general physics sequence:

PHYS 1110	General Physics 1	
PHYS 1120	General Physics 2	
PHYS 1140	Experimental Physics 1	
Total Credit Hours		8-10

Geology Option

Students electing the geology option are required to take the following additional courses:

Select one of the following solid earth courses:		3-4
GEOL 3010	Introduction to Mineralogy	
GEOL 3020	Petrology	
GEOL 3120	Structural Geology	
GEOL 3320	Introduction to Geochemistry	
GEOL 3430	Sedimentology and Stratigraphy	
GEOL 4130	Principles of Geophysics	
Select one of the following surface processes courses:		3-4
GEOL 3030	Introduction to Hydrogeology	
GEOL 3320	Introduction to Geochemistry	
GEOL 3410	Paleobiology	
GEOL 3430	Sedimentology and Stratigraphy	
GEOL 3820	The Fluid Earth	
GEOL 4060	Oceanography	

GEOL 4160	Introduction to Biogeochemistry	
GEOL 4241	Principles of Geomorphology	
Select one of the following quantitative geoscience courses:		3
GEOL 3010	Introduction to Mineralogy	
GEOL 3030	Introduction to Hydrogeology	
GEOL 3820	The Fluid Earth	
GEOL 4130	Principles of Geophysics	
GEOL 4241	Principles of Geomorphology	
Select two of the following advanced-field modules:		4-5
GEOL 4711	Igneous and Metamorphic Field Geology	
GEOL 4712	Structural Field Geology	
GEOL 4714	Field Geophysics	
GEOL 4715	Field Techniques in Hydrogeology	
GEOL 4716	Environmental Field Geochemistry	
GEOL 4717	Field Seminar in Geology and Tectonics	
GEOL 4721	Field Methods in Active Tectonics	
EVEN 4100	Environmental Sampling and Analysis	

Upper-division electives

Sufficient additional upper-division course work from following list to total 27 upper-division credits. (Of these, a minimum of 18 upper division credits must be GEOL.)¹

Any GEOL 3000- to 4000-level course (with exceptions, see footnote) ²		
Or approved non-GEOL courses from following list:		
APPM 3050	Scientific Computing in Matlab	
ASTR 3710	Formation & Dynamics of Planetary Systems	
ASTR 3720	Planets and Their Atmospheres	
ASTR 3750	Planets, Moons, and Rings	
ASTR 4800	Space Science: Practice and Policy ¹	
ATOC 4720	Introduction to Atmospheric Dynamics	
ATOC 4800	Policy Implications of Climate Controversies ¹	
CHEM 4511	Physical Chemistry 1	
CVEN 4404	Water Chemistry	
CVEN 4718	Mechanics and Dynamics of Glaciers	
EBIO 3080	Evolutionary Biology	
EBIO 3270	Ecosystem Ecology	
EBIO 3850	Animal Diversity: Invertebrates	
EBIO 4030	Limnology	
EBIO 4060	Landscape Ecology	
EBIO 4410	Biometry	
EBIO 4500	Plant Biodiversity and Evolution	
ECON 3403	International Economics and Policy ¹	
ENVD 4023	Environmental Impact Assessment ¹	
ENVS 3434	Introduction to Applied Ecology	
EVEN 4100	Environmental Sampling and Analysis	
GEOG/ENVS 4201	Biometeorology	
GEOL 4251	Fluvial Geomorphology	
GEOL 4261	Glaciers and Permafrost	
GEOL 4321	Snow Hydrology	
GEOL 4401	Soils Geography	
MCDB 4350	Microbial Diversity and the Biosphere	
MUSM 4914	Museum Practicum in Geology	

PSCI 4183	International Law ¹
Total Credit Hours	
	27-30

¹ Note: A maximum of 3 of these credit hours may consist of a policy course from the following list:

- ASTR 4800 Space Science: Practice and Policy
- ATOC 4800 Policy Implications of Climate Controversies
- ECON 3403 International Economics and Policy
- ENVD 4023 Environmental Impact Assessment
- PSCI 4183 International Law

² GEOL 3040, GEOL 3070, GEOL 3520, GEOL 3720, GEOL 3950, and GEOL 4500 cannot be used to fulfill the upper division elective requirements.

Geophysics Option

Students electing the geophysics option are required to take the following additional courses:

The following solid earth, surface processes and quantitative geoscience courses:

GEOL 3010	Introduction to Mineralogy	3
GEOL 3020	Petrology	3
or GEOL 3320	Introduction to Geochemistry	
GEOL 3120	Structural Geology	4
GEOL 4130	Principles of Geophysics	3
GEOL 4714	Field Geophysics	2

Ancillary non-GEOL courses:

APPM 2350	Calculus 3 for Engineers	4
or MATH 2400	Calculus 3	
APPM 2360	Introduction to Differential Equations with Linear Algebra	4

PHYS 2130	General Physics 3	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3

Select two of the following non-GEOL courses: 6

APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	
MATH 4470	Partial Differential Equations	
PHYS 3210	Classical Mechanics and Mathematical Methods 2	
PHYS 3310	Principles of Electricity and Magnetism 1	

Total Credit Hours 35

Additional information on required courses and other departmental requirements may be obtained from the departmental office. Students should contact the department for a list of current major requirements.

Transfer students must satisfactorily complete a minimum of 12 credit hours of advanced work (3000-level or above) in the Department of Geological Sciences in Boulder if they wish to obtain a degree in geology from CU-Boulder. Before registering for the first time, or within the first week of the semester, such students must see a geological sciences department undergraduate advisor to have previous course work in geology, math and allied sciences evaluated.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a

requirement for the major. To maintain adequate progress in geology, students should meet all college requirements plus specific departmental requirements. These departmental requirements vary slightly between the two major options. Detailed information is available from the department office, but in general these requirements include:

- Declare a geology major and begin course work in the major during the first semester freshman year.
- Meet with a departmental advisor prior to the second and fifth semesters and during the seventh semester.
- Complete at least 33 credit hours (geology option; 44 credit hours for geophysics option) required for the major by the end of the fourth semester.
- Complete at least 47 credit hours (geology option; 63 credit hours for geophysics option) required for the major by the end of the sixth semester.
- Complete the remaining requirements for the major by the end of the eighth semester.

Geology - Minor

The minor program in geological sciences is meant for students who would like to acquire a basic knowledge of geology in addition to their major area of study.

Requirements

The College of Arts and Sciences' requirements for a minor include a minimum of 18 credit hours in the minor area, including a minimum of 9 upper-division credit hours. The departmental requirements for the minor are listed below. The department strongly urges students interested in pursuing a minor in geology to consult a departmental advisor.

Required Courses and Semester Credit Hours

Select one of the following 1000-level introductory sequence: 6

GEOL 1010 & GEOL 1020	Introduction to Geology and Introduction to Earth History	
GEOL 1010 & GEOL 1040	Introduction to Geology and Geology of Colorado	
GEOL 1010 & GEOL 1060	Introduction to Geology and Global Change: An Earth Science Perspective	
GEOL 1030	Introduction to Geology Laboratory 1	1

Select at least one of the following laboratory or field-oriented courses: 2-4

GEOL 2001	Planet Earth	
GEOL 2700	Introduction to Field Geology	
GEOL 3010	Introduction to Mineralogy	
GEOL 3023	Statistics for Geography	
GEOL 3120	Structural Geology	
GEOL 3410	Paleobiology	
GEOL 3430	Sedimentology and Stratigraphy	
GEOL 4060	Oceanography	
GEOL 4093	Remote Sensing of the Environment	
GEOL 4130	Principles of Geophysics	
GEOL 4241	Principles of Geomorphology	

Additional geology coursework to bring the total upper division credit hours to 9 and total credit hours in geology to 18

Total Credit Hours 18-20

Germanic and Slavic Languages and Literatures

Undergraduate students may choose to major in either German studies or Russian studies; minors are offered in both. The department also offers a minor in Nordic studies.

Course codes for these programs are DANE, FINN, GRMN, GSLL, NORW, RUSS, SCAN and SWED.

Bachelor's Degrees

- German Studies - Bachelor of Arts (BA) (p. 355)
- Russian Studies - Bachelor of Arts (BA) (p. 358)

Minors

- German Studies - Minor (p. 357)
- Nordic Studies - Minor (p. 357)
- Russian Studies - Minor (p. 362)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Firestone, Robert
Professor Emeritus

Gerwig, Inger-Johanne
Professor Emeritus

Greaney, Patrick F. (https://experts.colorado.edu/display/fisid_122807)
Professor; PhD, Johns Hopkins University

Grove, Vicki Jean (https://experts.colorado.edu/display/fisid_103689)
Senior Instructor; PhD, University of Colorado Boulder

Hintz, Saskia Barbara (https://experts.colorado.edu/display/fisid_144506)
Senior Instructor; PhD, New York University

Hoecker, Arne (https://experts.colorado.edu/display/fisid_152973)
Assistant Professor; PhD, Johns Hopkins University

Jany, Ursula Berit (https://experts.colorado.edu/display/fisid_154411)
Instructor; PhD, Ohio State University

Kostoglodova, Elena Yurievna (https://experts.colorado.edu/display/fisid_100976)
Senior Instructor; MA, University of Colorado Boulder

Lee, C. Nicholas
Professor Emeritus

Leiderman, Mark N (https://experts.colorado.edu/display/fisid_115326)
Professor; Dr habil, Ural State Pedagogical Univ (Russia)

Mikhailova, Tatiana Alekseevna (https://experts.colorado.edu/display/fisid_135187)
Senior Instructor; MA, Ural State Univ (Russia)

Muller-Sievers, Helmut Heinz (https://experts.colorado.edu/display/fisid_147511)
Professor; PhD, Stanford University

Osterman, Laura Olson (https://experts.colorado.edu/display/fisid_109800)
Associate Professor; PhD, Yale University

Plank, D. L.
Professor Emeritus

Romanov, Artemi (https://experts.colorado.edu/display/fisid_100659)
Professor; MA, SUNY at Binghamton

Salys, Rimgaila
Professor Emeritus

Sampson, Earl D.
Professor Emeritus

Schindler, Patricia A.
Professor Emeritus

Schmiesing, Ann C (https://experts.colorado.edu/display/fisid_106248)
Professor; PhD, University of Cambridge (England)

Senderovich, Aleksandr M (https://experts.colorado.edu/display/fisid_152981)
Assistant Professor; PhD, Harvard University

Stimilli, Davide (https://experts.colorado.edu/display/fisid_134650)
Associate Professor; PhD, Yale University

Stone, Lauren Shizuko (https://experts.colorado.edu/display/fisid_154888)
Assistant Professor; PhD, New York University

Weber, Beverly Marie (https://experts.colorado.edu/display/fisid_144523)
Associate Professor; PhD, University of Massachusetts at Amherst

DANE 1010 (4) Beginning Danish I-DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society.

Additional Information: Departmental Category: Danish Courses

DANE 1020 (4) Beginning Danish II-DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society. Department enforce prerequisite: DANE 1010 (min grade C-).

Additional Information: Departmental Category: Danish Courses

DANE 2010 (4) Intermediate Danish I - DILS

Building on the skills that the students have acquired in Beginners Danish I-II, this course offers additional reading, writing, speaking and verbal comprehension. Students will learn to conduct business at a government office, talk about holidays and festivals and discuss conservation and environmental protection. They will read and write small texts, becoming exposed to differences between written and spoken Danish.

Requisites: Requires prerequisite course of DANE 1020 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Danish Courses

DANE 2020 (4) Intermediate Danish II - DILS

Offers extensive reading, writing, speaking and verbal comprehension skills in Danish. The students will discuss Danish history, cultural differences and stereotypes, politics, social groups, learn how to write letters and email in Danish, read short texts and write short essays on the above topics.

Requisites: Requires prerequisite course of DANE 2010 (minimum grade C-).

Additional Information: Departmental Category: Danish Courses

FINN 1010 (4) Beginning Finnish 1 - DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class.

Additional Information: Departmental Category: Finnish Courses

FINN 1020 (4) Beginning Finnish 2- DILS

Continuation of Beginning Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1010 (minimum grade C-).

Additional Information: Departmental Category: Finnish Courses

FINN 2010 (4) Intermediate Finnish 1 - DILS

Continuation of Beginning Finnish 2. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1020 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Finnish Courses

FINN 2020 (4) Intermediate Finnish 2 - DILS

Continuation of Intermediate Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 2010 (minimum grade C-).

Additional Information: Departmental Category: Finnish Courses

GRMN 1010 (4) Beginning German 1

Introduction to language and culture of the German-speaking world, with emphasis on the acquisition of basic communication skills in cultural context. For students with no previous training in German.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1030

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: German

GRMN 1020 (4) Beginning German 2

Continued development of German-language skills and cultural knowledge for effective communication. Emphasis on more complex language structures and sustained interactions. Department enforced prerequisite: GRMN 1010 (min grade of C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1030

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: German

GRMN 1030 (5) Intensive Beginning German

Covers the same material as GRMN 1010 and GRMN 1020 in one course. Focuses on acquiring ability to understand and speak everyday German; on developing reading and writing skills; and on learning about the cultures of the German-speaking countries.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1010 and GRMN 1020

Additional Information: Departmental Category: German

GRMN 1500 (3) German for Reading Knowledge

Designed especially for graduate students. Emphasizes analytical skills for acquiring reading proficiency in specialized and technical German in one's field of research. Recommended for pass/fail registration. Does not satisfy the arts and sciences foreign language requirement. Does not count towards the German major.

Additional Information: Departmental Category: German

GRMN 1601 (3) Germany Today

Introduces the culture of contemporary German-speaking central Europe, examining historical processes, social and political patterns, and the intellectual and artistic responses to problems of the 20th and 21st centuries. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: German Courses Taught in English

GRMN 1602 (3) Metropolis and Modernity

An interdisciplinary introduction to the modern industrial city in Europe and the USA, with particular attention to the representation of urbanism in the visual arts. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 1701 (3) Nature and Environment in German Literature and Thought

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green Party. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 1701

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 2010 (4) Intermediate German 1

Development of skills for independent use of German. Discussions, writing and listening/viewing activities that address topics of the contemporary German-speaking world. Department enforced prerequisite: GRMN 1020 or 1030 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2030

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: German

GRMN 2020 (4) Intermediate German 2

Development of communication skills and knowledge about recent social, cultural and political developments in German speaking countries through texts, media and film. Department enforced prerequisite: GRMN 2010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2030

Additional Information: Departmental Category: German

GRMN 2030 (5) Intensive Intermediate German

Covers the same material as GRMN 2010 and GRMN 2020 in one semester. Offers review and continuation of basic skills begun in the first year: reading, writing, speaking and oral comprehensive. Department enforced prerequisite: GRMN 1020 or GRMN 1030 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2010 and GRMN 2020

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: German

GRMN 2301 (3) Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich

Examines social culture and everyday life in Nazi Germany. Topics include the role of propaganda in the media and entertainment industries, anti-Semitism and suppression of ethnic, social and religious minorities, the role of education and youth organizations, as well as the role of women, the churches, and the effects of a controlled economy before and during World War II. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: German Courses Taught in English

GRMN 2501 (3) Miniatures of Modern Life: Introduction to Short Fiction

Introduces students to short fiction from the 20th century. Focuses on issues and themes of modern life, such as: alienation and anxiety; cultures of spectatorship; gender roles, sexuality and social life; memory and nostalgia; technology, industry and capitalism; state power and revolution. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 2502 (3) Representing the Holocaust

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake? Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2502

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 2503 (3) Fairy Tales of Germany

Explores the origins, cultural significance, stylistic and thematic features of the German fairy tale, with emphasis on the Brothers Grimm; on artistic fairy tales by Goethe, Tieck, Brentano, and others; and, on modern retellings in literature and popular culture. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 2601 (3) Kafka and the Kafkaesque

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 2601

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 2603 (3) Moral Dilemmas in Philosophy and Literature

Examines the moral dilemmas that arise when opportunities afforded by basic freedoms or advances in technology clash with the ethical imperatives that issue from the Enlightenment and the social contract. Guiding questions include: When does the quest for knowledge legitimate transgression of prevailing morality? By what standard do we adjudicate the ambitions of the individual when they compete with the interests of the state? Taught in English.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 3010 (3) Advanced German 1

Focuses on cultural topics and reviews grammatical topics, expands vocabulary and provides practice in reading, writing, listening and conversation skills. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 after GRMN 3010. Department enforced prerequisite: four semesters of college German or equivalent. Open to freshmen with instructor consent.

Additional Information: Departmental Category: German

GRMN 3020 (3) Advanced German 2

Expands and refines skills acquired in GRMN 3010. Improves overall fluency and deepens cultural understanding of the German-speaking countries. Develops an advanced skill level in the areas of listening, speaking, reading and writing. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3020. Department enforced prereq., GRMN 3010 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3030 (3) Business German

Introduces students to the language and culture of German business and economic life. Provides insights into everyday business practices and institutions, including Germany's position in the European and world markets. Improves all language skills with an emphasis on Business German. Familiarizes students with current aspects of German society, professional life and business culture. Students will have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3030. Department enforced prereq., GRMN 2020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3110 (3) German Literature from the Avant-garde to the Postmodern

Examines selected literary texts. Emphasizes longer unedited texts as well as critical skills. May be taken either before or after GRMN 3120. Department enforced prereq., GRMN 2020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3120 (3) German Literature from the Enlightenment to Expressionism

Examines selected literary texts of various periods. Emphasizes longer texts and critical skills. May be taken either before or after GRMN 3110. Department enforced prereq., GRMN 2020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3130 (3) Issues in German Philosophy and Literature

Examines selected interdisciplinary texts from the German literary and philosophical tradition. Topics address issues central to philosophical inquiry, and may include knowledge and its limits, mind and body, determinism and free will, reason and religious belief, and ethical problems. Department enforced prereq., GRMN 2020 or 2030 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3140 (3) Current Issues in German Literature

Examines issues pervading contemporary German literature, such as concerns of youth, gender, stereotyping as it affects women and men in their relations with one another, loneliness and sexual frustration, work experiences, and other issues. Department enforced restriction: ability to read unedited German and to speak German.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3150 (3) Issues in German Politics and Literature

Examines literary and theoretical texts in German about the relationship between literature and politics. Topics may include history and revolution, political theater, feminist aesthetics or terrorism. Readings and discussion in German. Department enforced prereq., GRMN 2020 or GRMN 2030 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3501 (3) German-Jewish Writers: From the Enlightenment to the Present

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3501

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: German Courses Taught in English

GRMN 3502 (3) Literature in the Age of Goethe

Features the writings of Germany's major literary figures from 1749 to 1832. Special attention is paid to the formation of literary periods, genres, aesthetic, and socio-historical developments contributing to the birth of modernism in German intellectual history and literature. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 3503 (3) German Film Through World War II

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3503

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3504 (3) Topics in German Film

Analyzes key issues in German culture as they are represented in film and other media, e.g., technology, architecture, women and the Holocaust. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3504 FILM 3504

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3505 (3) The Enlightenment: Tolerance and Emancipation

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3505

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 3506 (3) Tracing the Criminal: Crime in 19th C Society and Culture

Examines cultural and literary representations of crime from the Enlightenment to the early 20th century and contextualizes them within the history of judicial and medical approaches to criminality. Focusing on representations of the criminal as an object of knowledge, this survey of intellectual history introduces students to critical approaches in the humanities and the study of social phenomena in their historical context.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: German Courses Taught in English

GRMN 3513 (3) German Film and Society 1945-1989

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3513

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3514 (3) German Film & Society After 1989

Introduces post-1989 German culture through film. Emphasizes films in their socio-historical contexts and explores developments in German culture during and after the unification. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3514

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3520 (3) Open Topics in the Cultural Context

Examines topics in the cultures of German-speaking central Europe.

Contact the departmental office for specific course offerings. Department enforced prereq., GRMN 3020 (minimum grade C-)

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3601 (3) German Women Writers

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form, and feminism. Visual arts, film, and feminist theory will also be considered in their relation to literature. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3601

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: German Courses Taught in English

GRMN 3702 (3) Dada and Surrealist Literature

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3702

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 3802 (3) Politics and Culture in Berlin 1900-1933

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3802

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: German

GRMN 3930 (1-6) Internship

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) German Studies (GRMN) majors only.

Additional Information: Departmental Category: German

GRMN 4010 (3) Advanced Grammar and Stylistics

Emphasizes idiomatically correct spoken and written German in a variety of genres and culturally relevant contexts. Offers a comprehensive review of the more complex grammatical problems and syntactic structures of the German language. Grammar exercises alternate with readings, discussions and writing on topics related to current cultural, social and political issues in the German-speaking countries. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B2 after GRMN 4010. Department enforced prereq., GRMN 3020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 4051 (3) Critical Theory of the Frankfurt School

Serves as an introduction to the "Frankfurt School" and Critical Theory with particular emphasis upon rationality, social psychology, cultural criticism, and aesthetics. Through close readings of key texts by members of the school (Horkheimer, Benjamin, Adorno, Habermas) we will work toward a critical understanding of the analytical tools they developed and consider their validity. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 5051

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4231 (3) Sex, Love and Marriage in Literature and Philosophy

Traces notions of love, sex and marriage in 19th-20th century philosophy and literature. Considered will be whether/how these representations reflect or challenge ideas of human agency, dignity and happiness. Examined will be shifting views of gender and other social configurations (e.g., friendship, adultery, same-sex desire) to understand their influence on modern attitudes towards sexuality and fidelity.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 5231

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4251 (3) Marxism

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels. Taught in English. Department enforced prerequisite: 12 hours of GRMN or PHIL course work or instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4250

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4253 (3) Philosophy of Language

Surveys seminal essays from Frege to the present on the philosophy of language. Taught in English.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4301 (3) Gender, Race and Immigration in Germany and Europe

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation, and sexuality. Texts may include film, literature, television, magazine images, etc. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4301 and GRMN 5301

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: German Courses Taught in English

GRMN 4330 (3) The Age of Goethe

German literature from 1770 to 1830. Close examination of representative texts from the periods of Sturm und Drang, classicism, and romanticism. Emphasizes philosophical and social background. Department enforced prereq., GRMN 3020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 4340 (3) Seminar in German Literature

Intensive study of a particular literary period, author, or genre. Secondary sources are used. Course content differs each time. Department enforced prereq., GRMN 3020 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 4450 (3) Methods of Teaching German

Required of students who desire the recommendation of the department for secondary school teaching positions. For student teaching in German, see EDUC 4712 under the School of Education.

Requisites: Restricted to School of Education (EDUC) undergraduates only

Additional Information: Departmental Category: German

GRMN 4460 (6) High School German Teaching

Part of the supervised student teaching in a secondary school required for state certification to teach German.

Requisites: Restricted to School of Education (EDUC) undergraduates only

Grading Basis: Pass/Fail

Additional Information: Departmental Category: German

GRMN 4501 (3) Seminar: Literature in Cultural Context

Provides a broader basis for the work of literature, viewing it from various cultural perspectives. Specific content of course is defined by the instructor. Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4502 (3) Nietzsche: Literature and Values

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4502

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 4503 (3) Issues in German Thought

Provides the opportunity to examine major issues in German philosophical, social, and religious thought from the end of German idealism to existentialism and critical theory. Emphasizes the relationship between ideas and social and political action. Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4504 (3) Goethe's Faust

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 5504 and HUMN 4504

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 4550 (3) Senior Seminar: The Roles of Intellectuals and Academics in German Culture

Examines the articulation of the German bourgeoisie during critical periods in German history. Looks at specific groups and their participation in German public culture, e.g., writers, artists, journalists, academics, and political figures. Students work closely with a faculty advisor during the semester and are expected to produce a major research paper. Department enforced prereq., GRMN 3020 (minimum grade C-).

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) German (GRMN) or School of Education (EDUC) majors only.

Additional Information: Departmental Category: German

GRMN 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: German

GSLI 2350 (3) Introduction to Jewish Culture

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2350

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Germanic and Slavic Courses

GSLI 2401 (3) The German Experience in North America

Discusses the history, culture and literature of German immigrants from the 17th to the 21st century. Investigates reasons for migration and the Diaspora of Germans in Russia to the United States and Canada. Studies individual settlements and stores of German pioneer authors and introduces course participants to archival research.

Additional Information: Departmental Category: German Courses Taught in English

GSLI 2551 (3) Modern Jewish Literature

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly HEBR 2551.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2551

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Germanic and Slavic Courses

GSLI 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the "Cold War." Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3401

Additional Information: Departmental Category: Germanic and Slavic Courses

GSLI 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3600 and IAFS 3600

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Germanic and Slavic Courses

NORW 1010 (4) Beginning Norwegian 1

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Norwegian

NORW 1020 (4) Beginning Norwegian 2

Department enforced prerequisite: NORW 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Norwegian

NORW 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Norwegian

NORW 2110 (4) Second-Year Norwegian Reading and Conversation 1

Department enforced prerequisite: NORW 1020 (minimum grade C-).

Fulfills the arts and sciences language requirement for the BA and BFA degrees.

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Norwegian

NORW 2120 (4) Second-Year Norwegian Reading and Conversation 2

Continuation of NORW 2110, with focus on Norwegian culture and society. Small group work and class discussions. Department enforced prerequisite: NORW 2110 (minimum grade C-).

Additional Information: Departmental Category: Norwegian

NORW 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Norwegian

RUSS 1010 (4) Beginning Russian 1

For students with no previous training in Russian.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 1050

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Russian

RUSS 1020 (4) Beginning Russian 2

Continuation of RUSS 1010. Department enforced prerequisite: RUSS 1010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 1050

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Russian

RUSS 1050 (5) Intensive Beginning Russian

Covers same material as RUSS 1010 and RUSS 1020 combined in one course. Focuses on acquiring basic grammar (all cases for nouns, adjectives and possessives, verb conjugations, in all three tenses), and ability to understand and speak basic everyday Russian. Develops basic reading and writing skills and provides exposure to the fundamentals of the Russian culture.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 1010 or RUSS 1020

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Russian

RUSS 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Russian

RUSS 2010 (4) Second-Year Russian 1

Review and continuation of basic skills learned in the first year: reading, writing, speaking, and oral comprehension. Department enforced prerequisite: RUSS 1020 or RUSS 1050 (minimum grade C-). Satisfies arts and sciences language requirement.

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Russian

RUSS 2020 (4) Second-Year Russian 2

Continuation of RUSS 2010. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

Additional Information: Departmental Category: Russian

RUSS 2211 (3) Introduction to Russian Culture

Provides a chronological overview of civilization in the area now known as Russia, from its beginnings to the end of the Romanov dynasty, paying particular attention to the geographic, social, artistic, economic, and political forces that have combined to give the Russian people and their culture their unique characteristics. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Russian Courses Taught in English

RUSS 2221 (3) Introduction to Modern Russian Culture

Introduces students to major trends in Russian culture from the 1890's to the present, through the study of literature, art, architecture, music and film in an historical context. Addresses such questions as: how have past events affected Russian society? How can we use knowledge about Russia's past to understand social and cultural forces today? Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: LIBB 2100

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Russian Courses Taught in English

RUSS 2222 (3) Sports and the Cold War

Explores the multiple connections between sports and international politics during the Cold War in the Post-War period. Examines how the issues of class, nation, ethnicity, and gender intersect with sports and international politics by studying cases from various sport events since 1945.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Russian

RUSS 2231 (3) Fairy Tales of Russia

Provides a general introduction to fairy tales including various theoretical approaches to classifying and interpreting them; introduces students to a wide selection of Russian folk and fairy tales. Examines the cultural, social and political values they reflect, as well as the continuing influence of fairy tales and folk beliefs in Russian literature, music, folk art, and film, and in the political propaganda of the 20th century. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Literature and the Arts

Departmental Category: Russian Courses Taught in English

RUSS 2241 (3) The Vampire in Literature and the Visual Arts

Introduces students to the folkloric and historic origins of the vampire of contemporary culture. Students will read both Russian and Western literary works, analyzing the image of the vampire as represented in folk narrative, popular fiction and film. Students will learn to apply critical approaches to understanding the vampire metaphorically, symbolically and as a demonized "other". Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Russian Courses Taught in English

RUSS 2251 (3) Knights and Amazons: Superheroes in Russian Epics and Film

Immerses students in the mythological past of medieval Russia and introduces them to the legendary warrior heroes and heroines through epic narratives, fairy tales, literature, art, film and animation. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 2261 (3) The Russian Short Story

Introduces students to the short story as a unique literary form, emphasizing the significant contributions of Russian writers to both the short story genre and its criticism. Familiarizes students with various styles and subgenres of the short story, including the romantic, psychological, and supernatural tale, and allegorical and satirical tale. A good introduction to further literary or Russian studies. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 2471 (3) Women in Russian Culture: From Folklore to the Nineteenth Century

Explores the changing role and cultural images of women as reflected in Russian folklore, historical documents, costumes, icons, paintings and literature from medieval times to 19th century. Focuses on the way Russian women have transgressed boundaries of patriarchy and secured powerful positions in society and culture. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Historical Context

Departmental Category: Russian Courses Taught in English

RUSS 2501 (3) Russia Today

Introduces students to post-communist Russia, its politics, values and ideologies. Neither totalitarian nor liberal, contemporary Russia raises numerous questions about such ideological and cultural constructions as neo-liberalism and capitalism, nationalism, globalization, state power and popular vs. high cultures. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Russian Courses Taught in English

RUSS 3000 (3) Advanced Conversation

Enables students to speak and understand contemporary Russian. Discussion topics and source materials vary. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 3010 (4) Third-Year Russian I

Review of Russian grammar coordinated with reading, speaking, writing and understanding modern Russian. Uses some texts from modern Russian literature. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

Additional Information: Departmental Category: Russian

RUSS 3020 (4) Third-Year Russian II

Continuation of RUSS 3010. Department enforced prerequisite: RUSS 3010 (minimum grade C-).

Additional Information: Departmental Category: Russian

RUSS 3060 (4) Advanced Russian for Heritage Speakers (Part 1)

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4010 or RUSS 5010

Additional Information: Departmental Category: Russian

RUSS 3211 (3) History of Russian Cinema

Surveys Russian cinema in historical and cultural context from early 20th century to the present. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3211

Recommended: Prerequisite RUSS 2221 or FILM 1502.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 3231 (3) Laughter in Slavic Cultures

Examines forms, genres and social functions of laughter in Slavic cultures (Russian, Polish, Czech, Serbian and others) and provides an introduction to literature and film of Eastern Europe. All readings are in English. Taught in English.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 3241 (3) Red Star Trek: Russian Science Fiction Between Utopia and Dystopia

Examines Russo-Soviet science fiction in literature and film. Within this popular genre, writers conceive and criticize social utopias, thus creating works situated between the poles of utopia and dystopia. Through discussions of Soviet and post-Soviet science fiction the course introduces a Russo-Soviet "alternative modernity" and studies its historical development. All readings are in English. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 3301 (3) Contemporary Issues in Russian Film

Examines the representation of contemporary Russian society in noteworthy Russian films of the last 20 years. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3301

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 3333 (3) Spies Like Us: Espionage in the Culture of the Cold War and Beyond

Explores the figure of the spy in Western and Soviet/post-Soviet imagination of the Cold War period and after. Focuses on the constructions and transformations of the "enemy" concept in modern and post-modern societies.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Russian Courses Taught in English

RUSS 3601 (3) Russian Culture Past and Present

Russian culture from the ninth century to the present. Focuses on interdisciplinary exploration of literature, folklore, art, architecture and music through study in St. Petersburg. Offered abroad only.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian Courses Taught in English

RUSS 3701 (3) Slavic Folk Culture: Ideals and Values in the Contemporary World

Explores contemporary Slavic and American folk practices and investigates the possible origins and consequences of such practices. Focuses upon the value systems these practices represent, and ways that core values help to define identities and cultures. Topics include folk religion, magic, healing, life cycle and calendar rituals and folk music. Taught in English.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Russian Courses Taught in English

RUSS 3705 (3) Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia

Examines the historical evolution of gender and sexual politics and the status of women in the late Imperial Russian culture, with particular attention to the writings of Leo Tolstoy and his masterpiece *Anna Karenina*. Topics-based survey considers debates around marriage, sexuality and gender equality through analysis of primary text by Tolstoy and his contemporaries, as well as secondary materials in gender studies, literary criticism and intellectual history.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Russian Courses Taught in English

RUSS 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Russian

RUSS 3930 (1-6) Russian Internship

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Russian (RUSS) majors only.

Additional Information: Departmental Category: Russian

RUSS 4010 (4) Advanced Conversation and Composition 1

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 3020 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 3060 RUSS 5010

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 4020 (4) Advanced Conversation and Composition 2

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 4010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4060 RUSS 5020

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 4050 (3) Professional Russian

Introduces stylistic and idiomatic forms of Russian used in business, politics, media and the Internet. Develops new vocabulary with a special focus on fluency of speech and written communication skills. Offers immersion into the world of contemporary Russian media, politics and culture. Formerly RUSS 3050.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5050

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite RUSS 3020.

Additional Information: Departmental Category: Russian

RUSS 4060 (4) Advanced Russian for Heritage Speakers (Part 2)

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia. Department enforced prerequisite: RUSS 3060 or RUSS 4010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4020 or RUSS 5020

Additional Information: Departmental Category: Russian

RUSS 4120 (3) Russia after Communism: Post-Soviet Politics and Culture

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5120

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4210 (3) Topics in Russian Culture

Selected topics in Russian literature, film, art and music. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5210

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4221 (3) Stalinism: Society and Culture

Examines Soviet society and culture of Stalin period (1929-1953). The Great Terror, communist ideology, shady, commercial practice, political intrigues and show trials, as well as many other aspects of Stalinism will be discussed. Course materials include historical studies, documents, memoirs, diaries, novels and films of or about the period. Taught in English.

Additional Information: Arts Sci Core Curr: Ideals and Values

Departmental Category: Russian Courses Taught in English

RUSS 4230 (3) Russian Cultural Idioms

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5230

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 4301 (3) American-Russian Cultural Relations

Surveys the development of American-Russian cultural relations from the second half of the 18th century to the present. Examines the character and significance of Russian-American relations in social, intellectual, artistic, and other spheres from a comparative perspective. Taught in English. S. context.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Historical Context
Arts Sci Core Curr: United States Context
Departmental Category: Russian Courses Taught in English

RUSS 4401 (3) The Russian Jewish Experience

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5401 and JWST 4401

Recommended: Prerequisite any 1000 or 2000-level undergraduate literature course.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 4431 (3) Dostoevsky

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5431

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4441 (3) Tolstoy

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5441

Recommended: Prerequisite lower division literature course.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4451 (3) Chekhov

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5451

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4471 (3) Women in 20th-21st Century Russian Culture

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4471 and RUSS 5471

Recommended: Prerequisite lower level literature or culture course.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Russian Courses Taught in English

RUSS 4481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5481 and IAFS 3621

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian Courses Taught in English

RUSS 4811 (3) 19th Century Russian Literature

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4811

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 4821 (3) 20th Century Russian Literature and Art

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4821

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 4831 (3) Contemporary Russian Literature

Acquaints students with the most representative works of Russian writers after the collapse of the Soviet regime. Examines the relationships between ideological concepts and aesthetics, and the treatment of moral and social issues in recent literary works. All readings are provided in translation. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Arts Sci Core Curr: Contemporary Societies

Departmental Category: Russian Courses Taught in English

RUSS 4841 (3) History of Modern Russian Drama

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5841

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4851 (3) Critical Thinking: Russian Film and Society

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5851

Recommended: Prerequisite RUSS 2221 or RUSS 3301 or FILM 3301.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4861 (3) Absurd and Supernatural in Russian Literature

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharmis, Bulgakov, Siniavskii, Petrushevskaiia and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5861

Recommended: Prerequisite one lower level literature or culture course.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Russian

SCAN 1202 (3) Tolkien's Nordic Sources and the Lord of the Rings

Examines the Nordic aspect of J.R.R. Tolkien's work, especially *The Lord of the Rings*. Concentrates on the Nordic saga tradition, mythology, folklore and fairy tales Tolkien used as his sources. Students will explore the transformations of these sources from prehistoric times to contemporary cinematic adaptations, while paying special attention to cultural appropriations, national revisions and political alterations. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 2201 (3) Introduction to Modern Nordic Culture and Society

Provides a comprehensive introduction to modern Nordic culture and society. Surveys the history of Nordic countries and examines their culture using art, architecture, literature, and film. Studies social issues, environmental concerns, and political patterns. In profiling aspects of culture and society unique to Nordic countries, students arrive at a conception of a collective Nordic identity. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Nordic Studies Courses Taught in English

SCAN 2202 (3) The Vikings

Examines the social, cultural, technological, and artistic backgrounds of the Viking experience, charting the history of the period both within the Nordic region and Europe as well as North America. Additionally, looks at some of the lasting influences of the Vikings on Western civilization. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Nordic Studies Courses Taught in English

SCAN 2900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3020 (3) Advanced Readings in Scandinavian

Develops the type of advanced reading knowledge of the four closely related Scandinavian languages (Swedish, Danish and the two Norwegian standards) that will prepare students for their senior thesis and for possible graduate work. Readings will help students see relationships and connections operating across national and linguistic borders within the Nordic region. Department enforced prerequisites: NORW 2120 and NORW 3900 or SWED 3900 (all minimum grade C-).

Additional Information: Departmental Category: Norwegian
Departmental Category: Swedish

SCAN 3110 (3) Topics in Contemporary Nordic Society and Culture

Provides insight into cultural adaptations, political struggles and social transformations taking place in the contemporary Nordic world. Subjects treated vary according to current developments in the region, student interest and faculty availability.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3201 (3) Contemporary Nordic Society and Culture

Explores contemporary Nordic culture and society with special focus on Iceland. Emphasis is on the relationship between historical, geographic, artistic, and political forces in Iceland and their effects on culture and society. Provides insight into the life and attitudes of contemporary Icelanders and stresses their place in the global culture of today. Taught in English.

Recommended: Prerequisite SCAN 2201.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3202 (3) Old Norse Mythology

Surveys the mythology and heathen cult practices of the Old Norse world. Students learn to read mythological texts and study the major gods (Odin, Thor, Frey and Freyja, among others), along with other mythological beings. Examines and evaluates evidence for beliefs and cult practices in texts, art, archeological finds and other sources. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3203 (3) 19th & 20th Century Nordic Literature

Examines the Nordic region's influence on social realism, expressionism, and postwar literature, including such themes as women in society, nature and industrialization, and identity and angst. May include works by Ibsen, Strindberg, Dinesen, and Nobel Prize winners Lagerlof, Hamsun, Undset, and Lagerkvist. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3204 (3) Medieval Icelandic Sagas

Advanced introduction to medieval Icelandic saga with readings in the family, outlaw, skald, and legendary sagas as well as the main scholarly approaches to this unique literature. Topics include honor, blood feud, fate, sexuality/gender, oral composition, and legend. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3205 (3) Scandinavian Folk Narrative

Introduces the rich tradition of Scandinavian oral narrative. Looks at relationships between the various genres of oral narrative and their historical, social, and cultural contexts. Genres studied may include ballad, fairy tale, rural legend, and urban legend. Explores various interpretive methodologies. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3206 (3) Nordic Colonialisms

Examines Nordic colonial enterprise and the relationship between the Scandinavian center and colonial peripheries from the Arctic to the Caribbean, Africa, and India. Studies colonial and postcolonial cultures, and postcolonial criticism and theory. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3208 (3) Women in Nordic Society: Modern States of Welfare

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3208
Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3209 (3) Contemporary Nordic Literature and Film

Advanced introduction to contemporary Nordic literature and film. Readings/screenings of recent translated Nordic texts and films, presenting a broad spectrum of contemporary issues, along with current critique and theoretical approaches. Topics: history, culture, translation, gender/sexuality, national identity, minority issues, etc. Taught in English.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3301 (3) Radical Nationalism in Contemporary Northern Europe

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3630
Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3506 (3) Scandinavian Drama

Examines the many contributions of Scandinavian dramatists to world theater from the 18th century to the present. With emphasis on Holberg, Bjornson, Ibsen, Strindberg, and Bjorneboe, surveys Enlightenment comedy, national romanticism, realism, naturalism, symbolism, expressionism, and Brechtian epic theater. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3631 (3) Arctic Society and Culture

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3631
Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SWED 1010 (4) Beginning Swedish 1

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1020 (4) Beginning Swedish 2

Department enforced prerequisite: SWED 1010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SWED 1120

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1110 (4) Beginning Swedish 1 - Directed Independent Language Study

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1120 (4) Beginning Swedish 2 - DILS

Continuation of SWED 1110 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1110 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SWED 1020

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Swedish

SWED 2010 (4) Intermediate Swedish 1 -DILS

Continuation of SWED 1120 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1120 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 2020 (4) Intermediate Swedish 2 - DILS

Develops intermediate reading, writing, speaking and verbal comprehension skills. Uses the Directed Independent Language Study (DILS) model that combines in-class exercises and lectures with independent study. Reviews and continues content of SWED 2010. Directed independent language study course requires work outside of class. Department enforced prerequisite: SWED 2010 (minimum grade C-).

Additional Information: Departmental Category: Swedish

SWED 3010 (3) Advanced Swedish 1-DILS

Continuation of Intermediate Swedish 2. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 2020 - DILS (minimum grade C-).

Additional Information: Departmental Category: Swedish

SWED 3020 (3) Advanced Swedish 2 - DILS

Continuation of Advanced Swedish 1. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 3010 - DILS (minimum grade C-).

Additional Information: Departmental Category: Swedish

SWED 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Swedish

German Studies - Bachelor of Arts (BA)

The major in German studies is an interdisciplinary program focusing on study of the German language, its manifestations in history and its usage in the current cultural and social context; the literary, artistic and philosophical aspects of German culture in the past and the present; the major historical events and developments in Germany and its neighboring countries, and the current political institutions and dynamics in Germany within the broader European framework.

The following areas of knowledge are central to the undergraduate degree in German Studies:

- an awareness of the fundamental outlines of German history and culture;
- familiarity with the history of modern German literature from 1750 to the present;
- familiarity with developments in modern German-speaking Central Europe in art, cinema, architecture, law, science, and technology and
- the ability to critically examine such issues as the Nazi era and the Holocaust, migration, gender, disability, racial and ethnic difference, and Germany's place in the European Union.

In addition, students completing the degree in German Studies are expected to acquire:

- the ability to read German at a level at which critical literary and cultural analyses can be performed;
- the ability to write and speak German sufficiently to participate in critical discussions and write critical essays;
- the ability to speak and comprehend German well enough to participate in all situations in daily life, including cultural, educational, business, and professional sectors of German life.

Study Abroad

The department strongly recommends that all majors take part in study abroad. The university offers study abroad programs in Regensburg (academic year or spring semester) and Berlin (academic year or summer semester). Please consult with the major advisor. For more information on study abroad programs, see studyabroad.colorado.edu (<http://studyabroad.colorado.edu>).

Concurrent Degree Program BA/MA in German Studies

The concurrent BA/MA degree in German Studies recognizes the need for master's-level training upon entering the job market in a variety of

sectors that call for highly advanced proficiency in the German language, knowledge of the German-speaking central Europe and its cultures, and the skills afforded to BA and MA graduates in the Humanities (research, analysis, interpretation, translation, communication).

The degree gives highly motivated BA students the opportunity to earn an MA degree using an accelerated undergraduate program in combination with a fifth year of study. Applications can be obtained in the Germanic and Slavic office (McKenna 129). It is recommended that applications be turned in by the spring semester of the sophomore year.

Students must have an overall 3.25 GPA to apply to the program, and should have completed most of their MAPS/core requirements by the end of their sophomore year. No GRE is required.

For more information, see www.colorado.edu/gssl/german/undergraduate/concurrent-bama-degree-german-studies. (<http://www.colorado.edu/gssl/german/undergraduate/concurrent-bama-degree-german-studies>)

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

The major requirement in German Studies is 32 hours beyond GRMN 1020 (with grades of C- or above). Students design their own major in consultation with the undergraduate advisor and a faculty mentor. At least 18 hours taken toward the major must be completed at the 3000 or 4000 level. **GRMN 4550 MUST BE TAKEN AT CU BOULDER.**

Required Courses and Credit Hours

German Language Courses 14-17

14-17 credit hours above 1020, must include either GRMN 3020 or GRMN 3030, may include both GRMN 3020 and GRMN 3030

GRMN 2010	Intermediate German 1
GRMN 2020	Intermediate German 2 or GRMN 20: Intensive Intermediate German
GRMN 3010	Advanced German 1
GRMN 3020	Advanced German 2 ¹
GRMN 3030	Business German
GRMN 4010	Advanced Grammar and Stylistics ¹

German Culture, Literature and Other Electives (15-18 credit hours) 15-18

GRMN 4550	Senior Seminar: The Roles of Intellectuals and Academics in German Culture (required and must be taken at CU Boulder)
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Take at least four German literature/culture courses from Group I and II (five if taking 14 language credits in Section A). At least two courses must be upper-division, and at least two must be in German: ²

Group I - Courses Taught in German:	
GRMN 3110	German Literature from the Avant-garde to the Postmodern
GRMN 3120	German Literature from the Enlightenment to Expressionism
GRMN 3130	Issues in German Philosophy and Literature
GRMN 3140	Current Issues in German Literature
GRMN 3150	Issues in German Politics and Literature
GRMN 3520	Open Topics in the Cultural Context
GRMN 3900	Independent Study

GRMN 3930	Internship
GRMN 4330	The Age of Goethe
GRMN 4340	Seminar in German Literature
GRMN 4450	Methods of Teaching German
Group II - Courses Taught in English:	
GRMN 1601	Germany Today (core: contemporary societies)
GRMN 1602	Metropolis and Modernity (core: literature and the arts)
GRMN 1701	Nature and Environment in German Literature and Thought (core: ideals and values)
GRMN 2301	Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich (core: historical context)
GRMN 2501	Miniatures of Modern Life: Introduction to Short Fiction (core: literature and the arts)
GRMN 2502	Representing the Holocaust (core: ideals and values)
GRMN 2503	Fairy Tales of Germany (core: literature and the arts)
GRMN 2601	Kafka and the Kafkaesque (core: literature and the arts)
GRMN 2603	Moral Dilemmas in Philosophy and Literature (core: ideals and values)
GRMN 3501	German-Jewish Writers: From the Enlightenment to the Present (core: human diversity)
GRMN 3502	Literature in the Age of Goethe (core: literature and the arts)
GRMN 3503	German Film Through World War II
GRMN 3504	Topics in German Film
GRMN 3505	The Enlightenment: Tolerance and Emancipation (core: ideals and values)
GRMN 3506	Tracing the Criminal: Crime in 19th C Society and Culture (core: historical context)
GRMN 3513	German Film and Society 1945-1989
GRMN 3514	German Film & Society After 1989
GRMN 3601	German Women Writers (core: human diversity)
GRMN 3702	Dada and Surrealist Literature (core: literature and the arts)
GRMN 4231	Sex, Love and Marriage in Literature and Philosophy
GRMN 4251	Marxism
GRMN 4253	Philosophy of Language
GRMN 4301	Gender, Race and Immigration in Germany and Europe (core: human diversity)
GRMN 4501	Seminar: Literature in Cultural Context
GRMN 4502	Nietzsche: Literature and Values (core: ideals and values)
GRMN 4503	Issues in German Thought
GRMN 4504	Goethe's Faust (core: literature and the arts)
JWST 4544	History of Yiddish Culture

Secondary Teacher Certification Program

Required for Students in the Secondary Teacher Certification Program:

GRMN 4450	Methods of Teaching German ³
GRMN 4460	High School German Teaching ³

Plus other requirements as stated by the School of Education

Total Credit Hours	32-35
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- Students have the option of taking the exam *Zertifikat Deutsch als Fremdsprache* in GRMN 3020 and the Goethe-Zertifikat C1 in GRMN 4010.
- With the approval of the German program faculty advisor, one course from another department may be taken in lieu of one of the four courses, provided that the course has a direct link to German studies.
- GRMN 4450 and GRMN 4460 can be taken only after full admission to the teacher education program in the School of Education.

Study Abroad

The department recommends that all majors take part in study abroad. The university's program in Regensburg provides an academic year and spring semester study abroad program. The Berlin program offers an academic year and a summer study abroad opportunity. Please consult with a faculty advisor and visit the study abroad website at studyabroad.colorado.edu (<http://studyabroad.colorado.edu>) for program-specific information. Scholarships are available to help cover the costs of study abroad.

Graduating in Four Years

Course	Title	Credit Hours
Year One		
During the first year, students typically take GRMN 1010 and GRMN 1020 (8 credit hours) or GRMN 1030 (5 credit hours) which does not count toward their majors ³		
One lower level literature or culture course		3
	Credit Hours	3
Year Two		
GRMN 2010 & GRMN 2020 or GRMN 2030	Intermediate German 1, 2, 3 or Intensive Intermed German	5-8
One lower level literature or culture course		3
	Credit Hours	8-11
Year Three		
Study Abroad recommended		
GRMN 3010 & GRMN 3020 or GRMN 3030	Advanced German 1 or Business German	5-6
Upper level literature or culture course taught in German or English		3
	Credit Hours	8-9
Year Four		
GRMN 4550	Senior Seminar: The Roles of Intellectuals and Academics in German Culture	3

Two upper level literature or culture courses taught in German	6
Credit Hours	9
Total Credit Hours	28-32

- ¹ or placement credit - Students who place out of beginning and intermediate language requirements should see the Major requirements for further flexible options
- ² or placement credit - Students who place out of beginning and intermediate language requirements should see the Major requirements for further flexible options
- ³ Students who take intensive language courses (GRMN 1030 or GRMN 2030) may fulfill their additional language credits with GRMN 3030 or GRMN 4010.

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in German or Russian studies, students should meet the following requirements:

- Begin to study the language in the freshman year, or have received AP credit.
- In consultation with the major program advisor before the end of the drop/add period in the first semester, plan a tentative schedule of courses to be taken over eight semesters.
- Discuss progress toward the degree each semester with the major advisor.

Note: Although these requirements apply only in cases in which students are seeking to graduate under the terms of the four-year guarantee, they are good advice for all majors. Consult the program advisor about the major at any time.

German Studies - Minor

In German Studies, we focus on all areas of German culture and its crucial role in the formation of the modern world. A minor is offered in German Studies. Declaration of a minor is open to any student enrolled at CU-Boulder, regardless of college or school. A&S Policy on Enrollment in Undergraduate Language Courses (<http://www.colorado.edu/gsl/policy-enrollment-undergraduate-language-courses>)

Requirements

The requirements for a minor in German Studies are 20 hours (with grades of C- or above).

Required Courses and Credit Hours

GRMN 2010 & GRMN 2020 or GRMN 2030	Intermediate German 1 and Intermediate German 2 or Intensive Intermediate German	5-8
Students who take GRMN 2030 cannot also receive credit for GRMN 2010 and GRMN 2020, and must take one additional 3 credit GRMN course toward the minor, such that the total number of credits for the minor equals 20.		
GRMN 1601	Germany Today (core course)	3
GRMN 3010	Advanced German 1 (or any 3000-4000 level German literature, film, or culture course taught in German or English)	3

GRMN 3020	Advanced German 2 (or any 3000-4000 level GRMN literature, film, or culture course taught in German or English) ² or GRMN 3030 Business German	3
	One 3000-4000 level GRMN literature, film, or culture course taught in German	3
Students may not apply more than 9 hours of transfer credit (including 6 upper division credits) towards the minor. Transfer courses must be approved by the department.		
Total Credit Hours		20

NOTE: Students may not apply more than 9 hours of transfer credit (including 6 upper division credits) towards the minor. Transfer courses must be approved by the department.

NOTE: Students have the option of taking the exam *Zertifikat Deutsch als Fremdsprache* in GRMN 3020.

Nordic Studies - Minor

Courses are offered in English on Nordic culture and civilization. Courses are also offered in Finnish, Swedish and Danish language. In addition, there is an exchange program with Uppsala University in Sweden and with the University of Copenhagen in Denmark (DIS).

The language courses satisfy College of Arts and Sciences language requirements for the BA and BFA degrees.

Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

To declare a minor in Nordic Studies please meet with Christine Luft (christine.luft@colorado.edu) to start your application.

A minor in Nordic Studies requires the completion of 18 credit hours. A minimum of 9 credit hours must be taken in upper division courses. All courses used to fulfill requirements for the minor must receive a grade of C- or better; none may be taken pass/fail.

Required Courses and Semester Credit Hours

Language, Culture and Society		9
Select three of the following:		
SWED 2020	Intermediate Swedish 2 - DILS	
DANE 2020	Intermediate Danish II - DILS	
FINN 2020	Intermediate Finnish 2 - DILS	
NORW 2120	Second-Year Norwegian Reading and Conversation ^{2 1}	
NORW/SWED/SCAN 3900	Independent Study	
SCAN 2201	Introduction to Modern Nordic Culture and Society (core: contemporary societies)	
SCAN 2202	The Vikings (core: historical context)	
SCAN 3201	Contemporary Nordic Society and Culture (core: contemporary societies)	
SCAN 3206	Nordic Colonialisms (core: human diversity) ²	
SCAN 3208	Women in Nordic Society: Modern States of Welfare (core: human diversity) ²	
SCAN 3209	Contemporary Nordic Literature and Film	

SCAN 3301	Radical Nationalism in Contemporary Northern Europe (core: ideals and values)	
Literature		
Select three of the following:		9
SCAN 1202	Tolkien's Nordic Sources and the Lord of the Rings (core: literature and the arts)	
SCAN 3202	Old Norse Mythology (core: literature and the arts)	
SCAN 3203	19th & 20th Century Nordic Literature (core: literature and the arts)	
SCAN 3204	Medieval Icelandic Sagas (core: literature and the arts)	
SCAN 3205	Scandinavian Folk Narrative (core: literature and the arts)	
SCAN 3506	Scandinavian Drama (core: human diversity) ²	
SCAN 3208	Women in Nordic Society: Modern States of Welfare (core: human diversity) ²	
SCAN 3209	Contemporary Nordic Literature and Film ²	
SCAN 3506	Scandinavian Drama (core: literature and the arts)	
SCAN 2900	Independent Study	
SCAN 3900	Independent Study	
Total Credit Hours		18

¹ NORW 2120 and NORW 3900 are not currently being offered by GSLL. SWED 1110, SWED 1120, SWED 2010 and SWED 2020 are currently being offered by GSLL.

² SCAN 3206, SCAN 3208 and SCAN 3209, may be counted either toward Language, Culture and Society or toward Literature, but not both.

Russian Studies - Bachelor of Arts (BA)

The major in Russian studies is an interdisciplinary program focusing on study of the current cultural and social context, and the literary, artistic, and historical aspects of Russian culture in the past and present. The aim of the language curriculum is to equip students to read, write, speak and understand Russian on a level allowing communication with natives and other users of the language. Before registering for a course, students should consult with a departmental advisor concerning appropriate placement.

Students interested in Russian studies should consider a double major in order to increase their career opportunities. Prospective teachers might combine Russian studies with a major in another foreign language, while those preparing for a career in government, business or social services should benefit from a combination of Russian studies and a social science or business major. Students structure their curriculum according to the departmental checklist for majors, in close consultation with a departmental advisor.

The following areas are central to the undergraduate degree in Russian:

- an awareness of the fundamental outlines of the history of Russian literature and culture from the Middle Ages to the present day;
- familiarity with the major Russian creative writers of the nineteenth and twentieth centuries;
- familiarity with the historical context of Russian literature and culture;

- an awareness of basic critical methodologies as they relate to the study of Russian literature.

In addition, students with a degree in Russian are expected to acquire:

- the ability to comprehend contemporary Russian, written or spoken, to a degree permitting sophisticated analysis of cultural texts;
- the ability to analyze Russian literary texts and give a reasoned response to them in literate English;
- the ability to write and converse in Russian at their own intellectual level.

Study Abroad

The department strongly recommends that all Russian majors take part in the university summer language program in St. Petersburg. For more information on CU Study Abroad programs, see studyabroad.colorado.edu (<http://studyabroad.colorado.edu>).

Courses Taught in English

A number of courses are offered in translation. These courses generally require no previous study in the language, history or culture of the area involved, and are open to all interested students, regardless of major.

Concurrent Degree Program

BA/MA in Russian Studies

Highly motivated undergraduates majoring in Russian studies at CU Boulder have the opportunity to enter a BA/MA program, thereby earning both the BA and the MA in five years. The concurrent degree program offers a unique academic credential designed to produce skilled graduates for a variety of occupations.

In most cases, students must make written application no later than April 1 of the sophomore year. A minimum GPA of 3.00 for all Russian Studies courses is required, as well as two letters of recommendation indicating strong potential for advanced, intensive work in Russian. BA/MA students are expected to take graduate courses in the fourth and fifth years only. Students should have completed most of their MAPS/ Core requirements by the end of the sophomore year. Only CU Boulder students may apply.

For more information, see www.colorado.edu/gsll/russian/undergraduate/concurrent-bama-degree-russian-studies (<http://www.colorado.edu/gsll/russian/undergraduate/concurrent-bama-degree-russian-studies>).

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

- Completion of at least 30 credit hours with grades of C- or better. (None may be taken as pass/fail.) At least 18 RUSS credit hours must be completed at the 3000 or 4000 level.
- Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060. Choose either the RUSS 3060, RUSS 4060 sequence OR the RUSS 4010, RUSS 4020 sequence.
- Students are required to structure their curriculum for the major in close consultation with a departmental advisor. Students with advanced Russian language skills are strongly encouraged to meet with a departmental faculty advisor to discuss language placement.

Students who have Russian language transfer credit and/or students who are Russian language native or heritage speakers may enter the program at the upper-division level, up to RUSS 4010, with faculty permission.

- In the case of advanced language placement, students will be required to meet with the Russian faculty advisor for Russian course substitutions and recommendations. Students who place out of Russian language courses required for the major must replace the credits with additional coursework in Russian Studies. Any substitutions to major coursework must be pre-approved by the Russian faculty advisor.
- Graduating Russian Studies majors are asked to participate in an annual assessment exercise during their last (spring) semester at the university. We ask you to take the language and literature-culture exams to help evaluate the quality of the Russian Studies major. (You may also be interested in learning your level of language competence from the standardized online test.) You cannot study for the exams and they do not affect your course grades or graduation in any way.

NOTE: RUSS 1010 and RUSS 1020 do NOT count toward the 30 credit hours required for the major in Russian Studies.

NOTE: Study abroad is recommended after the second year of language study.

NOTE: Beginning or middle-level language course requirements may be met by transfer credit or by testing out of the course. Students who enter the program at the third-year level must complete at least 18 credit hours in residence in courses numbered 3000 or above with grades of C- or better. (None may be taken pass/fail.) Students who enter at and enroll in Russian language courses at the 3000- or 4000-level may not receive credit for lower-division Russian language courses, unless lower-division language course work was completed prior to registration for 3000- and 4000-level Russian language courses. Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060.

Required Courses and Credit Hours

Track A: Russian Language and Culture

Required Russian Language	16
RUSS 2010 Second-Year Russian 1	
RUSS 2020 Second-Year Russian 2	
RUSS 3010 Third-Year Russian I	
RUSS 3020 Third-Year Russian II	
One of the following (19th century and earlier periods)	3
RUSS 2211 Introduction to Russian Culture	
RUSS 2261 The Russian Short Story	
RUSS 2471 Women in Russian Culture: From Folklore to the Nineteenth Century	
RUSS 3601 Russian Culture Past and Present	
RUSS 4481 Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4811 19th Century Russian Literature	
RUSS 4821 20th Century Russian Literature and Art	
RUSS 4861 Absurd and Supernatural in Russian Literature	
Select one of the following (20th and 21st centuries)	3
RUSS 2221 Introduction to Modern Russian Culture	
RUSS 2261 The Russian Short Story	
RUSS 3211 History of Russian Cinema	

RUSS 3601 Russian Culture Past and Present	
RUSS 4221 Stalinism: Society and Culture	
RUSS 4471 Women in 20th-21st Century Russian Culture	
RUSS 4481 Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4821 20th Century Russian Literature and Art	
Select two of the following:	8
RUSS 3060 Advanced Russian for Heritage Speakers (Part 1) ¹	
RUSS 4010 Advanced Conversation and Composition 1 ¹	
RUSS 4020 Advanced Conversation and Composition 2 ¹	
RUSS 4060 Advanced Russian for Heritage Speakers (Part 2) ¹	
Select one of the following:	3
RUSS 4050 Professional Russian	
RUSS 4210 Topics in Russian Culture	
RUSS 4230 Russian Cultural Idioms	
RUSS 4851 Critical Thinking: Russian Film and Society	
OR 6 credit hours of upper-division study abroad Russian language class	
Total Credit Hours	33

¹ Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060.

NOTE: Beginning or middle-level language course requirements may be met by transfer credit or by testing out of the course. Students who enter at and enroll in Russian language courses at the 3000 or 4000 level may not receive credit for lower-division Russian language courses unless lower-division language coursework was completed prior to registration for 3000 or 4000 level Russian language courses. Study Abroad is recommended after the second year language study.

Track B: Russian Culture and Literature

Required Courses	14
RUSS 2010 Second-Year Russian 1	
RUSS 2020 Second-Year Russian 2	
RUSS 4811 19th Century Russian Literature	
RUSS 4821 20th Century Russian Literature and Art	
Aspects of Russian/Soviet/Post-Soviet Culture. Select two of the following:	6
RUSS 2211 Introduction to Russian Culture	
RUSS 2221 Introduction to Modern Russian Culture	
RUSS 2222 Sports and the Cold War	
RUSS 2501 Russia Today	
RUSS 3601 Russian Culture Past and Present	
RUSS 3701 Slavic Folk Culture: Ideals and Values in the Contemporary World	
RUSS 4221 Stalinism: Society and Culture	
RUSS 4301 American-Russian Cultural Relations	
2000-level Literature/Film courses. Select one of the following:	3
RUSS 2231 Fairy Tales of Russia	
RUSS 2241 The Vampire in Literature and the Visual Arts	
RUSS 2251 Knights and Amazons: Superheroes in Russian Epics and Film	
RUSS 2261 The Russian Short Story	

RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century	
3000/4000-level Literature/Film Courses. Select two of the following:		6
RUSS 3211	History of Russian Cinema	
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	
RUSS 3301	Contemporary Issues in Russian Film	
RUSS 4401	The Russian Jewish Experience	
RUSS 4431	Dostoevsky	
RUSS 4441	Tolstoy	
RUSS 4451	Chekhov	
RUSS 4471	Women in 20th-21st Century Russian Culture	
RUSS 4831	Contemporary Russian Literature	
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4861	Absurd and Supernatural in Russian Literature	
Any one 3000-4000 level Russian or GSLL culture/literature or language course or course in other departments pertaining to Russia, upon consent of advisor OR upper division study abroad language class		3
Total Credit Hours		32

Track C: Russian Major for Heritage Speakers

If you are a native speaker of Russian (speak or spoke Russian at home while growing up) and/or who attended school in Russia or the former Soviet Union for one or more years when their family lived there, may be eligible for our heritage speakers track. Heritage speakers of Russian who wish to major in Russian should speak with the advisor for the Russian major to map out a specific plan for their major.

Required Courses:		7-8
RUSS 3060	Advanced Russian for Heritage Speakers (Part 1) ¹	
RUSS 4060	Advanced Russian for Heritage Speakers (Part 2) (or any other upper-division Russian language course) ¹	
	or RUSS 4010 Advanced Conversation and Composition 1	
	or RUSS 4020 Advanced Conversation and Composition 2	
	or RUSS 4050 Professional Russian	
	or RUSS 4210 Topics in Russian Culture	
	or RUSS 4230 Russian Cultural Idioms	
	or RUSS 4850 Critical Thinking: Russian Film and Society	
Select one of the following (19th century and earlier periods):		6
RUSS 2211	Introduction to Russian Culture	
RUSS 3601	Russian Culture Past and Present	
RUSS 4811	19th Century Russian Literature	
Select one of the following (20th and 21st centuries):		3
RUSS 2222	Sports and the Cold War	
RUSS 2231	Fairy Tales of Russia	
RUSS 2241	The Vampire in Literature and the Visual Arts	
RUSS 2251	Knights and Amazons: Superheroes in Russian Epics and Film	
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century	
RUSS 2501	Russia Today	
Select three of the following:		9

RUSS 3211	History of Russian Cinema	
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia	
RUSS 3301	Contemporary Issues in Russian Film	
RUSS 3701	Slavic Folk Culture: Ideals and Values in the Contemporary World	
RUSS 4221	Stalinism: Society and Culture	
RUSS 4301	American-Russian Cultural Relations	
RUSS 4401	The Russian Jewish Experience	
RUSS 4471	Women in 20th-21st Century Russian Culture	
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 4831	Contemporary Russian Literature	
Select one of the following:		3
RUSS 4431	Dostoevsky	
RUSS 4441	Tolstoy	
RUSS 4451	Chekhov	
RUSS 4841	History of Modern Russian Drama	
RUSS 4861	Absurd and Supernatural in Russian Literature	
One other 3000-4000 level Russian or GSLL culture/literature or language course, or course in another department pertaining to Russia, upon consent of advisor		3
Total Credit Hours		31-32

¹ Students may not receive credit for both RUSS 3060 and RUSS 4010 or RUSS 4020 and RUSS 4060.

Graduating in Four Years

TRACK A - RUSSIAN LANGUAGE AND CULTURE (36)

Course	Title	Credit Hours
Year One		
During the first year, students typically take RUSS 1010 and 1020 (8 credit hours) which does not count toward their majors.		0
One of the courses on 19th century or earlier periods		3
		Credit Hours 3
Year Two		
RUSS 2010 & RUSS 2020	Second-Year Russian 1 and Second-Year Russian 2 (or Study Abroad)	8
One of the courses on 20th-21st centuries		3
		Credit Hours 11
Year Three		
RUSS 3010 & RUSS 3020	Third-Year Russian 1 and Third-Year Russian II (or Study Abroad)	8

Elective 2000-4000 level RUSS or GSSL course	3
Credit Hours	11

Year Four

RUSS 4010 & RUSS 4020 or RUSS 3060 and RUSS 4060	Advanced Conversation and Composition 1 (or Study Abroad) or Advance Russian for Heritage Speakers (Part 1) and Advance Russian for Heritage Speakers (Part 2)	8
RUSS 4210 or RUSS 4230 or RUSS 4851 or RUSS 4050	Topics in Russian Culture or Russian Cultural Idioms or Critical Thinking: Russian Film and Society or Professional Russian	3
Credit Hours		11
Total Credit Hours		36

TRACK B - RUSSIAN LITERATURE AND CULTURE (32)

Course	Title	Credit Hours
Year One		
One 2000 level course on the aspects of Russian Culture		3
Credit Hours		3
Year Two		
RUSS 2010 & RUSS 2020	Second-Year Russian 1 and Second-Year Russian 2 (or Study Abroad)	8
One 2000 level Russian literature or film course		3
Credit Hours		11

Year Three

RUSS 4811	19th Century Russian Literature	3
RUSS 4821	20th Century Russian Literature and Art	3
One 3000-4000 level course on the aspects of Russian culture		3
Credit Hours		9

Year Four

Two 3000-4000 level RUSS literature or film courses		6
Elective 3000-4000 level RUSS or GSSL culture, literature or language course		3
Credit Hours		9
Total Credit Hours		32

TRACK C - HERITAGE SPEAKERS (32)

Course	Title	Credit Hours
Year One		
RUSS 3060 & RUSS 4060	Advanced Russian for Heritage Speakers (Part 1) and Advanced Russian for Heritage Speakers (Part 2)	8
One of the RUSS courses on 19th century or earlier periods OR Study Abroad		3
Credit Hours		11
Year Two		
One of the RUSS courses on 20th-21st centuries		3
One of the 2000-level RUSS culture courses		3
Credit Hours		6
Year Three		
One 4000 level RUSS literature course		3
Two 3000-4000 level RUSS culture courses		6
Credit Hours		9
Year Four		
One 3000-4000 level RUSS culture course		3
One elective 3000-4000 level RUSS or GSSL culture, literature or language course		3
Credit Hours		6
Total Credit Hours		32

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in Germanic or Russian studies, students should meet the following requirements:

- Begin to study the language in the freshman year, or have received AP credit.

- In consultation with the major program advisor before the end of the drop/add period in the first semester, plan a tentative schedule of courses to be taken over eight semesters.
- Discuss progress toward the degree each semester with the major advisor.

Note: Although these requirements apply only in cases in which students are seeking to graduate under the terms of the four-year guarantee, they are good advice for all majors. Consult the program advisor about the major at any time.

Russian Studies - Minor

The Russian minor introduces students to the basics of Russian Studies. Students fulfilling requirements for Russian minor have to take two years of Russian language and a number of survey courses in culture and literature.

Requirements

Declaration of a minor in Russian studies is open to any student enrolled at CU Boulder, regardless of college or school.

A minor in Russian requires the completion of 20 credit hours. All courses used to fulfill requirements for the minor must receive a grade of C- or better. (None may be taken pass/fail.) Students may not apply more than 9 hours of transfer credit (including 6 upper-division credit hours) toward the minor. Transfer courses must be approved by the department.

Required Courses and Semester Credit Hours

RUSS 2010	Second-Year Russian 1 ¹	4
RUSS 2020	Second-Year Russian 2 ¹	4
RUSS 3010	Third-Year Russian 1 (or any 3000-4000 level Russian literature, film or culture course)	4
One additional 2000-4000 level RUSS course		3
Select one of the following:		3
RUSS 2211	Introduction to Russian Culture	
RUSS 2221	Introduction to Modern Russian Culture	
RUSS 3601	Russian Culture Past and Present	
Select one of the following:		3
RUSS 4811	19th Century Russian Literature	
RUSS 4821	20th Century Russian Literature and Art	
Total Credit Hours		21

¹ Heritage speakers should take RUSS 3060 and RUSS 4060 as well as any other 4000-level Russian language course in lieu of RUSS 2010 and RUSS 2020. In this case, 18 credit hours will be sufficient for the minor if other requirements are fulfilled.

History

The history major is defined in such a way as to allow each student to structure a set of courses which is consistent with his or her individual interests and goals. A successful program in history will be one which has been thought through in advance rather than being a random array of classes which happen to fit into each semester's schedule. For more information, please see our sample schedule in a typical progression through the major (<http://www.colorado.edu/history/node/58/attachment>).

Once you have decided upon your area of interest, consider what courses in departments other than history might contribute to a rich yet integrated program. Thus, if you are interested in the history of England, courses in English literature, philosophy, and political science might be helpful. A person focusing on economic history might want to do some work in economics, math, and possibly geography. If you have not yet fulfilled your language requirement and are interested in Latin American History, Spanish might be the ideal language to take.

Bachelor's Degree

- History - Bachelor of Arts (BA) (p. 382)

Minor

- History - Minor (p. 384)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Fred W (https://experts.colorado.edu/display/fisid_104273)
Professor; PhD, Harvard University

Anderson, Virginia D (https://experts.colorado.edu/display/fisid_100365)
Professor; PhD, Harvard University

Andrews, Thomas G (https://experts.colorado.edu/display/fisid_149881)
Professor; PhD, University of Wisconsin-Madison

Babicz, Martin Charles (https://experts.colorado.edu/display/fisid_147676)
Instructor

Bruce, Scott (https://experts.colorado.edu/display/fisid_122945)
Professor; PhD, Princeton University

Byerly, Carol R (https://experts.colorado.edu/display/fisid_109670)
Lecturer

Carlos, Ann M (https://experts.colorado.edu/display/fisid_105534)
Professor; PhD, Univ of Western Ontario (Canada)

Catlos, Brian Aivars (https://experts.colorado.edu/display/fisid_147829)
Professor; PhD, Univ of Toronto (Canada)

Chambers, Lee Virginia (https://experts.colorado.edu/display/fisid_106130)
Associate Professor; PhD, University of Michigan Ann Arbor

Chester, Lucy P (https://experts.colorado.edu/display/fisid_126541)
Associate Professor; PhD, Yale University

Christensen, Carl C.
Professor Emeritus

Ciarlo, David Michael (https://experts.colorado.edu/display/fisid_149618)
Associate Professor; PhD, University of Wisconsin-Madison

Dauverd, Celine (https://experts.colorado.edu/display/fisid_145804)
Associate Professor; PhD, University of California-Los Angeles

Dike, Steven (https://experts.colorado.edu/display/fisid_149880)
Instructor; MA, University of Virginia Central office

- Engel, Barbara A.
Professor Emeritus
- Fenn, Elizabeth Anne (https://experts.colorado.edu/display/fisid_149896)
Professor; PhD, Yale University
- Ferry, Robert J (https://experts.colorado.edu/display/fisid_104214)
Associate Professor; PhD, University of Minnesota Twin Cities
- Gautam, Sanjay Kumar (https://experts.colorado.edu/display/fisid_140614)
Associate Professor; PhD, University of Chicago
- Gerber, Matthew Dean (https://experts.colorado.edu/display/fisid_129799)
Associate Professor; PhD, University of California-Berkeley
- Gonzalez, Fredy (https://experts.colorado.edu/display/fisid_152971)
Assistant Professor; PhD, Yale University
- Gross, David L (https://experts.colorado.edu/display/fisid_103329)
Professor; PhD, University of Wisconsin-Madison
- Gutmann, Myron (https://experts.colorado.edu/display/fisid_154905)
Professor; PhD, Princeton University
- Halperin, Liora R (https://experts.colorado.edu/display/fisid_152972)
Assistant Professor; PhD, University of California-Los Angeles
- Hammer, Paul E. J. (https://experts.colorado.edu/display/fisid_146581)
Professor; PhD, University of Cambridge (England)
- Hanna, Martha (https://experts.colorado.edu/display/fisid_104557)
Professor; PhD, Georgetown University
- Hill, Boyd H. Jr
Professor Emeritus
- Hohlfelder, Robert
Professor Emeritus
- Hulden, Vilja Paivikki (https://experts.colorado.edu/display/fisid_154910)
Instructor
- Hunt, Peter (https://experts.colorado.edu/display/fisid_115394)
Professor; PhD, Stanford University
- Jankowski, James P.
Professor Emeritus
- Kent, Susan K (https://experts.colorado.edu/display/fisid_100080)
Professor; PhD, Brandeis University
- Kim, Kwangmin (https://experts.colorado.edu/display/fisid_147160)
Assistant Professor; PhD, University of California-Berkeley
- Kingsberg, Miriam L. (https://experts.colorado.edu/display/fisid_147112)
Associate Professor; PhD, University of California-Berkeley
- Lebra, Joyce Chapman
Professor Emeritus
- Lester, Anne E (https://experts.colorado.edu/display/fisid_139524)
Associate Professor; PhD, Princeton University
- Lim, Sungyun A. (https://experts.colorado.edu/display/fisid_148726)
Assistant Professor; PhD, University of California-Berkeley
- Limerick, Patricia N (https://experts.colorado.edu/display/fisid_105459)
Professor; PhD, Yale University
- Maeda, Daryl Joji (https://experts.colorado.edu/display/fisid_141460)
Associate Professor; PhD, University of Michigan Ann Arbor
- Main, Gloria L.
Professor Emeritus
- Mann, Ralph
Professor Emeritus
- McGranahan, Carole Ann (https://experts.colorado.edu/display/fisid_122673)
Associate Professor; PhD, University of Michigan Ann Arbor
- McIntosh, Marjorie K.
Professor Emeritus
- Medak-Saltzman, Danika Fawn (https://experts.colorado.edu/display/fisid_145844)
Assistant Professor; PhD, University of California-Berkeley
- Mukherjee, Mithi (https://experts.colorado.edu/display/fisid_123112)
Associate Professor; PhD, University of Chicago
- Osborne, Myles Gregory (https://experts.colorado.edu/display/fisid_145809)
Associate Professor; PhD, Harvard University
- Paradis, David (https://experts.colorado.edu/display/fisid_126959)
Instructor; PhD, Emory University
- Perez, Emma Marie (https://experts.colorado.edu/display/fisid_130962)
Professor; PhD, University of California-Los Angeles
- Phillips, George H.
Professor Emeritus
- Pittenger, Mark A (https://experts.colorado.edu/display/fisid_102007)
Professor; PhD, University of Michigan Ann Arbor
- Ruestow, Edward G.
Professor Emeritus
- Scamehorn, Howard Lee
Professor Emeritus
- Schulzinger, Robert D.
Professor Emeritus
- Shneer, David (https://experts.colorado.edu/display/fisid_146105)
Professor; PhD, University of California-Berkeley
- Sohi, Seema (https://experts.colorado.edu/display/fisid_144616)
Associate Professor; PhD, University of Washington
- Spires, David N.
Professor Emeritus
- Sutter, Paul Shriver (https://experts.colorado.edu/display/fisid_147513)
Professor; PhD, University of Kansas
- Wei, William (https://experts.colorado.edu/display/fisid_100864)
Professor; PhD, University of Michigan Ann Arbor

Weston, Timothy B (https://experts.colorado.edu/display/fisid_107605)
Associate Professor; PhD, University of California-Berkeley

Willis, John Matthew (https://experts.colorado.edu/display/fisid_140095)
Associate Professor; PhD, New York University

Yonemoto, Marcia A (https://experts.colorado.edu/display/fisid_107199)
Associate Professor; PhD, University of California-Berkeley

Young, Phoebe S. K. (https://experts.colorado.edu/display/fisid_147429)
Associate Professor; PhD, University of California-San Diego

Zeiler, Thomas W (https://experts.colorado.edu/display/fisid_101692)
Professor; PhD, University of Massachusetts at Amherst

HIST 1011 (3) Greeks, Romans, Kings & Crusaders: European History to 1600

Examines the history and formation of Europe from its roots in the ancient Near East to Greece to the creation of Medieval states and kingdoms. Topics may include the rise of Christianity, Barbarian migrations, religious persecution, the role of gender and minority status, the growth of trade and European encounters, the Black Death, the European Renaissance the Protestant Reformation.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Ancient and Medieval

MAPS Course: Social Sci World Context

MAPS Course: Social Science

HIST 1012 (3) Empire, Revolution and Global War: European History Since 1600

Examines the history of modern Europe from 1600. Topics may include religious conflict, absolutions, the Scientific Revolution, the global impact of European colonialism and imperialism, the Enlightenment, the French and Industrial Revolutions, and the emergence of romanticism, nationalism, liberalism, socialism and modernism. Concludes by analyzing World War I and II, communist and fascist totalitarianisms, decolonization and the Cold War. Formerly HIST 1020

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Modern

MAPS Course: Social Sci World Context

MAPS Course: Social Science

HIST 1015 (3) American History to 1865

Examines American history from pre-Columbian times to the Civil War, including ancient cultures, exploration, colonization, Native American responses, the rise of race slavery, the American Revolution, political developments, Anglo-American expansion, slave life and culture, the market revolution, industrialization, reform and disunion. Introduces students to history as a dynamic discipline that shapes our understanding of the past and present. S. history.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Departmental Category: United States: Chronological Periods

MAPS Course: Social Science

MAPS Course: Social Science US Context

HIST 1018 (3) Introduction to Early Latin American History to 1810

Introduces students to the history of what is now called Latin America from about 1450 to the wars of independence in the nineteenth century. Examines pertinent aspects of the societies and cultures of indigenous people, the history of European conquest, and the most salient features of the Spanish and Portuguese colonial empires in America.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1025 (3) American History since 1865

Explores political, social and cultural changes in American life since Reconstruction. Focuses on shifting social and political relations as the U.S. changed from a nation of farmers and small-town dwellers to an urban, industrial society; the changing meaning of American identity in a society divided by ethnicity, race and class; and the emergence of the U.S. as a world power.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Departmental Category: United States: Chronological Periods

MAPS Course: Social Science

MAPS Course: Social Science US Context

HIST 1028 (3) Introduction to Modern Latin American History since 1800

Introduces students to the history of Latin America from independence to the present. Investigates the social implications of various models of economic development, the opportunities and difficulties resulting from economic ties with wealthier countries, the consequences of ethnic, gender and class divisions, and the struggles of Latin Americans to construct equitable political systems.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1051 (3) The World of the Ancient Greeks

Surveys the emergence, major accomplishments, failures and decline of the world of the ancient Greeks, from Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.)

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1051

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Ancient and Medieval

HIST 1061 (3) The Rise and Fall of Ancient Rome

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1061

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Ancient and Medieval

HIST 1113 (3) Introduction to British History to 1660

Deals with Roman, medieval and early modern periods. Covers the demographic, economic, social patterns, political and religious developments, and cultural changes that contributed to the formation of the English nation.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Specific Countries

HIST 1123 (3) Introduction to British History Since 1660

Deals with the period from the 17th century to the present. Political, economic, social and imperial developments that contributed to creation of the modern industrial and democratic state are the major issues covered.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Specific Countries

HIST 1218 (3) Introduction to Sub-Saharan African History to 1800

Provides an introduction to African history, beginning with early man and ending in 1800. Moves rapidly through civilizations as different as Ancient Egypt, Mali, Oyo and the Cape Colony, touching on important developments and highlighting themes relevant to the history of Africa as a whole. Including migration, technology, environment, trade, gender, religion, slavery and more.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1228 (3) Introduction to Sub-Saharan African History Since 1800

Introduces students to the history of Sub-Saharan Africa from 1800 to the present. Major topics of study included the trans-Atlantic slave trade, African state-building, European colonialism, African responses to colonialism and issues facing independent African nations, ranging from debt to HIV/AIDS.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1308 (3) Introduction to Middle Eastern History

Interdisciplinary course that focuses on medieval and modern history of the Middle East (A.D. 600 to the present). Introduces the Islamic civilization of the Middle East and the historical evolution of the region from the traditional to the modern eras. Covers social patterns, economic life, and intellectual trends, as well as political development.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1438 (3) Introduction to Korean History

Surveys the history of Korea from the ancient period to the early twenty-first century. Topics will include: transnational political and cultural origins of Korea, transformation of gender relations, and effects of wars and colonial experience. Special attention given to the transnational character of historical developments in Korea, as well as historical debates involving neighboring countries in East Asia.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1518 (3) Introduction to South Asian History to 1757

Introduces the history of South Asia, providing a general acquaintance with the narratives and interpretations of ancient and medieval history of the Indian subcontinent from the rise of the Indus Valley Civilization in 3500 BCE to the end of the Mughal Empire in 1757 CE. Intended for students with little or no prior knowledge of the region.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1528 (3) Introduction to South Asian History since 1757

Introduces the history of modern South Asia from 1757 to the present. Examines themes such as the nature of British colonial state formation in South Asia, social transformation under British rule, modes of anticolonial resistance movements, particularly Mahatma Gandhi's nonviolent civil disobedience movement, Muslim nationalism and the formation of Pakistan, and current political conflicts involving India, Pakistan and Afghanistan.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1618 (3) Introduction to Chinese History to 1644

Introduces students to the history of China from Neolithic period to Ming period (1368-1644). Investigates the social patterns, gender relations, economic structure, intellectual trends, and political developments of China. Pays special attention to China's long-standing interaction with the rest of the world, which played a crucial role in the historical development of Chinese society.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1626 (3) Introduction to Central and East European History since 1770

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

Equivalent - Duplicate Degree Credit Not Granted: CEES 1626

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Specific Countries

HIST 1628 (3) Introduction to Chinese History since 1644

Introduces students to modern Chinese history and culture, from the 17th century to the present. Considers the pertinent aspects of modern China, focusing on its social patterns, economic structure, intellectual trends and political developments.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1708 (3) Introduction to Japanese History

A broad interdisciplinary survey of the history of Japan from earliest times to the 20th century. Explores the development of political institutions, social structures, cultural and religious life, economic development, and foreign relations in an historical perspective.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1800 (3) Introduction to Global History

Applies a broad perspective to the global past in order to illuminate how common historical patterns and processes as well as unique elements shaped the human experience. Using a thematic approach, introduces highlights cross-cultural interactions among societies, and, when relevant, how historical processes that began centuries ago still impact the contemporary world. Topic will vary by semester. Department enforced prerequisite: 3 hours of any history coursework.

Requisites: Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) History (HIST) majors and minors only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 1818 (3) Introduction to Jewish History: Bible to 1492

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1818 and RLST 1818

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 1828 (3) Introduction to Jewish History since 1492

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and anti-semitism.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1828 and RLST 1828

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions

HIST 1830 (3) Global History of Holocaust and Genocide

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1830 and RLST 1830

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Methodological, Comparative, and Global

HIST 2015 (3) Themes in Early American History

Examines major themes in the development of colonial societies in North America from the 15th to the early 19th centuries. Explores intercultural relations, economic development, labor systems, religion and society, and family life. Specific course focus may vary.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: United States Context

Departmental Category: United States: Chronological Periods

HIST 2100 (3) Revolution in History

Examines the causes, character, and significance of political revolution in world history. Concentrating on one of the major revolutions of modern history, it examines why revolutions occur, who participates in revolution, and to what effect. Specific course focus varies.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Methodological, Comparative, and Global

HIST 2110 (3) History of Early Modern Societies

Examines major themes in Early Modern history in a variety of global contexts. Issues to be explored could include intellectual developments, religion, popular culture, social history, economic and political changes, and states and warfare, usually in a specific region or nation (i.e. Europe, Latin America, the Atlantic World, Spain, Russia, China, Japan, etc.). Topics vary in any given semester.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Methodological, Comparative, and Global

HIST 2126 (3) Issues in Modern U.S. Politics and Foreign Relations

Traces the historical development of modern U.S. politics and foreign relations. Analyzes subjects such as the Cold War, the Vietnam War, the War on Terror, and the relationship between foreign and domestic politics, and the developing meaning of political conservatism, liberalism, and radicalism in the U.S. Explains the impact of race, gender, class, and immigration. Topics vary in any given semester.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

HIST 2166 (3) The Vietnam Wars

Traces the causes, course, and outcome of the wars in Vietnam from 1940 until 1975. Explains the successes of the revolutionaries and the failures of the French and Americans. Analyzes the development of Vietnamese nationalism, French colonialism, and U.S. intervention.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4166

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

Departmental Category: Asia Content

HIST 2170 (3) History of Christianity 1: To the Reformation

General introduction to the history of Christianity from its beginnings through the first period of the Protestant Reformation. Examines religious life and the church in relation to its social and cultural setting.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context

Departmental Category: Methodological, Comparative, and Global

HIST 2220 (3) History of War and Society

Focuses on war and society in a variety of global contexts. Explores the character, origins, and social, political, and intellectual impacts of war in contexts ranging from several centuries of international conflict to the experience of individual nations in specific wars. Topic varies in any given semester; contact Department of History for details.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context

Departmental Category: Methodological, Comparative, and Global

HIST 2326 (3) Issues in the History of U.S. Society and Culture

Examines the origins, development, and impacts (social, political, cultural, economic, etc.) of significant issues and themes in the cultural, intellectual, and/or social history of the United States from independence to the present day. Explains the impact of race, gender, ethnicity, and class on these issues. Topics vary in any given semester.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

HIST 2437 (3) African American History

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2432

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 2

HIST 2516 (3) America Through Baseball

Baseball could not have existed without America. Explains how the game fit into the larger context of social, cultural, economic and political history from the 19th century to the present. Studies the events and people who made baseball the national pastime.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4556

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

HIST 2616 (3) History of Gender in America

Introduces the social and cultural construction of femininity and masculinity in America from 1500 to the present. Explores gender as a status acquired and performed through tasks, clothing, adornment and bodily movement. Examines gender ideals, expression and practices such as gender crossing, gender bending and gender plan.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Human Diversity

Departmental Category: United States: Topical Courses 1

HIST 2629 (3) China in World History

Examines the multiple connections between Chinese history and other parts of the world over the course of China's long history. Specific course focus may vary by instructor/term.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 3012 (3) Seminar in Modern European History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Modern

HIST 3018 (3) Seminar in Latin American History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 3020 (3) Historical Thinking & Writing

Develops the research techniques and habits of mind required to succeed in the History major, honing students' critical, analytical, and synthetic skills while introducing them to History as a discipline and a way of understanding the world. Students practice the kinds of writing required in upper-division History classes. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prereq courses of HIST 1800 and ARSC 1080 or 1150 or CLAS 1020 or ENGL 1001 or PHIL 1500 or WRTG 1100 or 1150 or 1250 (all min grade C-). Restricted to students with 27-180 credits (Soph, Jr, or Sr) History (HIST) majors only.

Additional Information: Arts Sci Core Curr: Written Communication

Departmental Category: Methodological, Comparative, and Global

HIST 3109 (3) Seminar in Asian History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 3110 (3) Honors Seminar

Practical historiography for students who wish to write a senior honors thesis. Emphasizes choice of topic, critical methods, research, organization, argumentation, and writing.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Arts Sciences Honors Course

Departmental Category: Methodological, Comparative, and Global

HIST 3112 (3) Seminar in Renaissance and Reformation

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Modern

HIST 3113 (3) Seminar in Medieval and Early Modern English History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 3115 (3) Seminar in Early American History**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 3116 (3) Seminar in American Diplomatic History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 3120 (3) Honors Thesis**

Department enforced prerequisite: HIST 3110 and instructor consent.

Additional Information: Arts Sciences Honors Course
Departmental Category: Methodological, Comparative, and Global**HIST 3133 (3) Seminar in Britain since 1688****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 3212 (3) Seminar in Early Modern Europe****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Modern**HIST 3218 (3) Seminar in African History**

Deals with the history and anthropology of selected west African societies in the period before the imposition of European colonial rule.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 3317 (3) Seminar in the American West****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 3328 (3) Seminar in Middle Eastern History**

Examines selected issues in modern Middle Eastern history. Check with the department concerning the specific subject of the seminar.

Repeatable: Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content**HIST 3414 (3) Seminar in Modern European Thought and Culture****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Topical**HIST 3415 (3) Seminar in Recent American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 3416 (3) Seminar in American Society and Thought****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 3417 (3) Seminar in African American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 3511 (3) Seminar in Medieval History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Ancient and Medieval

HIST 3516 (3) American Culture and Reform, 1880--1920

Addresses the issues of reform, religion, and culture that emerged as a 19th century world view confronted a 20th century America.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 3616 (3) Seminar in U.S. Women's History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 3628 (3) Seminar in Recent Chinese History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 3713 (3) Seminar in Russian History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 3718 (3) Seminar in Japanese History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 3800 (3) Seminar in Global History

Organized around themes that change year to year, this seminar allows students to explore and research processes, phenomena, and events of global significance in historical context. Stress will be upon subjects that span multiple world areas. Possible topics include: the international arms trade; slavery; health and disease; youth culture; women's rights; genocide. See department for current theme.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 3840 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 3841 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 3842 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Europe: Modern

HIST 3843 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Europe: Specific Countries

HIST 3844 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Europe: Topical

HIST 3845 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: United States: Chronological Periods

HIST 3846 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 3847 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 3848 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 3849 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 4013 (3) Law and Society in Premodern England to 1688

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5013

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4018 (3) Aztecs, Incas, and the Spanish Conquest of the Americas

Building upon contemporary texts and modern histories of both famous and ordinary people, this course examines the indigenous empires known as the Aztecs and the Incas. It also examines the encounter of Europeans and native people, following the history of exploration and conquest from the time of Columbus to about 1550. Equal consideration is given to the course's three components: Aztec, Inca and the Spanish conquest.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1018 or HIST 3020.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4020 (3) Topics in Comparative History

Explores historical themes from a comparative perspective. Encourages students to think more analytically about historical change. Consult current online schedule for specific topics. Often team-taught by more than one faculty.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite two 4000-level History courses in differing content areas.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4021 and CLAS 5021

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4031 and CLAS 5031

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1509 or CLAS 2039 or CLAS 4139 or CLAS 4149 or CLAS 2041 or CLAS 4021 or CLAS 4041 or HIST 1051 or GREK 3113.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4040 (3) The History of Space Exploration and Defense

This course examines the development and impact of American, Soviet/Russian, and European civilian and military space activities from the dawn of the space age to the space challenges of the 21st century.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4041 and CLAS 5041 and PHIL 4210

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1061 or HIST 1011 or HIST 1051 or HIST 1061 or PSCI 2004 or PHIL 3000.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4048 (3) Latin American Revolutions

Examines the origins, development and continuing influence of 20th-Century Latin American revolutionary movements, with a focus on placing these struggles in comparative historical context. Explores various approaches to revolution and the general role of left political formations in Latin America. Specific focus can vary by semester with examples drawn from various Latin American countries, including Mexico, Guatemala, Cuba, Chile and Nicaragua.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5048

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1018 or HIST 1028 or HIST 3020.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4050 (3) A Global History of World War II

Examines World War II in a global perspective. This era witnessed transformations in the social, political and economic orders across the globe. Traces the domestic and international developments, including military issues, that shaped the period in Europe, Asia, Africa and North America and assesses the war's legacy.

Requisites: Requires prerequisite course of HIST 1012 or 1025 or 1028 or 1123 or 1228 or 1308 or 1528 or 1628 or 1708 or 1800 or 1828 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

Departmental Category: Asia Content

HIST 4053 (3) Britain and the Empire, 1688-1964

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5053

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the east as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5061 and CLAS 4061 and CLAS 5061

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence, and the selective use of comparisons with better known societies. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4071 and CLAS 5071

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republic government. Readings are in the primary sources. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4081 and CLAS 5081

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4083 (3) Revolution and Nationalism in Modern Ireland

Surveys Irish nationalist movements since the eighteenth century, treating constitutional nationalism, revolutionary republicanism and Gaelic cultural movements while also examining the development of Unionism in Ulster as a response to political and cultural nationalism. Emphasizes the political, religious and cultural roots of the current sectarian crisis in Northern Ireland and analyzes that crisis up to the present day.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1123.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4091 (3) The Roman Empire

Studies Imperial Roman history beginning with the Roman Revolution and ending with examination of the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the Empire.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4091 and CLAS 5091

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4109 (3) World War II in Asia and the Pacific

For Asia, World War II began with the Mukden Incident (1931), resulting in the Japanese domination of Manchuria and leading to a full-scale war between China and Japan in 1937. Only after the Japanese attacked the U.S. Pacific fleet at Pearl Harbor four years later did the United States enter the war. Discusses the various socioeconomic and political factors leading to the war in Asia, examines the nature of the conflict on the Asian mainland and in the Pacific, and assesses legacy of the war on all those involved.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 4116 (3) History of U.S. Foreign Relations, 1865-1940

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5116

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4117 (3) Colorado History

Presents the story of the people, society, culture, and environment of Colorado from the earliest Native Americans, through the Spanish influx, the fur traders and mountain men, the gold rush, railroad builders, the cattlemen and farmers, the silver boom, the twentieth-century tourists, city-dwellers, workers and activists. Highlights the historical origins of twenty-first century institutions, problems, challenges, and opportunities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4118 (3) History of Mexico to 1821

Studies Mexican history beginning with roots and evolution of pre-Columbian civilizations and concluding with the events of Mexican independence in 1821. Emphasizes society and culture of the Aztecs and Mayans, the Spanish conquest of Mexico, and the colonial regime of New Spain.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4122 (3) Europe During the Renaissance

Explores the history and culture of Western Europe, 1300-1520. Comprehensive in scope, with analysis of political, economic, social, religious, intellectual and artistic matters. Discusses significance of the Renaissance for origins of modern civilization.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011.

Additional Information: Departmental Category: Europe: Modern

HIST 4123 (3) Medieval England

Treats the major developments in English history from the Anglo-Saxon period through the 15th century. Emphasizes late medieval English society during the 13th and 14th centuries.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4125 (3) Early American History to 1763

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5125

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4126 (3) History of U.S. Foreign Relations Since 1941

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5126

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4128 (3) The History of Modern Mexico Since 1821

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5128

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1028 or HIST 3020.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4131 (3) The Origins of Christianity

Surveys the sources for the development of ancient Christianity from the ministry of Jesus Christ to the conversion of the emperor Constantine in the early 4th century. Through lectures and a close reading of primary source materials in translation, students will examine the social activity and theological development of early Christians in their Roman and Jewish context.

Requisites: Requires prerequisite course of HIST 1011 or HIST 1061 or HIST 2170 or CLAS 1061 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4133 (3) The Tudors: British History 1485-1603

Deals with the history of England from 1485 to 1603. Examines patterns of daily life, the impact of the Reformation and the Renaissance and the development of Parliament and the monarchy under the Tudor rulers, especially Henry VIII and Elizabeth.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4143 (3) The Making of Great Britain: British History 1603-1714

Covers the history of the British Isles from 1603 to 1714, the era of the English Civil War and the Glorious Revolution. Traces economic and social relationships, cultural change and religious and political conflict under the Stuart monarchs.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1012 or HIST 1113 or HIST 1123.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4146 (3) U.S. Military History since 1898

Examines America's national defense and war efforts from the Spanish American War to the present, emphasizing causes and consequences of modern conflicts, and the impact of military activities on American society.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4153 (3) Emergence of Modern Britain, 1688-1851

Surveys British history from the Revolution of 1688 to the Great Exhibition in 1851. Topics include creation of the United Kingdom, traditional popular culture, birth of a consumer society, the British Enlightenment, the Evangelical Revival, loss of the American colonies, imperial expansion in Asia, war with Revolutionary and Napoleonic France, the Industrial Revolution, and the impact of utilitarianism and political radicalism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1113 or HIST 1123.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4158 (3) History of Modern Brazil

Surveys the post independence history of 19th and 20th century Brazil. Looks at the development of Brazilian nationalism and political institutions and focuses heavily on race, ethnicity, gender and sexuality in Brazil, understanding how different peoples have settled and accommodated themselves to the Brazilian environment. Finally, it will look at Brazilian economic development and its consequences at the beginning of the 21st century.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4166 (3) The Vietnam War in Politics and Culture

Examines America's second-longest and most divisive war from the beginning of the U.S. involvement in the 1950s to the repercussions echoing into the 1980s. Considers the global context, motives, and evolution of U.S. involvement, support for and opposition to the war at home, the war's repercussions in international policy and domestic politics, and representations of the war in popular culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 2166

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

Departmental Category: Asia Content

HIST 4190 (3) French Connections: Contemporary France and America in Historical Context

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3500

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Methodological, Comparative, and Global

HIST 4205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

Equivalent - Duplicate Degree Credit Not Granted: HIST 5205

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4212 (3) The Age of Religious Wars: Reformation Europe, 1500-1648

Traces the history of Europe from the end of the Hundred Years War through the Thirty Years War. During this period Europe experienced tremendous changes including emerging religious heresies, the advent of the Spanish Inquisition, violent civil wars, the witch craze, and the Thirty Years War, a precursor to the World Wars of the 20th century.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Modern

HIST 4215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5215

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4217 (3) The American West in the 19th Century

Explores cultural, social and political interaction in the American West during the 19th century. Themes include environmental change; conflict and syncretism across race, class, and gender lines; mythic images, and their relationship to the "Real" West.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4218 (3) Lost Kingdoms & Caliphates: West Africa to 1900

Investigates the formation and dissolution of West Africa's kingdoms, caliphates and stateless societies during the era of the trans-Atlantic and trans-Saharan slave trades. Through a survey of oral and written sources, this course examines West Africa's geopolitical transformation in warfare, jihad, trade and slavery, especially in relation to the African Diaspora to the Americas and Muslim world.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4222 (3) War and the European State, 1618-1793

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

Equivalent - Duplicate Degree Credit Not Granted: HIST 5222

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Modern

HIST 4223 (3) The French Revolution and Napoleon

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades of revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5223

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4227 (3) The American West in the 20th Century

Explores cultural, social, and political interaction in the American West during the 20th century. Themes include popular culture, state-federal relationships, environmental change, urbanization, immigration, and cultural formation.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4232 (3) From Absolutism to Revolution in Europe, 1648-1789

Studies the history of Europe from the end of the Thirty Years War through the outbreak of the French Revolution. Central themes include the establishment of more centralized, increasingly bureaucratic states; global expansion and economic commercialization; cultural developments such as the Scientific Revolution and the Enlightenment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1123.

Additional Information: Departmental Category: Europe: Modern

HIST 4233 (3) History of France since 1815

Examines the ongoing struggle between the revolutionary and counter-revolutionary traditions of France and how it shaped the political history and affected the social, cultural and intellectual character of the nation from 1815 to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4235 (3) Jacksonian America

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5235

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4238 (3) History of Southern Africa

Examines the history of southern Africa history from the earliest times to the present. Short background readings and lectures cover southern African's history and class discussions of novels are layered over these basics. Topics of study include Cecil Rhodes and the diamond/gold mines; Shaka and the Zulu "nation"; apartheid; Nelson Mandela and the anti-apartheid movement; issues facing South Africa today.

Requisites: Requires prerequisite course of HIST 1218 or HIST 1228 or HIST 3020 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4258 (3) Africa under European Colonial Rule

Looks at the British, French, Portuguese and German empires that undertook the "Scramble for Africa" in the late 19th century. Themes include slavery and the slave trade; colonization and "pacification"; African resistance to European rule; missionaries and converts; decolonization and anti-colonial uprisings; issues facing Africa today, including oil, war and the Rwandan genocide.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1218 or HIST 1228 or HIST 3020 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4303 (3) Venice and Florence during the Renaissance

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5303

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4312 (3) 19th Century Europe

Concerned with major social, political and cultural developments in Europe from circa 1800 to the outbreak of World War I. Special emphasis is placed upon the Napoleonic experience, the rise of modern nationalism, romanticism, Darwinism and its social applications, the Industrial Revolution, imperialism, the emergence of modern ideologies, and the background of World War I.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4313 (3) History of Modern Italy

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4250

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4315 (3) Civil War and Reconstruction

Describes the forces at work in the antebellum period that led to sectional warfare; social, economic, and political changes effected by the war; the American agony of reconstruction; and the long-range results of that difficult era.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4320 (3) The History of the Mediterranean, 1000-1600

Familiarizes students with the Mediterranean ecumene covering concepts such as the Renaissance, the Crusades, traders and travelers, religions and cities. Explores both conflicts (military, confessional) and exchanges (commercial, artistic, scientific) thus helping students think cross culturally, comparatively and thematically. Emphasizes the Mediterranean contribution to historical developments of western Europe, the Middle East, and North Africa.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1061 or HIST 1308 or HIST 4061 or HIST 4071 or HIST 4081 or HIST 4091 or HIST 4711.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4326 (3) Epidemic Disease in US History

Focuses on the impact of infectious epidemic disease on American history, from smallpox and cholera to influenza, AIDS and Ebola. Addresses early depopulation of the Americas; contagion and social upheaval; interpretations of pestilence; social construction of disease; urbanization; doctors and alternative practitioners; public health; prejudice and infection; the ethics of quarantine; public versus individual interests; and the paradox of prevention.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4328 (3) The Modern Middle East, 1600 to the Present

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5328

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1308.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 4329 (3) Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001

Examines the more important movements of reform in Muslim world (including Africa, the Middle East and India) from the 18th century to the present, and their origins and intellectual import. Due to the trans-regional nature of this broad movement of reform, particular attention is paid to how these movements related to local political, economic and social contexts, and how they, in turn, moved across larger networks of oceanic commerce and trade. Concludes with extended case studies of Islamic reformism in modern Egypt and India, and their ultimate influence on the politics of contemporary Islamist movements, especially the intellectual position of Ussama B. Ladin.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1308.

Additional Information: Departmental Category: World Areas: Comparable and General
Departmental Category: Asia Content

HIST 4336 (3) Nineteenth-Century American Thought and Culture

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the early republic to the beginning of the modern era. Addresses developing arguments about democracy, religion, transcendentalism, gender, race, union/disunion, the Darwinian revolution, utopia/dystopia realism and naturalism in literature and the arts.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4338 (3) History of Modern Israel/Palestine

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4338

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 4339 (3) Borderlands of the British Empire

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5339

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528.

Additional Information: Departmental Category: World Areas: Comparable and General
Departmental Category: Asia Content

HIST 4343 (3) Spain and Portugal during the Golden Age

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 4064.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5343

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1018.

Additional Information: Departmental Category: Europe: Topical

HIST 4346 (3) Twentieth-Century American Thought and Culture

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the beginning of the modern era through the onset of the postmodern. Addresses developing arguments about democracy, science, race, gender, faith, American identity, radicalism and conservatism, modernist thinking and artistic expression, and the role of intellectuals in society.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4348 (3) Topics in Jewish History

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4348

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4349 (3) Decolonization of the British Empire

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5349

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528 or HIST 4053 or HIST 4238 or HIST 4258 or HIST 4328 or HIST 4329 or HIST 4338 or HIST 4339 or HIST 4538 or HIST 4548 or HIST 4558.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 4366 (3) Culture Wars: Modernism, Mass Culture, and the Modern U.S.

Examines how U.S. public moralists, intellectuals, and artists from the end of the nineteenth century to World War II both celebrated and attacked the rise of two characteristic features of modernity: mass culture (amusement parks, popular music, radio, movies), and modernist literary and artistic expression. Addresses how Americans both constructed and violated the line between "popular" and "high" culture.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4378 (3) History of Modern Jewish-Muslim Relations

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4378

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4412 (3) Europe, 1890-1945

Examines the origins, character and significance of the First and Second World Wars for the major nations of Europe during the first half of the 20th century.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4414 (3) European Thought and Culture, 1750-1870

Explores major developments in European thought from the Enlightenment to Nietzsche. Special attention given to the individuals whose ideas have had the greatest influence on modern intellectual history, e.g., Rousseau, Hegel, Herder, Marx, Kierkegaard, Baudelaire, Darwin, and others.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4415 (3) Teddy Roosevelt's America - the U.S. from 1877 to 1917

Examines the social, economic, political, and cultural history of the United States from the end of Reconstruction to the eve of World War I. Topics include the struggles of labor and industry, race and immigration, western and environmental issues, city life and new technologies, feminism and Progressivism, and Indian wars and imperialism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025 or ENV5 1000.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4416 (3) Environmental History of North America

Examines how people of North America, from precolonial times to the present, interact with, altered, and thought about the natural world. Key themes include Native American land uses; colonization and ecological imperialism; environmental impacts of food and agriculture; industrialization, urbanization and pollution; energy transitions; cultures of environmental appreciation; the growth of the conservation and environmental movements.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4422 (3) World War I in Europe

Examines the origins of World War I; the military, social and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the 20th century world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5422

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4423 (3) German History Since 1849

Cultural, political and social history of Germany since 1849. Emphasizes German unification, Bismarckian foreign policy, the rise of neoromanticism, Weimar politics and the rise of national socialism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4424 (3) Modern European Thought and Culture, 1870-Present

Emphasizes Nietzsche and the youth revolt against middle class society, the literary and artistic avant garde (impressionism to existentialism), the psychoanalytic movement, the European right and left, and post-WWII European thought.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4425 (3) United States History, 1917-1945

Examines U.S. history from World War I through World War II. Key themes include: warfare; the rise of the modern state; consumer culture; the shift from conservative politics to the New Deal liberalism; the women's movement; immigration restriction; segregation; the Great Migration, and civil rights; conflicts between secular modernism and religious fundamentalism; and new technologies such as the automobile.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4433 (3) Nazi Germany

Focuses on the political, social, cultural, and psychological roots of national socialism, with the nature of the national socialist regime, and those politics and actions that came directly out of its challenge to values central to Western civilization. Studies how Nazism came out of this civilization.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4435 (3) United States History, 1945-1973

Examines the History of the United States during the Cold War, with an emphasis on social and cultural issues at home. Also addresses the economic and political evolution of the American people and the nation's role in world affairs.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4437 (3) African American History, 1619--1865

Explores the history of Africans in America from the first arrivals to emancipation, and their role in the social, cultural, economic, and political evolution of the United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4442 (3) Europe since 1945

Explores Europe from the end of World War II through the present day. Topics include postwar reconstruction; the cold war; anticommunist opposition and new social movements; consumer culture and punk music; the fall of communism; the Yugoslav wars; European unity.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4444 (3) Topics in Modern European Thought

Explores a selected theme in European thought since the Enlightenment. Topics vary each term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4445 (3) United States History since 1973

Traces political, diplomatic, economic, and social developments in the United States from 1973 to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4454 (3) Jewish Intellectual History

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4454

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4511 (3) Europe in the Dark Ages (400-1000 A.D.)

Examines the history of Europe from the fall of the Roman Empire to the turn of the first millennium. Treats social, political and religious transformations in the barbarian kingdoms, and considers the persistence of Roman institutions and culture and the impact of Christianity in northern Europe.

Requisites: Requires prerequisite course of HIST 1011 or HIST 2170 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4516 (3) U.S. Society in the 19th Century

Concerned with the American family and community in the changing social environments of the 19th century. Examines families of different ethnic and class backgrounds, observing how they are changed by new economic conditions, reform, or new political institutions.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4521 (3) Europe in the High Middle Ages (1000-1400 A.D.)

Examines the history of Europe from the emergence of feudal institutions to the rise of nation states, with specific attention to social, intellectual and religious change, the role of law and ritual, the crusades and European expansion, and urban growth and identity in the West.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 2170.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4526 (3) Immigrants, Workers and the 1 percent - Recent U.S. Social History

In the 21st century we see a widely divided U.S. society, with a privileged "one percent" on one end, and a striking pattern of poverty on the other. How did the U.S. get this way? This course shows students how to explore social change through the people of the 20th century, their experiences, and the words they left behind.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4527 (3) Mexican-American History since 1848

Examines Mexican-origins people in the United States from the 19th century through the present. Focuses on Mexican-American history as both an integral part of American history and as a unique subject of historical investigation. Using primary and secondary sources, students will examine how Mexicans and Mexican-Americans have negotiated, influenced, and responded to political, social, cultural, and economic circumstances in the U.S.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4528 (3) Islam in South and Southeast Asia (1000 to the Present)

Examines the history of Muslim societies in South and Southeast Asia from 1000 to the present. Focuses on themes such as the rise of Islamic empires in South Asia, Sufism, trade and the spread of Islam in Southeast Asia, the rise of Muslim nationalism and religious fundamentalism, and the impact of modernization and globalization on Muslims of the region.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Requisite 6 hours of any history coursework.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 4534 (3) Modern European Jewish History

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4534

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Europe: Topical

HIST 4538 (3) History of Modern India

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5538

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite 6 hours of any history coursework.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 4544 (3) History of Yiddish Culture

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5544 and JWST 4544

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HEBR 2350 or JWST 2350.

Additional Information: Departmental Category: Europe: Topical

HIST 4546 (3) Popular Culture in the Modern United States

Traces the history of cultural expression in the United States since the late nineteenth century. From art, fiction, and music to the movies, amusement parks, shopping, and sports, popular culture offers clues to decipher shifting patterns of consumption, globalization, race, gender, politics, technology, and media. Includes instruction and practice interpreting cultural materials in historical context.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025 or ATLS 2000.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4548 (3) Women in Modern India

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5548

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1528.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4556 (3) The History of America through Baseball

Baseball serves as a window to view the American experience. Covers U.S. history since 1830, addressing the major topics that reflect on American society, such as professionalization, labor management conflict, race, gender, culture, politics, economics and diplomacy.

Equivalent - Duplicate Degree Credit Not Granted: HIST 2516

Requisites: Requires prerequisite course of HIST 1025 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4558 (3) Buddha to Gandhi: A History of Indian Nonviolence

Focuses on the intellectual history of nonviolence in India from the time of the Buddha to Mahatma Gandhi who led India to national independence from the British Empire in 1947. Pursues this history in light of the encounter between Indian and western cultural traditions in modern India.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4616 (3) History of Gender and Sexuality in the United States to 1870

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5616 and WGST 4616

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4617 (3) Native North American History I: Human Settlement to 1815

Explores the establishment and development of human societies in North America prior to 1492; the varied experiences of contact; the crises, opportunities, and transformations that attended colonialism; Indians and the inter-imperial contests of the eighteenth century; and the struggles of native peoples confronting the newly-independent United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4618 (3) Early Modern China, 960-1842

Examines political, social, and cultural history of China from the Song Dynasty (960-1279) to the opium War (1839-1842). Topics covered include the development of imperial political institution and gentry society, Conquest Dynasties, Neo-Confucianism, China's "medieval economic revolution", Chinese world order in East Asia, Qing multiethnic empire, Chinese overseas migration, and the coming of the West.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4619 (3) Women in East Asian History

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4619 and HIST 5619

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 4620 (3) A Global History of Sexuality: The Modern Era

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4620

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4623 (3) History of Eastern Europe Since 1914

Examines the struggle of nations of eastern Europe to assert their independence, from break-up of the imperial system at the end of World War I, through the Soviet bloc that emerged after World War II, to the establishment of democratic governments after the 1989 revolutions.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4626 (3) History of Gender and Sexuality in the United States from 1870

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4626

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4627 (3) Native North American History II: 1815 to Present

Explores the longevity and continuity of human history in North America by discussing pre-European social and cultural developments. By examining ways in which Indian societies west of the Mississippi River responded to Euro-Americans, the Indians' role in western North American history is demonstrated.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics as Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5628

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the United States through investigation of lesbian/gay identity formation, community development, politics, and queer cultural resistance.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5636 and WGST 4636

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025 or LGBT 2000.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4638 (3) Contemporary China: Radicalism and Reform, 1949 to Present

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5638

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4640 (3) Women, Gender and War

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4640

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1012 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4643 (3) Poland since the 16th Century: Democracy and Nation

Traces themes of democracy and nationalism in Polish history from the "Noble Republic" of the early modern era through the struggles with fascism and communism in the 20th century, to Poland's current position on the eastern edge of Western Europe.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4648 (3) Inventing Chinese Modernity, 1800 to Present

Examines the long and painful transformation, during the modern period of native Chinese concepts about the meaning of life, the proper order of politics and society, the role of the individual, the nature and role of human emotions, the place of the gods, the definition of nation, the proper relations between the sexes, and China's place in the global order.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4658 (3) China and Islam from the 7th Century to the 20th Century

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5658

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4688 (3) Window on Modern China

Examines the relationship between China's recent history and its booming contemporary economy and society through on-location study in a Chinese city. The course makes use of a rich array of historical and other kinds of sites to teach students to think critically about themes and events that played a shaping role in the unfolding of modern Chinese history.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4711 (3) The Medieval Crusades: Holy War and Its History, 1095-1400

Studies the innovation, impact and meaning of holy war and the expansion of Christendom during the High Middle Ages. Topics include the definition of crusade and crusaders, religious persecution and tolerance, the expansion of European modes of government, war memory, colonization and its aftermath, the meaning of the Holy Land and the home front.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 2170.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4713 (3) History of Russia through the 17th Century

Introduces the history and culture of Russia from the 9th to the 17th century. Emphasizes selected topics in social, economic, religious and cultural history, including the formation of the Russian state conversion to Orthodox Christianity, the Mongol invasion and the reign of Ivan the Terrible.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4718 (3) Ancient, Classical, and Medieval Japanese History

Begins with the prehistoric and protohistoric periods. Explores the development of Japan's classical age and traces the rise and attenuation of an elite warrior government.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4723 (3) Imperial Russia

Surveys major cultural, social, and economic changes from the reign of Peter the Great through World War I.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4726 (3) A Nation of Immigrants: Immigration in American History

Examines the shifting kaleidoscope of immigration to the United States in the 19th and 20th centuries. Considers immigrant motives, cultures and experiences; changing cultural and political ideas about the value of immigration; the relationship of immigration and immigration policy to ideas about the American national project; the creation and consequences of immigration law.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4728 (3) Modern Japanese History

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5728

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4733 (3) The Russian Revolution and the Soviet Regime

Covers in detail the significant social, economic and political events of Soviet Russia from the February Revolution of 1917 to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4738 (3) History of Early Modern Japan (1590-1868)

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

Equivalent - Duplicate Degree Credit Not Granted: HIST 5738

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4758 (3) The History of Postwar Japan, 1945 to Present

Explores political, economic, social and cultural factors in postwar Japan. Although the defeat in 1945 is often seen as "zero hour", a moment of near total disjunction, the outlines of postwar Japan emerged during World War II. Beginning with the 1930s, traces growth and development, social change, globalization, the quest for collective identity and other themes in the evolving Japanese nation-state.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5761 and CLAS 4761 and CLAS 5761

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4800 (3) Special Topics in Global History

Organized around themes that change yearly, this class allows students to study and research processes, phenomena, and events of global significance in historical context. Will stress historical subjects that span multiple geographic regions of the globe. Topics could include the global history of: the arms trade; slavery; health and disease; youth culture; women's rights; genocide, the environment, migration, economic trade, warfare exploration etc...

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4803 (3) Special Topics in European History

Covers specialized topics in European history, usually focusing on a specific country or theme.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4808 (3) Special Topics in World Areas History

Covers specialized topics in the history of World Areas outside of Europe and/or North America, usually focusing on one country or region.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4820 (3) Human Rights: Historical Perspectives

Examines the history of modern ideas of human rights. Focuses on themes such as the universalism/cultural relativism debate, colonialism, nationalism, refugees and stateless peoples, the United Nations and humanitarianism, ethnic genocide in Rwanda, and human rights abuses by the Taliban regime in Afghanistan.

Requisites: Requires a prerequisite of 6 hours of credit in any History course. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4827 (3) Modern U.S. Jewish History since 1880

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4827

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4930 (1-6) History Internship

Matches selected students with supervised internships in professional archives research libraries, historical associations, and special projects. Interns apply their academic area specialty to their work in the field.

Internships have a work and academic (reading and writing) component. **Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) History (HIST) majors and minors only.

Recommended: Prerequisite completion of lower-level history coursework (for example HIST 1015 or HIST 1025).

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Methodological, Comparative, and Global

History - Bachelor of Arts (BA)

As a history major studying the past, you will gain an awareness of the variety of past human achievement, as well as a perspective on how the world operates. With this knowledge, you will have a better understanding of the present. In the course of exposing you to the intellectual, political, economic, cultural, and social forces that have influenced today's world, the study of history also develops your ability to read critically, to ask intelligent questions, and to express ideas orally and in writing. In its broadest sense, the study of history provides you with an intellectual framework and practical skills that will serve all your future pursuits.

The bachelor of arts (BA) program for history majors is structured so that while you are required to receive a broad education in various fields of historical inquiry, you have the freedom to design a program particularly suited to your own interests, provided you choose your classes wisely.

At the lower-division level, you are required to take one introductory course on the history of the United States, on the history of Europe, on the history of another area of the world outside of the U.S. or Europe, and on global history. At the upper-division level you have greater flexibility because you take more courses, but you also have to take one class on U.S. history, on European history, on the history of another area of the world outside of the U.S. or Europe, and on comparative or global history.

In addition, when choosing courses to fulfill your major requirements, you need to make sure that you take at least two pre-modern history courses and two modern history courses.

While you are required to acquire both geographical and chronological breadth in your major, the requirements are flexible enough that you can concentrate your studies in a specific geographic area (for example Britain, China, Latin America, or the U.S.) or a historical period (for example the Ancient world, the Medieval period, or the twentieth century) or on a single theme (for example intellectual history, the history of revolution, the history of women, imperialism and colonialism, the history of Islam, or Jewish history). Within these areas, you are free to plan your program around a diverse set of rotating course offerings.

An objective of the program is to provide as broad a base as possible for the curriculum. The following historical areas are among those represented: ancient and medieval history; early modern & modern European history; European national histories (Britain, France, Germany, Russia); the history of world areas (Latin America, Africa, the Middle East, South Asia & East Asia); American history considered both by periods and by topics (such as diplomatic, social, African-American); Western U.S. history; women's history; global history, and different historical methodologies.

All majors are required to take a specific historical thinking & writing course, but in all coursework, special attention is paid to skills in critical reading and writing. You are expected to work with source materials, acquire methodical research techniques, and submit clearly written papers and essays. The department encourages students with great interest and ability in history to take part in the departmental honors program. Qualified students usually complete the honors program during their senior year but, some start their history honors work during their junior year.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Total Credit Hours

Students must complete 42 credit hours in history courses with grades of C- or better. Of those 42 credit hours, 24 must be at the upper division. Students should complete the required 1000-level survey courses, HIST 1800 (or an equivalent 1000-level Global Comparative Course) and HIST 3020, before the end of their sophomore year and before they enroll in any 4000-level history courses.

Required Courses and Semester Credit Hours

Lower-division Requirements

One 1000-level United States history course - 3 credits	3
One 1000-level Europe history course - 3 credits	3
One 1000-level world areas history course - 3 credits	3
HIST 1800 Introduction to Global History (Or an equivalent 1000-level Global Comparative Course.)	3

Upper-division Requirements

HIST 3020 Historical Thinking & Writing	3
One 4000-level United States history course	3
One 4000-level Europe history course	3
One 4000-level world areas history course	3
One 4000-level comparative or global history class	3
Two 4000-level HIST electives	6
One 3000-level Senior Seminar ¹	3

Lower- or Upper-division Elective Requirement

6 credit hours in any other HIST courses	6
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Historical Period Requirement ²

6 credit hours in courses whose focus falls primarily before 1800	6
6 credit hours in courses whose focus falls primarily after 1800	6

Ancillary Written Communication Requirement ³

Select one of the following lower-division written communication courses:

ARSC 1080 College Writing and Research	3-4
ARSC 1150 Writing in Arts and Sciences	
CLAS 1020 Argument from Evidence: Critical Writing about the Ancient World	
ENGL 1001 Freshman Writing Seminar	
PHIL 1500 Reading, Writing and Reasoning	
WRTG 1100 Extended First-Year Writing and Rhetoric	
WRTG 1150 First-Year Writing and Rhetoric	
WRTG 1250 Advanced First-Year Writing and Rhetoric	

Total Credit Hours

57-58

- ¹ Any additional 3000-level seminars can fulfill requirements that normally are fulfilled by 4000-level courses.
- ² 2000-level non-major HIST courses cannot be used to fulfill this requirement. (The department maintains a list of courses broken down by geographic areas and historical periods.)
- ³ Complete with a grade of C- or better.

NOTE: Under normal circumstances, no more than 45 credit hours in history may be used toward a student's total University of Colorado Boulder graduation requirements. Students must have a grade point average of at least 2.00 in the major in order to graduate. Students may receive credit for HIST 1012 and/or HIST 1025 and/or 3 lower-division elective HIST credit hours by obtaining a score of 4 or better on the high school Advanced Placement history test(s). Some types of International Baccalaureate credit are acceptable; consult one of the major advisors to determine individual applicability. The CLEP test is not accepted for credit.

All students majoring in history must complete at least 12 credit hours of upper-division history in courses taught by the CU Boulder faculty. In addition, HIST 3020 and the 3000-level Senior Seminar must be successfully completed on the CU Boulder campus with a C- or better.

Graduating in Four Years

Students should consult the Four-Year Guarantee Requirements for further information on eligibility for the four-year guarantee. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in history, students must consult a history advisor each semester, but the following plan provides a rough outline of acceptable progress:

- Declare the major no later than the second semester of the freshman year.

Recommended Sequence of Courses

Course	Title	Credit Hours
Year One		
Any two of the required 1000-level HIST survey courses		6
Ancillary lower-division written communication course		3
	Credit Hours	9
Year Two		
The third required 1000-level HIST survey course		3
A 1000- or 2000-level HIST elective		3
HIST 1800	Introduction to Global History	3
HIST 3020	Historical Thinking & Writing	3
	Credit Hours	12
Year Three		
Four 4000-level HIST lecture courses		12
	Credit Hours	12
Year Four		
Three 4000-level HIST lecture courses		9

One 3000-level Senior Seminar	3
Credit Hours	12
Total Credit Hours	45

History - Minor

Students who wish to take several history courses may want to consider becoming either a History Major or a Minor. In general the Major requires a more in-depth commitment from students whereas the Minor offers students an opportunity for some specialization in History without all the obligations of the Major.

For those students already pursuing a Major in another field, a History Minor might be the more viable option because the Minor requires the completion of fewer overall history courses.

Requirements

2000-level HIST courses and courses taken for core curriculum credit are applicable to the minor. 4000-level courses may be used to fulfill both upper-division credit hours and geographic area credit hours.

HIST 3020 and all 3000-level Senior Seminars are restricted to history majors. 3000-level courses may occasionally be taken by minors if the course is not full as of the second week of drop-add and/or you have written permission from the instructor.

Required Courses and Semester Credit Hours

A total of 21 credit hours in history, of which at least 12 credit hours must be upper-division. Courses intended to count for the minor may not be taken on a pass/fail basis, and students must earn a C- or better in any course to be counted toward the 21-credit-hour minor requirement.

At least 3 credit hours (one course each) must be taken in each of the four following geographical areas: the United States, Europe, World Areas (specific areas outside of Europe and North America) and Global or Comparative.

Humanities

Humanities is an interdisciplinary program that allows students to combine different fields of study from all the disciplines of the humanities as well as from the social sciences (in particular, Anthropology, Ethnic Studies, Political Science, Psychology, Sociology, Women and Gender Studies). This major especially encourages students to develop their interdisciplinary interests in fields of cultural and humanistic expression such as literature, art, music, film, philosophy, history, modern media, religion and contemporary critical practice and theory.

The undergraduate degree in humanities emphasizes knowledge and awareness of:

- the ways cultures and traditions define both themselves and each other;
- the formal, rhetorical and ideological properties of cultural texts in a variety of forms and media (literature, history, philosophy, film, music, visual arts, architecture, dance, theatre, performance);
- the dynamic relationships between texts and their social and historical contexts;

- the genres and modes of texts and their production, transformation and reception; and
- the theoretical and ideological underpinnings and implications of one's own and others' interpretive approaches and assumptions.

In addition, students completing the degree in humanities are expected to acquire the ability and skills to:

- analyze and interpret texts in a variety of forms and media;
- articulate such analyses and interpretations at a sophisticated level in both written and oral forms;
- discern similarities and differences among individual works, artistic media, historical periods and cultural traditions;
- reason critically; and
- explore the connections between contemporary issues and academic work.

Course code for this program is HUMN.

Bachelor's Degree

- Humanities - Bachelor of Arts (BA) (p. 389)

Minor

- Humanities - Minor (p. 390)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bernardini, Giulia (https://experts.colorado.edu/display/fisid_143777)
Instructor

Carnahan, Shirley E (https://experts.colorado.edu/display/fisid_105936)
Senior Instructor; PhD, University of Colorado Boulder

Cox, Jeffrey N (https://experts.colorado.edu/display/fisid_113253)
Professor; PhD, University of Virginia

Eddy, Marjorie Alexandra (https://experts.colorado.edu/display/fisid_111634)
Lecturer

Ferris, David S (https://experts.colorado.edu/display/fisid_116817)
Professor; PhD, SUNY at Buffalo

Gordon, Paul (https://experts.colorado.edu/display/fisid_100661)
Professor; PhD, Yale University

HUMN 1110 (3) Introduction to Humanities: Literature 1

Introduces students to works from the major Western literary periods (Classical, Medieval, Renaissance, Baroque) from the 8th c. BC to the early 17th c. AD comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinary, genre studies, periodization, comparativism, thematology, hermeneutics, criticism, etc.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1120 (3) Introduction to Humanities: Literature 2

Introduces students to works from the major Western literary periods (Baroque, Enlightenment, Romanticism, Realism, Modernism) from the 17th- through the 20th-centuries comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinarity, genre studies, periodization, comparativism, thematology, hermeneutics, criticism.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1210 (3) Introduction to Humanities: Art and Music 1

Examines the major artistic and musical works in the Western tradition from ancient Greece through the 16th century in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1220 (3) Introduction to Humanities: Art and Music 2

Examines the major artistic and musical works in the Western tradition from the 17th century to 21st-century post-modernism in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1400 (3) Mediterranean Foundations

Examines the pre-Modern Mediterranean as the foundational zone of Western Humanism and culture, beginning with Classical Antiquity and through to the dawn of Modernity. Through history, art, literature and thought, it studies the region's role as the crucible of Helleno-Persian culture, Roman society, of Judaism, Christianity and Islam, the intersection of Europe, Africa and Asia in the development of Modernity.

Grading Basis: Letter Grade

HUMN 1701 (3) Nature and Environment in German Literature and Thought

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green party.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1701

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 2000 (3) Methods and Approaches to the Humanities

Provides a transition from the introductory courses to the upper-division courses. Introduces the various technical methods and topics encountered in the department's comparative, interdisciplinary upper-division courses, including cultural studies, rhetoric, translation, hermeneutics, word/image studies.

Requisites: Restricted to Humanities (HUMN) majors and minors only.

HUMN 2100 (3) Arts, Culture and Media

Promotes a better understanding of fundamental aesthetic and cultural issues by exploring competing definitions of art and culture. Sharpens critical and analytical abilities by asking students to read and compare different theories about arts, culture, media, and identity, and then to apply and assess those theories in relation to a selection of visual and verbal texts from a range of cultural and linguistic traditions.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 2145 (3) African America in the Arts

Introduces interrelationships in the arts of African Americans and the African American contribution to American culture as a whole.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

HUMN 2601 (3) Kafka and the Kafkaesque

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2601

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3092 (3) Studies in Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3093 (3) Topics in Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3104 (3) Film Criticism and Theory

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3104

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

HUMN 3200 (3) Fictions of Illness: Modern Medicine and the Literary Imagination

Examines the ways in which the rise of modern medicine fueled the literary imagination with a new focus, new patterns of perception and potent metaphors. Through a study of various works of fiction, critical theory and medical history, the course traces how medical discoveries and the increasing professionalization of medicine manifested itself in modern literature.

Requisites: Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

HUMN 3210 (3) Narrative

Explores the nature of sacred and secular narrative in literature, film, and the visual arts.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3211 (3) The Craft of Mystery

Explores examples of and theories about the formation and growth of the genre of detective fiction, especially in the late 19th and early 20th centuries. Explores the social conditions of the times in which the texts were written and the possible resulting influences on style. Compares the texts and theories to examples from other genres and time periods.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3212 (3) Shipwrecks, Mutinies, and Other Catastrophes at Sea

Explores the theatrical analogy that frames our understanding of catastrophes at sea and their literary and visual representation, paying particular attention to issues of gender, race, and sexuality, which are intentionally banned from such representations, but turn out to be their secret focus.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3240 (3) Tragedy

Studies some of the great tragic works of art, music, and literature from the Greeks to the 20th century. Tragic theory is invoked as an aid to interpretation.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3290 (3) Foundations of Disability Studies

Introduces students to the interdisciplinary field of disability studies by investigating key concepts in disability theory, disability history and culture, media representations of people with disabilities, and pertinent bioethical issues.

HUMN 3310 (3) The Bible as Literature

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3310 and JWST 3310

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 3321 (3) Culture and Literature of Ancient China

Focuses on the religious, cultural, philosophical, and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 3321

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Asia Content

HUMN 3341 (3) Literature and Popular Culture in Modern China

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 3341

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Asia Content

HUMN 3500 (3) Literatures of Consciousness

Facilitates a complex and productive understanding of consciousness by analyzing and synthesizing interdisciplinary works (including literature, film and theoretical and scientific texts). This interdisciplinary approach enables students to think deeply about the following questions: what is consciousness? How do we think and perceive? What does it mean to be "neurotypical"? What does all of this have to do with who we are?

Requisites: Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 3505 (3) The Enlightenment: Tolerance and Emancipation

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3505

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 3640 (3) Modernisms: Art and Theory from 1900 to 1960

Offers an introduction to Modernism in various media, emphasizing in particular the historical development of the visual arts from German Expressionism and Cubism to Neo-Dada and Pop Art. Readings in literature will include Proust, Beckett, Blanchot and poets associated with various art movements. Theoretical readings range from Saussure and Freud to Adorno and Jameson. Recommend prerequisite: HUMN 2000.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 3660 (3) The Postmodern

Analyzes the cultural and critical practices as well as the thought that defines the postmodern period at the end of 20th century.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3660

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3702 (3) Dada and Surrealist Literature

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3702

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3802 (3) Politics and Culture in Berlin 1900-1933

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3802

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 3811

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Asia Content

HUMN 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 3841

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Asia Content

HUMN 3850 (3) The Mediterranean Religion Before Modernity

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3850

Additional Information: Arts Sci Core Curr: Historical Context

HUMN 3860 (3) Politics and the Arts in the Information Age

Examines the political aspects of the art and literature of the information age, with a focus on conceptual practices since 1965. The course investigates political theories of art along side sculpture, performance, installation, poetry, and graphic design.

Recommended: Requisite HUMN 2000 or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3930 (1-6) Humanities Internship

Students gain academic credit and professional experience working in museums, galleries, arts administration, and publishing. They work 3-18 hours per week with their professional supervisor and meet regularly with a faculty advisor who determines the reading and writing requirements. An interview with faculty advisor is required.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 3935 (1-3) Humanities Internship: Literature and Social Violence

See HUMN 4835.

Requisites: Requires enrollment in corequisite course of HUMN 4835.

HUMN 4000 (3) The Question of Romanticism

Interdisciplinary study of literature, art, and music from 1780 to 1830 in France, England, and Germany.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4004 (3) Topics in Film Theory

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topics, establishing critical dialogue with the primary materials.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4004 and ARTF 5004

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 3051 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Film (FILM or FMST) or Humanities (HUMN) majors only.

HUMN 4010 (3) Hitchcock and Freud

Applies Freudian psychoanalysis to the films of Alfred Hitchcock. Students will familiarize themselves with the Freudian methodology by reading a number of books and essays and then apply both Freud's general ideas as well as specific texts to particular aspects, both formal and contentual, of his films. Particular attention will be given to the important field of "feminism and psychoanalysis" as it relates to the study of the role of women in Hitchcock's films.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 4011 (3) The Criminal-Hero

Studies various theories of literary transgression by Aristotle, Nietzsche, Freud, Bataille and others to understand the many works, beginning with Genesis and the Iliad and including contemporary works such as Norman Mailer's *The Executioners Song* and the films of Herzog (*Aguirre, Nosferatu*) and Scorsese (*Taxi Driver, Cape Fear*) which feature this paradoxical figure.

HUMN 4020 (3) Reading, Chance, and Guessing

Considers the method of the humanities as opposed to those of the natural and social sciences, especially in view of their respective ability or claim to predict the future and to master chance.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4030 (3) The Art of Travel

Examines the art of travel: not where to go and what to do, but rather philosophical concepts about why people travel. Areas of discussion will include exploration, discovery, escape, pilgrimage, the grand tour, expatriotism, exile, nomadism, armchair travel, and the sense of home. Materials will include books by travel writers, novels, films, essays, short stories, art, music, and historical documents.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4050 (3) Representations of People with Disabilities

Examines the representation of people with disabilities in canonical and contemporary literature and drama, and introduces students to disability theory and the history of people with disabilities.

HUMN 4060 (3) Modern Critical Theory

Explores, through guided discussions, the concept of theory itself and how a theory is constructed. Emphasizes the close reading of theory in order to learn to analyze critically, considering theory as something to be thought about rather than simply applied.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4082 (3) 19th Century Art and Literature

Interdisciplinary study of English fiction and poetry together with related movements in visual arts.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4092 (3) Advanced Studies in the Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4093 (3) Advanced Topics in the Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4100 (3) Writing the World in Traditional China

Examines the history and implications of the central role played by writing in pre-modern China, especially with regard to traditional constructions of the world, including relations with aesthetics, the non-human, and the spiritual. Key works of Chinese literature and thought from different periods are studied, with the aim of determining a particular type of Chinese humanism. All readings in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Asia Content

HUMN 4110 (3) Greek and Roman Epic

Students read in English translation the major epics of Greco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4110 and CLAS 5110

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4111 (3) Modern and Contemporary Culture

Examines the legacy of the historical avant-garde (1910-1930) in postwar and contemporary culture: 1945 to the present. We will study the construction of a "neo-avant-garde" in diverse fields (art, film, philosophy) as well as the methodology of "social art history" which, like the artistic neo-avant-garde, critically analyzes the relation between aesthetic production and global capitalism.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Grading Basis: Letter Grade

HUMN 4120 (3) Greek and Roman Tragedy

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4120 and CLAS 5120

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4130 (3) Greek and Roman Comedy

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4130 and CLAS 5130

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4131 (3) The Greek and Roman Novel

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4140 and CLAS 5140

HUMN 4135 (3) Art and Psychoanalysis

Explores psychoanalytic theory as it relates to our understanding of literature, film and other arts. After becoming familiar with some essential Freudian notions (repression, narcissism, ego/libido, dreamwork, etc.), students apply these ideas to works by several artists (e.g., Flaubert, James, Kafka, Hoffmann and Hitchcock).

Equivalent - Duplicate Degree Credit Not Granted: FILM 4135

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4140 (3) The Age of Dante: Readings from The Divine Comedy

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4140 or 4145 or ITAL 4147

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages

Studies Boccaccio's masterpiece, the Decameron, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4150

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Literature and the Arts

HUMN 4155 (3) Philosophy, Art, and the Sublime

Explores philosophies of art, theories of the sublime, and the relation between art and morality through philosophy, literature, and the visual arts. Includes works by Plato, Longinus, Burke, Rousseau, Kant, Mary Shelley, Melville, Friedrich, Turner, and Pollock.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 4170 (3) Fiction and Reality: Literature, Science, and Culture

Explores the significance of how one defines "fiction" and "reality". Begins by defining the core concepts and compares them with related terms.

Lectures and discussions analyze the implications of these concepts from the perspective of a variety of disciplines and in the context of diverse issues in order to develop a critical awareness of them. Reading and writing intensive.

Recommended: Requisite HUMN 2000 and restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4502 (3) Nietzsche: Literature and Values

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4502

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 4504 (3) Goethe's Faust

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4504 and GRMN 5504

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4552 and ETHN 5552

Requisites: Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

HUMN 4555 (3) Interpreting Art

Introduces various methods of interpretation (New Criticism; Reader Response; structuralism, post-structuralism, psychoanalysis, art history, etc.) with which to examine how one determines the meaning of the work of art. Methodologies are studied in close conjunction with particular poems, paintings, stories and films.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4650 (3) Religion, Power, Modernity

Examines the representation of religion in relationship to the claims made by modern narratives of power in fables, literature, graphic novels, visual materials and critical writings.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4730

Additional Information: Arts Sci Core Curr: Human Diversity

HUMN 4811 (3) 19th Century Russian Literature

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4811

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4821 (3) 20th Century Russian Literature and Art

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4821

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4835 (3) Literature and Social Violence

Provides a theoretical understanding of heightened awareness arising from literary and sociological investigations of contemporary sources of social violence (gang culture, racism, domestic violence), combined with the concrete knowledge offered by an internship in a social service agency. Optional internship credit is available.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Contemporary Societies

HUMN 4840 (1-3) Independent Study

May be repeated for a maximum of 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

HUMN 4845 (3) Reading Culture: The Meanings We Make

Analyzes a range of literary and cultural texts through the lens of critical theory in order to come to more understanding of how we are making meaning, how those meanings make us and how we might use that awareness to open new fields of possibility, both in our readings of texts and in our reactions to cultural contexts and conventions.

Grading Basis: Letter Grade

HUMN 4950 (1-6) Honors Thesis

Supervised project on a topic of the student's own choosing. It should demonstrate ability in interdisciplinary (such as literature and art, art and music, film and literature, literature and theory), extensive research, critical thinking, and excellent writing skills. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Humanities (HUMN) majors only.

Humanities - Bachelor of Arts (BA)

The humanities major is an interdisciplinary program designed for students who wish to concentrate in more than one field or discipline. The major leads to a Bachelor of Arts (BA) degree and offers considerable flexibility, but courses should be chosen in consultation with your primary advisor. Areas of concentration include a humanities-related discipline or a single language and its literature. Students interested in preparing for graduate work in comparative literature or other areas requiring extensive language training may want to select the language track option.

Requirements

A minimum of 60 credit hours is required for the major.

Required Courses and Credit Hours

Required Courses

HUMN 1110 & HUMN 1120	Introduction to Humanities: Literature 1 and Introduction to Humanities: Literature 2	6
HUMN 1210 & HUMN 1220	Introduction to Humanities: Art and Music 1 and Introduction to Humanities: Art and Music 2	6
HUMN 2000	Methods and Approaches to the Humanities	3
Upper-division HUMN courses		15

Area of Concentration

Select one of the following: ¹ 18

A single language/literature (English or a foreign language, ancient or modern; first-year language courses may not be counted)

A field related to the humanities, such as history, art history, anthropology, etc.

Secondary Field

Select from one other humanities-related discipline such as fine arts, 12 music, dance, theatre, film, philosophy, foreign language literature (first-year language courses may not be counted), or other discipline ²

Total Credit Hours 60

¹ At least 12 of these 18 credit hours must be taken at the upper-division level.

² There is no upper-division requirement for this area of concentration.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. Because the humanities major is unique in requiring courses from a number of different departments in addition to its own courses, it is imperative that students wishing to graduate in four years declare the major early and meet regularly with a major advisor. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in humanities, students should meet the following requirements:

- Complete the lower-division sequences HUMN 1110–HUMN 1120 and HUMN 1220–HUMN 1220 by the end of the fourth semester.
- Complete at least two lower-division courses in the secondary field and/or area of concentration by the end of the fourth semester.
- Complete 15 of the remaining 42 credit hours at the upper-division level by the end of the sixth semester—at least two of these must be upper-division humanities courses.
- Complete all remaining required courses (no more than 27 credit hours) by the end of the eighth semester.

Humanities - Minor

The depth of critical analysis as well as the breadth of knowledge covered by the humanities program's courses can be a great benefit to students pursuing a variety of other majors in the College of Arts and Sciences, in the Professional Schools and particularly students pursuing a pre-medical or pre-law school program of study. This minor provides students with the kinds of skills and interests that enhance employment opportunities as well as applications to graduate school.

Humanities program courses are designed to train students to understand and analyze critical, historical, social, political and critical issues from different perspectives and to teach students to draw independent conclusions. Our courses also help develop excellent written and verbal communication skills—recognized by the business and scientific worlds as indicators of future innovators as well as indicators of high quality practitioners and researchers across many different fields (media, communications, arts, creative design, marketing, etc.).

Requirements

The minor in humanities offers students the opportunity to take a range of interdisciplinary courses offered by the humanities program faculty. Total: 18 credit hours (9 upper-division).

Required Courses and Semester Credit Hours

Required Courses

HUMN 2000	Methods and Approaches to the Humanities	3
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Electives

Select two of the following:	6
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HUMN 1110	Introduction to Humanities: Literature 1
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HUMN 1210	Introduction to Humanities: Art and Music 1
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HUMN 1120	Introduction to Humanities: Literature 2
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HUMN 1220	Introduction to Humanities: Art and Music 2
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Nine hours of upper-division HUMN courses	9
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Total Credit Hours	18
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Integrative Physiology

Physiology is the field of biology that deals with function in living organisms. The academic foundation of the department is the knowledge of how humans and animals function at the level of genes, cells, organs and systems. Our multidisciplinary curriculum requires students to take foundational courses in anatomy, biochemistry, mathematics, physics, physiology and statistics. With this basic knowledge, students can undertake a flexible curriculum that includes the study of biomechanics, cell physiology, endocrinology, immunology, exercise physiology and neurophysiology. The department also encourages student participation in research.

Students completing a degree in integrative physiology are expected to acquire the ability and skills to:

- read, evaluate and synthesize information from the research literature on integrative physiology;
- observe living organisms and be able to understand the physiological principles underlying function;
- be able to interpret movement and performance data from laboratory measurements; and
- communicate the outcome of an investigation and its contribution to the body of knowledge on integrative physiology.

These goals are achieved by providing a curriculum that comprises required courses and elective experiences. The required courses establish the foundation of knowledge for the discipline, whereas the elective courses provide opportunities to extend this knowledge on selected topics. The elective courses include seminars, independent study and research projects on such topics as aging, applied biomechanics, applied exercise science, behavioral neuroendocrinology, epidemiology, genetics of substance abuse, integrative physiology of aging, integrative vascular biology, locomotion, molecular biology of neurodegeneration, molecular neurogenetics, molecular signaling of neurological disorders, motor behavior, neuromechanics, neurophysiology of movement, reproductive endocrinology, sleep and chronobiology, sleep and development and stress physiology.

For more information, visit the Integrative Physiology (<http://www.colorado.edu/intphys>) website.

Course code for this program is IPHY.

Bachelor's Degree

- Integrative Physiology - Bachelor of Arts (BA) (p. 395)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

- Ahmed, Alaa Abdalla (https://experts.colorado.edu/display/fisid_144736)
Associate Professor; PhD, University of Michigan Ann Arbor
- Bartlett, Jamie Lynn (https://experts.colorado.edu/display/fisid_156740)
Lecturer
- Bustamante, Heidi Margarita (https://experts.colorado.edu/display/fisid_146491)
Instructor; MS, University of Colorado Boulder
- Byrnes, William (https://experts.colorado.edu/display/fisid_100643)
Associate Professor; PhD, University of Wisconsin-Madison
- Carey, Cynthia
Professor Emeritus
- Casagrand, Janet L (https://experts.colorado.edu/display/fisid_100934)
Senior Instructor; PhD, Case Western Reserve University
- DeSouza, Christopher A (https://experts.colorado.edu/display/fisid_107460)
Professor; PhD, University of Maryland College Park Campus
- Dickinson, Arthur L.
Professor Emeritus
- Eaton, Robert
Professor Emeritus
- Ehringer, Marissa A (https://experts.colorado.edu/display/fisid_126595)
Associate Professor; PhD, University of Colorado Denver
- Enoka, Roger M (https://experts.colorado.edu/display/fisid_110122)
Professor; PhD, University of Washington
- Fleshner, Monika R (https://experts.colorado.edu/display/fisid_103304)
Professor; PhD, University of Colorado Boulder
- Foley, Teresa E. (https://experts.colorado.edu/display/fisid_147351)
Instructor; PhD, University of Colorado Boulder
- Fowler, John S.
Professor Emeritus
- Gleeson, Todd T (https://experts.colorado.edu/display/fisid_105480)
Professor; PhD, University of California-Irvine
- Grabowski, Alena Marie (https://experts.colorado.edu/display/fisid_149727)
Assistant Professor; PhD, University of Colorado Boulder
- Heisler, Ruth E (https://experts.colorado.edu/display/fisid_103195)
Senior Instructor; MA, University of Colorado Boulder
- Hobbs, Steven L (https://experts.colorado.edu/display/fisid_143724)
Instructor; PhD, University of Colorado Boulder
- Hoeffler, Charles Albert (https://experts.colorado.edu/display/fisid_153384)
Assistant Professor; PhD, University of Arizona
- Johnson, Thomas E (https://experts.colorado.edu/display/fisid_104242)
Professor; PhD, University of Washington
- LaRocca, Thomas J (https://experts.colorado.edu/display/fisid_143989)
Instructor; PhD, University of Colorado Boulder
- LeBourgeois, Monique Katherine (https://experts.colorado.edu/display/fisid_148411)
Assistant Professor; PhD, University of Southern Mississippi
- Link, Christopher D (https://experts.colorado.edu/display/fisid_109073)
Associate Professor; PhD, University of Massachusetts at Amherst
- Lowry, Christopher (https://experts.colorado.edu/display/fisid_143371)
Associate Professor; PhD, Oregon State University
- Lynch, G. Robert
Professor Emeritus
- Mazzeo, Robert (https://experts.colorado.edu/display/fisid_101031)
Associate Professor; PhD, University of California-Berkeley
- McQueen, Matthew B (https://experts.colorado.edu/display/fisid_143785)
Associate Professor; DSc, Harvard University
- Mood, Dale P.
Professor Emeritus
- Moore, Russell (https://experts.colorado.edu/display/fisid_105756)
Professor; PhD, Washington State University
- Nelson, Suzanne Linn (https://experts.colorado.edu/display/fisid_142847)
Instructor; MA, University of Colorado Boulder
- Norris, David O.
Professor Emeritus
- Robichaux, Waldean
Professor Emeritus
- Saul, Leif J (https://experts.colorado.edu/display/fisid_116130)
Senior Instructor; PhD, University of California-Berkeley
- Seals, Douglas R (https://experts.colorado.edu/display/fisid_103375)
Professor; PhD, University of Wisconsin-Madison
- Sherwood, David (https://experts.colorado.edu/display/fisid_105516)
Associate Professor; PhD, University of Southern California
- Shi, Jia (https://experts.colorado.edu/display/fisid_143673)
Instructor; PhD, Boston University
- Stitzel, Jerry A (https://experts.colorado.edu/display/fisid_102954)
Associate Professor; PhD, Johns Hopkins University
- Tsai, Pei-San (https://experts.colorado.edu/display/fisid_115292)
Professor; PhD, University of California-Berkeley
- Wright, Kenneth P (https://experts.colorado.edu/display/fisid_125586)
Professor; PhD, Bowling Green State University

IPHY 1950 (3) Introduction to Scientific Writing in Integrative Physiology

Provides an overview of writing skills and strategies, emphasizing those most important to the sciences, especially physiology. Focuses on fundamental skills, objective analysis, and scientific persuasion, with attention to clear organization and style, academic and scientific mechanics, and distinctions between audiences.

Requisites: Restricted to students with 0-86 credits (Freshmen, Sophomore or Juniors) only.

Additional Information: Arts Sci Core Curr. Written Communication MAPS Course: English

IPHY 2010 (1-3) Seminar in Integrative Physiology

Introduces a small group of lower-division students to current research topics in integrative physiology. Emphasizes relevant applications to real-world situations.

Repeatable: Repeatable for up to 6.00 total credit hours.

IPHY 2400 (2) Introduction to Medical Terminology for Future Health Professionals

Provides an introduction to medical terminology used within the health professions. Word roots, prefixes and suffixes used in medical records for major body systems will be examined and explained. The structure and functions of the major systems will be defined and described. Recommended for IPHY students and students interested in pursuing a career in the health professions. No prerequisites required.

Grading Basis: Letter Grade

IPHY 2420 (3) Nutrition for Health and Performance

Focuses on the basic anatomy, physiology, and chemistry of nutrition. Topics include weight management, the role of diet and lifestyle in disease prevention, specific nutrient deficiencies and toxicities, nutrition standards and guidelines, sports nutrition recommendations, agricultural practices, and food policy issues. IPHY juniors or seniors are excluded from taking this course.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 3400

Requisites: Restricted to non-IPHY majors or IPHY freshmen/sophomores (students with 0-56 credits) only.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

IPHY 2500 (1) Perspectives in Health and Medicine

Designed to increase awareness of issues that surround international and U.S. health care. Provides broad overview of topics relevant to 21st century medical practice. Includes guest lectures by faculty and practitioners from Denver Metro region, followed by opportunities to integrate new concepts using small group discussion and writing. Topics change each semester and may include: global development and health; socio-cultural issues in health care; health disparities; applied bioethics; health care system reform; narrative medicine.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Pass/Fail

IPHY 2750 (3) Introduction to Exercise Psychology

Focuses on how psychological factors influence exercise and motor performance in both clinical and sport settings. Major topics include motivation, arousal, stress, imagery, self-confidence, concentration and burnout. Principles of psychological skills training are also discussed.

IPHY 2800 (4) Introduction to Statistics

Examines the application of statistics to research relevant to integrative physiology. Includes instruction and hands-on experience with related computer programs and interpretation of the results of their use.

Requisites: Restricted to Integrative Physiology (IPHY) majors only.

Recommended: Prerequisite MATH 1300.

IPHY 2910 (1-6) Practicum in Integrative Physiology

Offers practical experience in organized situations with direct supervision.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

IPHY 3010 (1-2) Teaching in Integrative Physiology

Provides an opportunity to assist in teaching specific laboratory sections in IPHY under direct faculty supervision. Students must make arrangements with the faculty member responsible for the course in which they plan to assist.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

IPHY 3060 (4) Cell Physiology

Lect. and lab. Introduces the biology of eukaryotic systems at molecular, cellular and systems levels of integration, emphasizing the complementarities of structure and function and physiological mechanisms of regulation at the cellular and molecular level. Department enforced prerequisite: one year of general biology (lecture + lab).

Requisites: Requires prerequisite course of IPHY 3430 or IPHY 3470 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

IPHY 3400 (3) Nutrition for IPHY Majors

Focuses on the science of nutrition, reviewing the basic anatomy, physiology and chemistry of nutrition. Concepts will focus on what the body needs for proper nutrition, how they are obtained, absorbed and processed by the body. Studies will expand to include the following: diet types, nutrition during life stages (i.e. pregnancy), different disease states and real world applications.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 2420

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Recommended: Prerequisite IPHY 3410.

Grading Basis: Letter Grade

IPHY 3410 (3) Introduction to Human Anatomy

Introduces the basics of human anatomy. Department enforced prerequisite: one year of general biology (lecture + lab).

IPHY 3415 (2) Human Anatomy Laboratory

Introduces structures of the human anatomical systems using human cadavers and animal tissue. This laboratory is meant to complement IPHY 3410. Department enforced prerequisites: one year of general biology (lecture + lab) and corequisite: IPHY 3410.

IPHY 3430 (3) Introduction to Human Physiology

Introduces the physiology of the nervous, muscular, cardiovascular, respiratory, urinary, immune, endocrine, digestive and reproductive systems. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Requisites: Requires prerequisite courses of CHEM 1133 and CHEM 1134 or CHEM 3321 and CHEM 3451 (all minimum grade C-). Restricted to non-Integrative Physiology (IPHY) majors only.

Recommended: Prerequisites IPHY 3410 and IPHY 3415.

IPHY 3435 (2) Physiology Lab

Introduces laboratory experience in selected aspects of human and comparative physiology for students in pharmacy and allied health programs. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 2800 (or equivalent); IPHY 3410, IPHY 3415 and IPHY 3430 (prerequisites for majors; recommended courses for non-majors); IPHY 3430 (non-majors only).

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-).

Recommended: Corequisite IPHY 3480 (majors only).

IPHY 3440 (3) Clinical Nutrition

Exploration of clinical nutrition concepts from a health care provider perspective. Examines how and why diseases develop and what nutritional therapy and intervention is appropriate for disease resolution.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Recommended: Prerequisite IPHY 2420.

IPHY 3450 (3) Comparative Animal Physiology

Introduces principles of animal physiology and responses to environmental change. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

IPHY 3460 (5) Comparative Vertebrate Anatomy

Introduces major components of the vertebrate body and how they are organized into a whole organism, emphasizing function, evolution, and diversity of these basic features. Laboratories involve dissection of representative groups and demonstrations. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

IPHY 3470 (3) Human Physiology 1

Focuses on scientific thinking, cell physiology, neurophysiology, endocrinology, immunology and musculoskeletal physiology. First semester of a two-semester sequence for IPHY and NRSC majors only. Department enforced prerequisites: IPHY 3410 and one year of general biology (lecture and lab) and one year of general chemistry (lecture and lab).

Requisites: Requires prerequisite courses of CHEM 1133 and CHEM 1134 or CHEM 3321 and CHEM 3451 (all minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

IPHY 3480 (3) Human Physiology 2

Focuses on the physiology of the respiratory, cardiovascular, urinary, digestive and reproductive systems. The second semester of a two-semester sequence for IPHY and NRSC majors. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3410 and 3415.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Recommended: Corequisite IPHY 3435.

IPHY 3490 (3) Introduction to Epidemiology

Examines the history and uses of epidemiology, measures of disease frequency and occurrence, association and causality, analytic epidemiology, evidence-based screening and outbreak investigations.

Recommended: Prerequisites IPHY 2800 and SOCY 2061 and PSYC 3101.

IPHY 3500 (2) Applied Clinical Research

Introduces fundamental concepts of clinical research to those interested in pursuing a career in medicine or medical research. In addition to lectures introducing students to research design, errors in research and basic biostatistics, there will be significant emphasis on participation in on-going medical research at Denver Health Medical Center and The Children's Hospital. This unique experience will provide students with first-hand exposure to all aspects of clinical research. Department enforced prerequisites: one year of general biology (lecture + lab).

Recommended: Prerequisite CHEM 3111 and premedical focus and/or previous research experience.

IPHY 3580 (3) Sleep, Circadian Rhythms and Health

Examines the history of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidence-based sleep and circadian interventions/preventions in healthy and clinical samples. Department enforced prerequisites: one year general biology plus labs, and one semester of statistics.

IPHY 3660 (3) Dynamics of Motor Learning

Focuses on information processing approaches and dynamical systems theory as explanations for human motor learning and the coordination of movement. Various topics are discussed from both perspectives including practice organization, attainment of elite performance, and the production of novel movements.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

IPHY 3700 (3) Scientific Writing in Integrative Physiology

Takes a process-based approach to writing. Assignments and classroom experiences emphasize critical thinking, using scientific evidence and reasoning to construct original arguments, and applying conventions and problem-solving skills to craft successful documents. Department enforced prerequisite: IPHY 2800 or equivalent.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Additional Information: Arts Sci Core Curr: Written Communication

IPHY 3800 (3) Forensic Biology

Introduces basic concepts of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology, and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

IPHY 3810 (1) Forensic Biology Laboratory

Introduces basic laboratory techniques and procedures of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Recommended: Corequisite IPHY 3800.

IPHY 4010 (1-3) Seminar in Integrative Physiology

Introduces a small group of students to current research topics in integrative physiology, evaluation of current research and discussion of critical issues. Department enforced prerequisite: IPHY 2800 or equivalent.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

IPHY 4200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5200

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

IPHY 4440 (4) Endocrinology

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5440

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

IPHY 4470 (3) Biology of Human Reproduction

Anatomy and physiology of human reproduction, including gender determination, embryology, puberty, menstrual cycle, pregnancy, lactation, menopause, sexual behavior, sexual abnormalities and contraception. Open to nonmajors. Department enforced prerequisites: one year of general biology (lecture + lab).

Recommended: Prerequisites IPHY 3470 and IPHY 3480 (majors) or IPHY 3430 or (non-majors) or IPHY 4440.

IPHY 4480 (3) Comparative Reproduction

Focuses on comparative anatomy and physiology of reproductive system and the evolution of reproductive behavior in vertebrates and invertebrates. Topics include courtship, mating, fertilization, estrous and menstrual cycles and environmental control of seasonal reproduction. Department enforced prerequisite: one year of general biology (lecture + lab).

Recommended: Prerequisite IPHY 3480 (majors) or IPHY 3430 (non-majors).

IPHY 4490 (3) Case Studies in Public Health

Explores case studies in public health in how they have influenced our approach to disease outbreaks and disease resolution. Examines famous case studies in infectious disease, zoonoses and non-infectious diseases, including environmental and occupational exposure to see how they have changed our understanding of disease and responses by health and medical personnel. Examines special populations within public health, as well as discuss modern public health challenges.

Requisites: Requires prerequisite courses of IPHY 3490 (minimum grade D-).

Grading Basis: Letter Grade

IPHY 4540 (5) Biomechanics

Applies the principles of physics and physiology to the analysis of human movement. Quantitative analysis of the forces, torques, mechanical energy, power impulses and momentum associated with human movement. Mechanical properties of muscles, tendons, ligaments and bones. Department enforced prerequisites: PHYS 2010 or PHYS 1110 or IPHY 3410 and IPHY 2800.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Recommended: Prerequisites MATH 1300 or MATH 1310 or APPM 1350 and IPHY 3415.

IPHY 4580 (3) Sleep Physiology

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-).

IPHY 4600 (3) Immunology

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5600

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY), Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Recommended: Prerequisite IPHY 3060.

IPHY 4650 (5) Exercise Physiology

Examines physiological and biochemical adjustments that occur in the body with acute and chronic exercise. Topics center on physiological mechanisms pertaining to metabolic, cardiovascular, and hormonal alterations, the role of exercise in health and disease, soreness and fatigue, immune function, as well as exercise during varied environmental conditions. Department enforced prerequisites: IPHY 2800 or equivalent and IPHY 3480. Department enforced corequisite: IPHY 3410.

Requisites: Requires prerequisite course of IPHY 3470 and 3480 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

IPHY 4660 (3) Critical Thinking in Integrative Physiology

Covers specific integrative physiology topics in areas such as animal physiology, endothelial function, neurobiology, exercise immunology and exercise physiology. Department enforced prerequisite: 13-hours of IPHY coursework.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

IPHY 4680 (3) Critical Thinking in Exercise Physiology

Covers specific exercise physiology topics such as cellular cause of fatigue and muscle soreness, heart disease, regulation of blood flow, diabetes, aging, training adaptations, exercise at high altitude, ergogenic aids and excitation-contraction of muscle. Department enforced prerequisite: IPHY 4650.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

IPHY 4720 (4) Neurophysiology

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5720

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

IPHY 4730 (3) Integrative Motor Control

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5730

Recommended: Prerequisites IPHY 3410 and IPHY 3470.

IPHY 4740 (3) Theory of Motor Skill Learning

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory, and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5740

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 4850 (1) Honors Thesis Seminar

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

Recommended: Prerequisite IPHY 3700, minimum 3.3 GPA and a declared IPHY major and approval by departmental honors committee.

Grading Basis: Pass/Fail

IPHY 4860 (1-6) Independent Study: Undergraduate

Students may register for more than one section per term.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

IPHY 4870 (1-3) Honors Thesis

Department enforced prerequisites: IPHY 2800 and IPHY 3700.

Additional Information: Arts Sciences Honors Course

IPHY 4890 (3) Community-Based Primary Health Care

Introduces models of Community-Based Health Care (CBPHC), relevant research regarding the models and methods of implementation in rural low resource settings. This 3 week summer global seminar in Nicaragua also includes public health data collection in a rural area in conjunction with local health promoters. Provides students with practical skills in the implementation of CBPHC in rural low resource settings.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite GEOG 3692.

Grading Basis: Letter Grade

IPHY 4930 (1-6) Internship

Provides an opportunity for field/laboratory work in a variety of different settings. Consult with faculty for approval. Department enforced prerequisite: completion of at least two of the major core classes.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 4940 (1-6) Application for Clinical Internship

Provides an opportunity for clinical experience in a clinic or hospital setting with which the University has an established Affiliation Agreement. Consult with faculty for approval. Department enforced prerequisite: completion of two 3000-level courses.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Integrative Physiology - Bachelor of Arts (BA)

The integrative physiology program leads to a Bachelor of Arts (BA) degree. The program allows the student to learn the accumulated scientific knowledge about the human body and its responses to physical activity. IP students spend a significant portion of their freshman and sophomore years taking prerequisite course work in biology, chemistry, human anatomy and human physiology, physics and statistics.

In their junior and senior years, students take at least three of the six core courses: biomechanics, cell physiology, endocrinology, immunology, exercise physiology and neurophysiology. In addition, a number of elective courses are offered to complete the degree including independent study, internships and honors work with individual faculty members.

Because of its emphasis on the natural sciences, many students select integrative physiology as a premedical degree since it provides the type of course work required for advanced training in areas such as health, wellness and medicine.

The program provides students with the knowledge, skills and expertise required for advanced training in fields like physical therapy, medicine, osteopathic medicine, dentistry, exercise management, nursing and physiological sciences. A degree in IP also qualifies graduates for other career possibilities in cardiac rehabilitation, chiropractic, geriatrics, physical fitness programming (industrial and corporate) and further scientific training in graduate school.

International Bachelor of Arts

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in Integrative Physiology, in addition to completing all the current requirements for the BA with a major in Integrative Physiology at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Concurrent Degree Program BA/MS in Integrative Physiology

The Department of Integrative Physiology has developed a curriculum that results in simultaneously conferring BA and MS degrees following a five-year course of study. The program has been designed to provide qualified undergraduate students with an opportunity to enhance their knowledge base in the discipline, engage in research, increase their opportunities for employment and make their applications to medical/allied health professional schools more competitive. Candidates for the program are recruited from the undergraduate population of declared integrative physiology majors during the beginning of their junior year. All interested candidates must apply by the second semester of their junior year. To apply, students must have a minimum GPA of 3.30, one letter of recommendation and a faculty mentor. Approximately 3–5 of the applicants will be selected on a competitive basis to begin the program.

Once accepted into the program, a student must maintain a GPA of 3.00 in all course work undertaken. By the completion of their senior year, students must have completed the 116 undergraduate credit hours as outlined in the concurrent degree plan options. Continuing students must register for at least 5 graduate course credit hours per semester, beginning with the fall semester of their senior year. Students deciding to discontinue the program may do so at any time during their course of study. All credit hours completed toward the concurrent degree program will be counted toward the completion of the requirements for a BA degree in integrative physiology.

The curriculum for all students in the first year of the program is the same and is designed for students to complete their undergraduate requirements (116 credit hours) and 8 of their graduate credit hours. To complete the program in five years, students will be allowed to count 6 credit hours of their graduate work as electives for the undergraduate degree and 6 prespecified credit hours of undergraduate work toward the master's degree. See Integrative Physiology - Master of Science (MS) (p. 1024) for more information.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses below. Students must complete a minimum of 38 credit hours, 30 credit hours in courses with the IPHY subject area and 8 credit hours in a biology sequence including requisite labs.

A grade must be earned of C-, or better, for any course applied to the major.

Required Courses and Credit Hours

Required IPHY course work:

IPHY 2800	Introduction to Statistics	4
IPHY 3410 & IPHY 3415	Introduction to Human Anatomy and Human Anatomy Laboratory	5

IPHY 3470	Human Physiology 1	3
IPHY 3480	Human Physiology 2	3
IPHY 3435	Physiology Lab	2
Select three of the following (two of which must be taken at CU Boulder):		11-14
IPHY 3060	Cell Physiology	
IPHY 4440	Endocrinology	
IPHY 4540	Biomechanics	
IPHY 4600	Immunology	
IPHY 4650	Exercise Physiology	
IPHY 4720	Neurophysiology	
<i>IPHY elective course work:</i>		0-2
Required biology sequence:		
Select one of the following biology sequence options:		8
Option 1:		
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
EBIO 1220 & EBIO 1240	General Biology 2 and General Biology Laboratory 2	
Option 2:		
MCDB 1150 & MCDB 1151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab	
MCDB 2150 & MCDB 2151	Principles of Genetics and Principles of Genetics Laboratory	
Required Ancillary course work:		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
PHYS 2010 & PHYS 2020	General Physics 1 and General Physics 2	10
Select one of the following calculus options:		4-5
MATH 1300	Calculus 1	
MATH 1310	Calculus, Systems, and Modeling	
APPM 1350	Calculus 1 for Engineers	
Total Credit Hours		60-66

The number of major elective credit hours needed to reach the 30 credit hour major requirement will vary based on what major courses are taken. Students cannot apply more than 45 major credit hours toward the degree. Contact department for current elective choices.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in integrative physiology, students should meet the following requirements:

- By the first semester, declare the major.
- Before the beginning of the fifth semester, complete the biology and chemistry requirements.
- By the end of the sixth semester, complete the anatomy and physiology requirements.

Students must consult with a major advisor to determine adequate progress toward completion of major requirements.

International Affairs

With the increasing importance of world issues to the United States, employment opportunities in government, international organizations and business continue to expand. Today there is an urgent need for college graduates with a strong background in international affairs. To meet this need, the University of Colorado offers a comprehensive and flexible interdisciplinary program in international affairs leading to the BA degree.

The undergraduate degree in international affairs emphasizes knowledge and awareness of:

- major political, economic, social and cultural problems facing the international community, including international economic relations, world population and resource utilization
- the international political system in the broadest global context, international organizations and alliances, and foreign political systems and processes
- ethical issues involved in international relations
- patterns of conflict and cooperation among nations and peoples
- chief historical factors that give rise to existing international institutions and processes
- problems and issues in United States foreign policy

In addition, students completing the degree in international affairs are expected to acquire the ability and skills to:

- analyze an international problem from a political, economic, historical and cultural perspective
- read, critically evaluate and synthesize information obtained from international affairs literature
- analyze international phenomena critically
- communicate, orally and in writing, findings to other students of international affairs and to a broader audience
- communicate in other cultural contexts through advanced foreign language study

Course code for this program is IAFS.

Bachelor's Degree

- International Affairs - Bachelor of Arts (BA) (p. 401)

Certificates

- Arctic Studies - Certificate (p. 399)
- European Union Studies - Certificate (p. 399)
- Global Environmental Affairs - Certificate (p. 400)
- International Media - Certificate (p. 403)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bearce, David H. (https://experts.colorado.edu/display/fisid_147837)
Professor; PhD, Ohio State University

Chester, Lucy P (https://experts.colorado.edu/display/fisid_126541)
Associate Professor; PhD, Yale University

Kanner, Michael David (https://experts.colorado.edu/display/fisid_100925)
Lecturer

Martin, Jessica Erin (https://experts.colorado.edu/display/fisid_143770)
Instructor; PhD, University of Colorado Boulder

Snyder, Douglas J (https://experts.colorado.edu/display/fisid_154903)
Lecturer

Teitelbaum, Benjamin Raphael (https://experts.colorado.edu/display/fisid_151338)
Instructor; PhD, Brown University

Young, Gregory D (https://experts.colorado.edu/display/fisid_143374)
Instructor

Zeiler, Thomas W (https://experts.colorado.edu/display/fisid_101692)
PhD, University of Massachusetts at Amherst

Zhang, Shuang (https://experts.colorado.edu/display/fisid_151517)
Assistant Professor; PhD, Cornell University

IAFS 1000 (4) Global Issues and International Affairs

Introduces the student to the international affairs program. The course examines political and economic development in several countries in many different world regions. Examines historical trends and development as well as current political and economic issues.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Asia Content

IAFS 3000 (3) Special Topics in International Affairs

Junior or senior level umbrella seminar spanning a variety of topics relevant to the study of international affairs. Subjects addressed under this heading vary according to student interest and faculty availability.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) or Political Science (PSCI) majors only.

IAFS 3010 (3) Islam, Geopolitics and Society: Gender, Identity and Place

Examines Islam, geopolitics and society in various locations throughout the globe, such as Afghanistan, Egypt, France, Germany, India, Indonesia, Iran, Iraq, Ireland, Israel/Palestine, Morocco, Pakistan, Saudi Arabia, Turkey, Yemen, the UK and the US. Addresses issues of gender, identity and place to illustrate the complexity and diversity of social experiences within the milieu of Islam and geopolitics.

Grading Basis: Letter Grade

IAFS 3500 (3) French Connections: Contemporary France and America in Historical Context

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4190

Additional Information: Arts Sci Core Curr: Historical Context

IAFS 3520 (6) Global Seminar: Justice, Human Rights and Democracy in Israel

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4302

Recommended: Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Asia Content

IAFS 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3530 and RLST 3530

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

IAFS 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3600 and GSLL 3600

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Human Diversity

IAFS 3610 (3) Topics in International Affairs and Jewish Studies

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3610

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IAFS 3621 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4481 and RUSS 5481

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

IAFS 3630 (3) Radical Nationalism in Contemporary Northern Europe

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film.

Equivalent - Duplicate Degree Credit Not Granted: SCAN 3301

Additional Information: Arts Sci Core Curr: Ideals and Values

IAFS 3631 (3) Arctic Society and Culture

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

Equivalent - Duplicate Degree Credit Not Granted: SCAN 3631

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IAFS 3640 (3) Data Analysis for Global Environmental Affairs

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3640

Grading Basis: Letter Grade

IAFS 3650 (3) History of Arab-Israeli Conflict

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3650

Requisites: Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

Recommended: Prerequisite HIST 1308 or HIST 1828 or JWST 1828.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

IAFS 4500 (3) The Post-Cold War World

Capstone course for international affairs majors. Examines the ways in which the end of the Cold War, the collapse of failed states, and the rise of global terrorism changed the world. Studies how peoples, governments and nongovernmental organizations face new social, political, economic and security challenges in an era of globalization. Includes discussion, oral reports, critical book reviews, and research papers.

Requisites: Restricted to students with 87-180 credits (Senior)

International Affairs (IAFS) majors only.

IAFS 4800 (3) Honors Seminar in International Affairs

Directed research course tailored to the particular research interests of the students enrolled. Devoted to research methodology and the development of students' research. Department enforced prerequisite: overall 3.30 GPA and IAFS 3.40 GPA.

Additional Information: Arts Sciences Honors Course

IAFS 4810 (3) Honors in International Affairs

Continuation of IAFS 4800. Students complete original research begun in the fall and write, defend their honors thesis and meet regularly with the instructor.

Requisites: Requires prerequisite course of IAFS 4800 (minimum grade C-).

Additional Information: Arts Sciences Honors Course

IAFS 4900 (1-6) Independent Study in International Affairs

Provides an opportunity to earn academic credit for learning outside the formal class structure. Students interested in doing in-depth research propose a research project to a faculty sponsor and then work closely with that person to produce a piece of original research. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors), GPA of 3.00 or better, grade of C or better in all lower-division courses, and at least 6 upper-division courses.

Repeatable: Repeatable for up to 6.00 total credit hours.

IAFS 4930 (3-6) Internship in International Affairs

Working individually under the guidance of a public or private organization, students are assigned to projects selected for their academic suitability. Written assignments occur throughout the semester.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

Arctic Studies - Certificate

The International Affairs Program (IAFS) offers an interdisciplinary undergraduate certificate in arctic studies, in collaboration with the Program in Nordic Studies (SCAN), the Program in Russian Studies (RUSS), the Department of Geography (GEOG), the Department of Environmental Studies (ENVS), the Department of Anthropology (ANTH), the Department of Ethnic Studies (ETHN) and the research entities of the Cooperative Institute for Research in Environmental Sciences (CIRES), the National Snow and Ice Data Center (NSIDC) and the Institute of Arctic and Alpine Research (INSTAAR).

This certificate prepares students to address pressing environmental, political and cultural issues in the far north. A laboratory for studying the effects of global climate change, the arctic region spans three continents, with territories in Canada, Greenland (Denmark), Finland, Iceland, Norway, Sweden, Russia and the United States. Its population exhibits considerable ethnic, linguistic, and sociopolitical diversity, and contains numerous indigenous peoples. Issues as critical as nationalism, territorial rights and law, security, economic development and resource technology place the arctic at the center of global, regional and national interests. Further, the region's natural and social characteristics have inspired influential and enduring expressive culture—produced by locals and outsiders—from antiquity to the present.

These features make study of the arctic ideal for students pursuing careers in international politics and diplomacy, indigenous rights, environmental science and climate change, humanistic scholarship or creative work.

For more information, and to apply to the certificate in arctic studies, please contact Prof. Ben Teitelbaum (<http://www.colorado.edu/iafs/benjamin-teitelbaum>) at benjamin.teitelbaum@colorado.edu ([benjamin.teitelbaum@colorado.edu?subject=RE: Arctic Studies Certificate](mailto:benjamin.teitelbaum@colorado.edu?subject=RE:ArcticStudiesCertificate) (IAFS website)).

Requirements

The certificate is open to all CU undergraduates and requires the completion of six courses for a total of 18 credit hours.

Credit hours are distributed in three categories: (1) Certificate Core Courses, (2) Environment and Policy, and (3) Culture and Society. Students must complete all three courses in the core category and one course in each of the other two categories. They will then take one elective course, and only one 1000-level course is allowed. Nine of the 18 credits must be upper-division.

Up to three credits of approved study abroad experience may be applied to either the Environment and Policy or Culture and Society categories.

Required Courses and Semester Credit Hours

Required Certificate Core Courses

GEOG 2271	Introduction to the Arctic Environment	3
PSCI 3206	The Environment and Public Policy	3
IAFS/SCAN 3631	Arctic Society and Culture	3

Society and Culture

3-6

ETHN 2013	Critical Issues in Native North America	
RUSS 2501	Russia Today	
SCAN 2201	Introduction to Modern Nordic Culture and Society	
SCAN 3206	Nordic Colonialisms	
SCAN 3301	Radical Nationalism in Contemporary Northern Europe	

Environment and Policy

3-6

EBIO 3170	Mountain Ecology and Conservation	
EBIO 3175		
ENVS 1000	Introduction to Environmental Studies	
ENVS 3022	Climate Politics and Policy	
GEOG 4261	Glaciers and Permafrost	
GEOG 4271	The Arctic Climate System	
GEOG 3682	Geography of International Development	
IAFS 1000	Global Issues and International Affairs	
PSCI 2116	Introduction to Environmental Policy and Policy Analysis	

European Union Studies - Certificate

The Certificate in European Union Studies (CEUS) allows CU Boulder undergraduates in a range of social science and humanities programs to gain skills and understanding around the European Union (EU). The certificate documents a student's expertise in European Union Studies, opening opportunities for further study, internships and careers in public, private or nonprofit sectors.

CEUS is housed in the International Affairs Program (IAFS) in the College of Arts and Sciences, and the certificate curriculum is intentionally interdisciplinary. Students admitted into the program will complete coursework with EU content going beyond what they can obtain merely by completing any single major. They will also participate in co-curricular activities to augment their understanding of the development, focus, functioning and future of the EU. Upon completion of this program, students will have a demonstrated understanding of the European Union; its politics, history, institutions, economics, policies, member states, relations with the US, role in the world and much more.

Requirements

Application and Admission

Applications for admission into the certificate program can be submitted to iafs@colorado.edu. The application includes an essay describing the applicant's interests and background in EU studies and reasons or motivations for pursuing this certificate. Please include an unofficial transcript.

All degree-seeking students at CU Boulder are eligible to apply for the certificate once they have completed at least 30 credit hours of coursework and have completed at least six credits hours of coursework from the certificate requirements (below). The certificate would be particularly useful, however, to students majoring in one of the following related social science and humanities majors: International Affairs, Political Science, History, Geography, Sociology, Women and Gender Studies, Economics, French, Italian, Spanish, Russian Studies, or German Studies.

Applications will be reviewed once each semester for admission effective the following term.

Certificate Requirements

A total of 19 credit hours of coursework is required to complete the Certificate in European Union Studies. All credit hours must be completed with grades of C- or better and an overall GPA of 2.00. None of the required hours may be taken pass/fail.

In addition to their course work, CEUS students will attend at least four EU-related lectures and events during their semesters of residency at CU and will submit a brief write-up of the main themes or discussion points of the events to iafs@colorado.edu.

Students earn the certificate in European Union studies upon verification by the Director of International Affairs that they have completed a series of curricular and co-curricular requirements.

Required Courses and Semester Credit Hours

Lower-Division Core Requirements

7

It is essential that all students in the EU Studies Certificate program begin with a common framework for the analysis of international institutions and relations as a background for the upper division coursework in EU studies. All students must therefore complete the following lower division requirements:

PSCI 2012 Introduction to Comparative Politics

IAFS 1000 Global Issues and International Affairs

Upper-Division Core Requirements

3

PSCI 4302 European Union Politics

Upper-Division Electives

9

Students must complete at least 9 hours of relevant upper-division course work, including at least 6 credit hours from outside their major or minor, selected from the list below. Courses not listed here, but with a focus on EU issues may be applied to this elective requirement with permission from the Director of International Affairs. This includes, in particular, courses taken on authorized study abroad program in EU countries.

ECON 4514 Economic History of Europe

FNCE 4060 Special Topics in Finance (certain topics)

GEOG 4892 Geography of Western Europe

GRMN 3150 Issues in German Politics and Literature

GRMN/WGST 4301 Gender, Race and Immigration in Germany and Europe

HIST 4212 The Age of Religious Wars: Reformation Europe, 1500-1648

HIST 4053 Britain and the Empire, 1688-1964

HIST 4083 Revolution and Nationalism in Modern Ireland

HIST 4233 History of France since 1815

HIST 4423 German History Since 1849

HIST 4424 Modern European Thought and Culture, 1870-Present

HIST 4442 Europe since 1945

IAFS 3500 French Connections: Contemporary France and America in Historical Context

ITAL 4250 History of Modern Italy

PSCI 3074 Democracy and Its Citizens in the US and EU

PSCI 3143 Current Affairs in International Relations

PSCI 4002 Western European Politics

PSCI 4062 East European Politics

PSCI 4173 International Cooperation and Global Anarchy

PSCI 4183 International Law

PSCI 4193 International Political Economy

PSCI 4213 Europe and the International System

SPAN 3200 Spanish Culture

SPAN 3240 Catalan Culture 1: Nation and Art

SPAN 3250 Catalan Culture 2: Contemporary Trends and Barcelona

SPAN 3230 Discovering Barcelona: Culture and Heritage

SPAN 3270 Barcelona: Understanding Local and Immigrant Cultures

Total Credit Hours

19

Global Environmental Affairs - Certificate

The Certificate in Global Environmental Affairs is offered jointly by the Program in International Affairs (IAFS) and the Program in Environmental Studies (ENVS). This certificate is open to all majors at CU Boulder, and it draws upon courses and interdisciplinary expertise in both IAFS and ENVS. This certificate links and develops knowledge of global environmental policies and practices. For IAFS and ENVS students, it will provide additional value for the two interdisciplinary majors. For more information and to apply, contact GEAcertificate@colorado.edu.

Why do the GEA?

The certificate in Global Environmental Affairs provides students with opportunities to personalize undergraduate learning across disciplinary lines and to deepen student engagement with world problems. The certificate includes both formal coursework and a 3-credit off-campus experiential component. This experiential learning component may be completed through internship, study abroad, or CU in DC. This requirement not only enriches the students' educational experience through applied learning and fieldwork, but it also helps students demonstrate their skills and experience as they prepare for graduation and the job market.

The certificate requires 19-20 credits (depending on the courses chosen). For more details and application information, see the International Affairs Program (<http://www.colorado.edu/iafs>) website.

Track 1: ENVS Majors

<i>Introductory course</i>		4
IAFS 1000	Global Issues and International Affairs	
<i>9 credits from the following elective list:</i>		9
ENVS 4100	Special Topics in Environmental Studies (approved sections for the certificate)	
ENVS 4800	Capstone: Critical Thinking in Environmental Studies (approved sections for the certificate)	
ECON 3403	International Economics and Policy	
ECON 3784	Economic Development and Policy	
IAFS 3000	Special Topics in International Affairs (approved sections for certificate)	
PSCI 4012	Global Development	
PSCI 4732	Critical Thinking in Development	
<i>Data Analysis requirement</i>		3
ENVS/IAFS 3640	Data Analysis for Global Environmental Affairs	
<i>Off-Campus requirement</i>		3
Approved ENVS 3930 internship, study abroad class, or CU in DC class		
Total Credit Hours		19

Track 2: IAFS majors

<i>Introductory course</i>		4
ENVS 1000	Introduction to Environmental Studies	
<i>9 credits from the following elective list:</i>		9
ENVS 4100	Special Topics in Environmental Studies (approved sections for the certificate)	
ENVS 4800	Capstone: Critical Thinking in Environmental Studies (approved sections for the certificate)	
ENVS 3070	Energy and the Environment	
ENVS/GEOL 3520	Energy and Climate Change: An Interdisciplinary Approach	
ENVS 3525	Intermediate Environmental Problem Analysis: Topical Cornerstones	
ENVS 3621	Energy Policy and Society	
<i>Data Analysis requirement</i>		3
ENVS/IAFS 3640	Data Analysis for Global Environmental Affairs	
<i>Off-campus requirement</i>		3
Approved IAFS 4930 internship, study abroad class, or CU in DC class		
Total Credit Hours		19

Track 3: All other majors (20 credits)

<i>Introductory courses - complete BOTH</i>		8
IAFS 1000	Global Issues and International Affairs	
ENVS 1000	Introduction to Environmental Studies	
<i>6 credits from the elective list of Track 1 or Track 2</i>		6
<i>Data Analysis requirement</i>		3

ENVS/IAFS 3640 Data Analysis for Global Environmental Affairs

<i>Off-campus requirement</i>	3
ENVS 3930 or other internship class, study abroad class, or CU in DC class	
Total Credit Hours	20

International Affairs - Bachelor of Arts (BA)

With the increasing importance of world issues to the United States, employment opportunities in government, international organizations and business continue to expand. Today there is an urgent need for college graduates with a strong background in international affairs. To meet this need, the University of Colorado offers a comprehensive and flexible interdisciplinary program in international affairs leading to the BA degree.

The undergraduate degree in international affairs emphasizes knowledge and awareness of:

- major political, economic, social and cultural problems facing the international community, including international economic relations, world population and resource utilization
- the international political system in the broadest global context, international organizations and alliances, and foreign political systems and processes
- ethical issues involved in international relations
- patterns of conflict and cooperation among nations and peoples
- chief historical factors that give rise to existing international institutions and processes
- problems and issues in United States foreign policy

In addition, students completing the degree in international affairs are expected to acquire the ability and skills to:

- analyze an international problem from a political, economic, historical and cultural perspective
- read, critically evaluate and synthesize information obtained from international affairs literature
- analyze international phenomena critically
- communicate, orally and in writing, findings to other students of international affairs and to a broader audience
- communicate in other cultural contexts through advanced foreign language study

Requirements

Students must complete the general requirements of the College of Arts and Sciences and a minimum of 51 credit hours of specified courses with a grade of C- or better (none may be taken pass/fail).

Required Courses and Semester Credit Hours

Lower-Division

ECON 2010	Principles of Microeconomics	4
ECON 2020	Principles of Macroeconomics	4
IAFS 1000	Global Issues and International Affairs	4
PSCI 2012	Introduction to Comparative Politics	3

PSCI 2223	Introduction to International Relations	3
Total Credit Hours		18

Upper-Division

Complete the requirements listed below for **functional area, geographic concentration, off-campus experience, foreign language** and **senior seminar**. IAFS 3000 Special Topics in International Affairs can be repeated up to 9 credit hours for different topics.

Functional Area (18 credit hours)

Students must complete one class in each of the four functional areas and complete two additional classes in any functional area. Students cannot apply more than four functional area classes from any one department.

Development and Culture (Functional Area I)

ANTH 4020	Explorations in Anthropology (approved topics only)	3-6
ANTH 4500	Cross-Cultural Aspects of Socioeconomic Development	3
COMM 3410	Intercultural Communication	3
ECON 3784	Economic Development and Policy	3
ECON/GEOG 4292	Migration, Immigrant Adaptation, and Development	3
ECON 4774	Economic Reform in Developing Countries	3
ECON 4784	Economic Development	3
ECON 4794	Economic Growth	3
GEOG/WGST 3672	Gender and the Global Economy	3
GEOG 3682	Geography of International Development	3
GEOG 3692	Introduction to Global Public Health	3
GEOG 4632	Development Geography	3
GEOG 4852	Health and Medical Geography	3
IAFS/JWST 3600	Contemporary Jewish Societies	3
IAFS/SCAN 3631	Arctic Society and Culture	3
IAFS/ENVS 3640	Data Analysis for Global Environmental Affairs	3
LING 3545	World Language Policies	3
MDST 3201	Media, Culture and Globalization (International Media Certificate students only)	3
PSCI 4012	Global Development	3
PSCI 4732	Critical Thinking in Development	3
SOCY 3002	Population and Society	3
SOCY/WGST 3012	Women and Development	3
SOCY 4007	Global Human Ecology	3
SOCY 4052	Social Inequalities in Health	3
WGST 3500	Global Gender Issues	3
WGST 4300	Sex, Power, Politics: International Perspectives	3
International Economics, Business, Political Economy (Functional Area II)		
ECON 3403	International Economics and Policy	3
ECON 3545	Environmental Economics	3
ECON 4413	International Trade	3
ECON 4423	International Finance	3
ECON 4504	The New Institutional Economics: Institutions, Contracts and Economic Outcomes	3

ECON 4545	Environmental Economics	3
FNCE 4060	Special Topics in Finance	1-6
INBU 3300	International Business and Management	3
INBU 3450	International Marketing	3
INBU 4200	International Financial Management	3
PSCI 4193	International Political Economy	3
Political Geography, International Security, Foreign Policy (Functional Area III)		
ANTH/JWST 4580	The Holocaust: An Anthropological Perspective	3
GEOG 3742	Place, Power, and Contemporary Culture	3
GEOG 4712	Political Geography	3
GEOG 4742	Topics in Environment and Society (approved topics only)	3
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	3
HIST 4050	A Global History of World War II	3
HIST 4126	History of U.S. Foreign Relations Since 1941	3
HIST 4146	U.S. Military History since 1898	3
HIST 4166	The Vietnam War in Politics and Culture	3
IAFS 3500/ HIST 4190	French Connections: Contemporary France and America in Historical Context (Global Seminar)	3
IAFS/JWST 3650	History of Arab-Israeli Conflict	3
PHIL 3190	War and Morality	3-4
PSCI 3123	War, Peace, and Strategic Defense	3
PSCI 3143	Current Affairs in International Relations	3
PSCI 3163	American Foreign Policy	3
PSCI 3193	International Behavior	3
International Institutions, Rights and Norms (Functional Area IV)		
HIST 4820	Human Rights: Historical Perspectives	3
IAFS 3630/ SCAN 3301	Radical Nationalism in Contemporary Northern Europe	3
INVS 4402	Nonviolent Social Movements	3
JRNL 4411	International Media and Global Crises (International Media Certificate students only)	3
PHIL 3260	Philosophy and the International Order	3
PRLC 3810	Global Issues in Leadership	3
PSCI 3062	Revolution and Political Violence	3
PSCI 4173	International Cooperation and Global Anarchy	3
PSCI 4183	International Law	3
PSCI 4252	Politics of Ethnicity and Nationalism	3
PSCI 4783	Global Issues	3
SOCY/ENVS 4027	Inequality, Democracy, and the Environment	3
SOCY 4121	Sociology of Religion	3
WGST 3220	Women in Islam	3
WGST 3710	Topics in Global Gender and Sexuality Studies	3
WGST 4000	Advanced Topics in Gender and Sexuality Studies	3
WGST 4010/ SOCY 4000	Gender, Genocide and Mass Trauma	3
WGST 4500/ PSCI 4391	Gender Politics and Global Activism	3

Geographic Concentration (9 credit hours)

Students are required to complete three classes concentrating on one of the four following global regions: Africa/Middle East, Asia, Europe/Eurasia or Latin America. Students should choose a geographic concentration and a language appropriate to that geographic concentration no later than the beginning of their junior year.

Geographic concentration coursework should be mainly in the social sciences, must include one course in contemporary history and can include a maximum of three credit hours of regional literature and arts (taught in the foreign language whenever possible). See the International Affairs Program (<http://www.colorado.edu/iafs>) website for geographic concentration courses.

Off-Campus Experience (3 credit hours)

Complete 3 upper-division credit hours to fulfill the Off-Campus Experience from one of: IAFS 4930 Internship in International Affairs; a CU Boulder study abroad course; a CU in DC course; or other credit-bearing off-campus experience approved by the program.

Language Requirement

A third-year university-level proficiency in a foreign language appropriate to the geographic concentration is required. This requirement may be met by completion of one or two semester-long, third year, university-level grammar courses (depending on the language) with a grade of C- or better, while also satisfying language department requirements for advancement through the sequence. See the International Affairs Program (<http://www.colorado.edu/iafs>) website for more information.

Senior Seminar

IAFS 4500	The Post-Cold War World	3
or IAFS 4800	Honors Seminar in International Affairs	
<hr/>		
Total Credit Hours		3

Recommendations

- All international affairs majors should have a good command of the English language.
- Students should choose electives with a view to their relevance to this program or usefulness as prerequisites for upper-division work.
- Students in international affairs are encouraged to consider the possibility of participating in one of the Study Abroad programs affiliated with the University of Colorado. Students wishing to participate in such a program should contact their advisor to work out an appropriate program.
- Internships are a useful experience for students seeking a career in international affairs. The Internship in International Affairs (IAFS 4930) provides the opportunity to earn academic credit for appropriate internships in the field. This course is generally offered during the spring and fall semesters and during summer sessions. Interested sophomores, juniors or seniors should consult with the director of the Internship Program. An application is required for admission to the Internship Program; see the International Affairs Program (<http://www.colorado.edu/iafs>) website for more details. IAFS 4930 could count for the Off-Campus Experience, major elective, or geographic concentration credit with approval from the internship director.
- The IAFS Honors Program offers the opportunity to learn and apply research skills for a select number of IAFS majors. Entry into the IAFS Honors Program is limited to seniors with a 3.40 major GPA and a 3.30 overall GPA. The Honors Seminar in International Affairs (IAFS 4800—offered each fall semester) provides instruction in

research methods and facilitates the development of a sound research project. Research continues into the spring semester under the guidance of individual faculty members and through the continuation course, Honors in International Affairs (IAFS 4810). Interested and eligible students should consult with their academic advisor and the director of the Honors Program before spring break of their junior year. An application is required for admission to the Honors Program; see the International Affairs Program (<http://www.colorado.edu/iafs>) website for more details. IAFS 4810 could count for either an upper-division functional area and/or a geographic concentration class with approval from the honors director.

- Students interested in international affairs may want to consider the Global Studies Residential Academic Program offered through the residence halls. See Residential Academic Programs for information.
- International affairs majors who wish to minor in political science must apply the following additional rules:
 - No more than 9 credit hours toward the PSCI minor can come from courses that count toward another major
 - International affairs majors must take at least one upper-division course in American politics and one course (lower- or upper-division) in political theory, in addition to the regular minor requirements.

The specific courses that may be counted to meet the requirements in this program are determined by the committee on international affairs and the dean of the College of Arts and Sciences.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in international affairs, students should meet the following requirements:

- Declare the major by the beginning of the second semester
- Begin language study by the third semester
- Complete the lower-division requirements by the end of the sophomore year
- Begin geographic concentration courses in first semester of the junior year
- Begin upper-division general international affairs requirements in the first semester of the junior year
- Successfully complete any remaining major requirements by the end of the eighth semester

International Media - Certificate

This undergraduate certificate program is designed exclusively for undergraduate students enrolled in the College of Media, Communication and Information (CMCI), and in the International Affairs program (IAFS) in the College of Arts and Sciences. This certificate allows students majoring in international affairs to explore careers in international reporting, advertising and entertainment, while CMCI majors will acquire the context and perspective necessary to work in global and international jobs.

Requirements

The certificate requires 18 to 19 credit hours (depending on the lower-division courses chosen), 15 of which must be upper-division courses.

Students majoring in international affairs are eligible to apply for admission to the certificate program if they have completed 30 credit hours (at least 6 of which must be in their major) with a GPA of 2.75 or better.

For more information, visit the International Affairs Program (<http://www.colorado.edu/iafs>) website.

Required Courses

CMCI Students

Required Courses

MDST 3201	Media, Culture and Globalization	3
JRNL 4411	International Media and Global Crises	3
Choose one of the following:		3-4
IAFS 1000	Global Issues and International Affairs	
PSCI 2012	Introduction to Comparative Politics	
PSCI 2223	Introduction to International Relations	
GEOG 1962	Geographies of Global Change	

Electives

Choose at least 9 credit hours of courses from List A.	9
Total Credit Hours	18-19

International Affairs Majors

Required Courses

MDST 3201	Media, Culture and Globalization	3
JRNL 4411	International Media and Global Crises	3

Electives

Choose a total of 12 credit hours of courses from Lists A and B. ¹	12
Total Credit Hours	18

¹ International affairs majors must take at least 6 credit hours from List B.

Electives

List A

Courses on this list deal with international issues.

GEOG 3682	Geography of International Development	3
GEOG 4712	Political Geography	3
HIST 4126	History of U.S. Foreign Relations Since 1941	3
HIST 4820	Human Rights: Historical Perspectives	3
ECON 3403	International Economics and Policy	3
ECON 3545	Environmental Economics	3
ECON 3784	Economic Development and Policy	3
ECON 4784	Economic Development	3
PHIL 3190	War and Morality	3-4
PHIL 3260	Philosophy and the International Order	3
PSCI 3143	Current Affairs in International Relations	3
PSCI 3163	American Foreign Policy	3
PSCI 3193	International Behavior	3
PSCI 4012	Global Development	3
PSCI 4173	International Cooperation and Global Anarchy	3

PSCI 4183	International Law	3
PSCI 4193	International Political Economy	3
PSCI 4732	Critical Thinking in Development	3
PSCI 4783	Global Issues	3
WGST 3500	Global Gender Issues	3

List B

Courses on this list deal with communication media.

JRNL 2001	Fundamentals of Reporting	3
JRNL 3102	Photojournalism I	3
JRNL 3651	Media Law and Ethics	3
JRNL 4351	Reporting Wars, Conflict and Peace	3
MDST 3321	Media Industries and Economics	3
MDST 3711	Media and Popular Culture	3
MDST 3791	Media and the Public	3
MDST 4211	Asian Media and Culture	3
MDST 4371	Media and Religion	3
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	3

Jewish Studies

The Program in Jewish Studies, which is open to all students of all backgrounds, Jewish and non-Jewish, explores Jewish culture, history, society, and thought from a broad, interdisciplinary perspective. The program reflects the core goals of Colorado's flagship university: to provide an outstanding liberal arts education, to foster critical thought, and to instill a keen appreciation of humankind's interrelatedness and diversity. At its core, the major trains students to be global citizens by studying one of the world's oldest global peoples.

With internationally acclaimed faculty engaged in cutting-edge research and opportunities to study with leading artists, scholars, and professionals working in the field of Jewish Studies, the program offers an innovative and contemporary curriculum designed to provide a strong foundation in cultural education and to connect Jewish thought and text to action and people's lives.

The Program offers a Bachelor of Arts in Jewish Studies (students can pursue either a culture intensive concentration or a foreign language intensive concentration), a Minor in Jewish Studies, and a Minor in Hebrew and Israel Studies.

An undergraduate degree in Jewish Studies emphasizes knowledge and awareness of:

- the history of global Jewish communities over time, including the history of Israel and Palestine, biblical and medieval Jewish history, history of Jewish communities in the Mediterranean, the history of the Holocaust, and post-Holocaust American Judaism
- dimensions of Jewish culture across variant Jewish communities, including differences in Jewish cultural practices, Jewish music and film, and Jewish philosophies, religious practices, mysticisms, and thought
- Jewish literature from the biblical period to the present, including Israeli literature, the Hebrew origins of western civilization, and contemporary Jewish literature, and

- global languages of the Jewish people, including Hebrew, Arabic, Spanish, French, Italian, Russian, German, Ladino, and others (for students pursuing the foreign language intensive concentration).

In addition, students completing the degree in Jewish Studies are expected to develop:

- fundamental skills in critical thinking, comparative analysis, oral and written expression
- a well-rounded perspective of the diversity of the Jewish experience, and
- professional skills intended to aid students in their career ambitions.

Jewish Studies alumni have gone onto careers in politics, international policy, criminal justice, non-profit, business, education, law, public relations, administration, marketing, real estate, and journalism. Many have pursued additional education through graduate programs and professional schools.

The study of Jewish culture, society, history, and religion is, by its nature, comparative and interdisciplinary. Our program offers many cross-listed classes with other departments on campus to facilitate a well-rounded learning experience. Many of our courses also satisfy core requirements.

The program also offers many professional development opportunities to help students find employment after graduation in a field that fits their interests. The Internship in Jewish Studies (JWST 3930) pairs students with local organizations based on the student's long-term career goals. Majors are also required to complete a Capstone in Jewish Studies (JWST 4000) in which they design an artistic project or research paper under the supervision of a faculty mentor that serves as a summation of their work in Jewish Studies. Majors and minors are eligible to join the Jewish Studies Undergraduate Student Advisory Board. Jewish Studies also highly encourages students to study abroad and has instituted two Global Seminars, one to Istanbul and the other to Israel.

The Program in Jewish Studies is growing rapidly and new courses are continually being added. Visit www.colorado.edu/jewishstudies (<https://www.colorado.edu/jewishstudies>) for the most current course information.

Course codes for this program are JWST and HEBR.

Bachelor's Degree

- Jewish Studies - Bachelor of Arts (BA) (p. 409)

Minors

- Hebrew and Israel Studies - Minor (p. 409)
- Jewish Studies - Minor (p. 412)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Goodman, Nan (https://experts.colorado.edu/display/fisid_100633)
PhD, Harvard University

Goodman, Zilla Jane (https://experts.colorado.edu/display/fisid_134687)
Senior Instructor; PhD, Univ of Cape Town (South Africa)

Halperin, Liora R (https://experts.colorado.edu/display/fisid_152972)
PhD, University of California-Los Angeles

Malin, Jonathan (https://experts.colorado.edu/display/fisid_151714)
Associate Professor; PhD, University of Chicago

Rivlin, Eyal Ofer (https://experts.colorado.edu/display/fisid_151100)
Instructor; MA, Naropa Institute

Sacks, Elias R. (https://experts.colorado.edu/display/fisid_151425)
PhD, Princeton University

Shneer, David (https://experts.colorado.edu/display/fisid_146105)
Professor; PhD, University of California-Berkeley

JWST 1040 (3) Beginning Biblical Hebrew, Second Semester

Building on HEBR 1030, continues to build expertise in reading the Hebrew Bible. Modern language acquisition and classical grammar study methods equip students with the tools to translate and read the various genres of the Biblical material. Department enforced prerequisite: HEBR 1030 or JWST 1030 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: HEBR 1040

JWST 1234 (3) Mysticism and the Jewish American Literary Tradition

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 1340

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

JWST 1818 (3) Introduction to Jewish History: Bible to 1492

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1818 and RLST 1818

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

JWST 1828 (3) Introduction to Jewish History: Since 1492

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1828 and RLST 1828

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context

JWST 1830 (3) Global History of Holocaust and Genocide

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1830 and RLST 1830

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

JWST 1900 (3) Introduction to the Hebrew Bible/Old Testament

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

Equivalent - Duplicate Degree Credit Not Granted: RLST 1900

Grading Basis: Letter Grade

JWST 1910 (3) Introduction to the New Testament

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

Equivalent - Duplicate Degree Credit Not Granted: RLST 1910

Grading Basis: Letter Grade

JWST 2350 (3) Introduction to Jewish Culture

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

Equivalent - Duplicate Degree Credit Not Granted: GSLL 2350

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 2502 (3) Representing the Holocaust

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake?

Equivalent - Duplicate Degree Credit Not Granted: JWST 2502

Additional Information: Arts Sci Core Curr: Ideals and Values

JWST 2551 (3) Modern Jewish Literature

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly GSLL 2551.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Hebrew

JWST 2600 (3) Judaism, Christianity, and Islam

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2600

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Asia Content

JWST 3100 (3) Judaism

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3100

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

JWST 3110 (3) Of Jewish Legends, Folktales and the Supernatural

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3110

JWST 3120 (3) Radical Jews

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3120

Grading Basis: Letter Grade

JWST 3200 (3) Religion and Feminist Thought

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3200

JWST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 3202 and RLST 3202 and WGST 3201

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 3310 (3) The Bible as Literature

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly JWST 3312.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3310 and HUMN 3310

Additional Information: Arts Sci Core Curr: Ideals and Values

JWST 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the Cold War.

Equivalent - Duplicate Degree Credit Not Granted: GSSL 3401

JWST 3501 (3) German-Jewish Writers: From the Enlightenment to the Present

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3501

Additional Information: Arts Sci Core Curr. Human Diversity

JWST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3530 and RLST 3530

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Human Diversity

JWST 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3600 and GSSL 3600

Additional Information: Arts Sci Core Curr. Human Diversity

JWST 3610 (3) Topics in International Affairs and Jewish Studies

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3610

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 3650 (3) History of Arab-Israeli Conflict

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3650

Additional Information: Arts Sci Core Curr. Historical Context
Departmental Category: Asia Content

JWST 3930 (3) Internship in Jewish Studies

Learn beyond the classroom by interning in a local non-profit organization that connects with the Program in Jewish Studies through its mission and/or program. Interns will attend class to learn about work place ethics, professional development and leadership skills through a Jewish Studies lens. Interns will be supervised by the faculty member of record as well as the employer housing the intern.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites HEBR 2350 or JWST 2350 or HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828.

JWST 4000 (1-3) Capstone in Jewish Studies

Serves as the final product for students completing the major in Jewish Studies. Students will design a project under the supervision of a mentor that serves as the summation of their past work in Jewish Studies. Capstone projects can take the form of a thesis, film or another media. Instructor consent required for JWST minors.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Jewish Studies (JWST) BA majors only. Excludes JWST minors.

JWST 4050 (3) Anthropology of Jews and Judaism

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4050

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 4101 (3) Topics in Hebrew Studies

Explores topics in Hebrew and Jewish literature and cultures. These may include topics such as diasporic literatures, Jewish artists and thinkers, courses on specific authors, figures or communities. Topics change each semester. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 4101

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 4122 (3) Music in Jewish Culture

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4122

Grading Basis: Letter Grade

JWST 4170 (3) God and Politics

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4170 and RLST 5170

JWST 4180 (3) Is God Dead?

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4180 and RLST 5180

JWST 4203 (3) Israeli Literature: Exile, Nation, Home

Examines the creation and development of Israeli literature from its pre-State beginnings to the present day, from the writings of immigrants for whom Hebrew was not their mother tongue to a literature written by native Hebrew speakers. Considers texts written by Israeli Jewish and Arab writers and explores how ideas of exile, nation, and home play into the Israeli experience.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 4203

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ENGL 4677 or JWST 4677 or GRMN 2502 or JWST 2502 or JWST 2551 or WRTG 3020.

Additional Information: Arts Sci Core Curr: Literature and the Arts

JWST 4260 (3) Topics in Judaism

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4260 and RLST 5260

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 4301 (3) Venice: The Cradle of European Jewish Culture

Explores the development of European Jewish culture from the late Middle Ages to the present by focusing on Jewish life in the city of Venice, Italy. Emphasis is on the development of Venetian print culture and emergence of Italy as a center of Jewish publishing in both the religious and secular world. Examines a variety of cultural and historical material including early printings of the Talmud, the creation of Yiddish popular literature, Hebrew rabbinic literature, responses to political turmoil, and the aftermath of the Nazi genocide. Taught in English. Department enforced prerequisite: HEBR 2350 or JWST 2350 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: HEBR 4301

Additional Information: Arts Sci Core Curr: Literature and the Arts

JWST 4302 (6) Global Seminar: Justice, Human Rights and Democracy in Israel

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3520

Recommended: Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Asia Content

JWST 4338 (3) History of Modern Israel/Palestine

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4338

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

JWST 4348 (3) Topics in Jewish History

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4348

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of HIST 1308 or HIST 1828 or JWST 2350 (minimum grade D-).

JWST 4378 (3) History of Modern Jewish-Muslim Relations

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4378

Additional Information: Departmental Category: Asia Content

JWST 4401 (3) The Russian Jewish Experience

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4401 and RUSS 5401

Recommended: Prerequisite any 1000 or 2000-level undergraduate literature course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

JWST 4454 (3) Jewish Intellectual History

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4454

Additional Information: Departmental Category: Europe: Topical

JWST 4534 (3) Modern European Jewish History

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4534

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

Grading Basis: Letter Grade

JWST 4544 (3) History of Yiddish Culture

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4544 and HIST 5544

Recommended: Prerequisite HIST 1818 or JWST 1818 or JWST 1828 or GSSL 2350 or JWST 2350.

JWST 4580 (3) The Holocaust: An Anthropological Perspective

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4580

JWST 4677 (3) Jewish-American Literature

Explores the Jewish-American experience from the 19th century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly JWST 3677.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4677

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 4827 (3) Modern U.S. Jewish History since 1880

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4827

Additional Information: Departmental Category: United States: Topical Courses 2

JWST 4900 (1-6) Independent Study in Jewish Studies

Working with a faculty member in Jewish Studies on an independent study research project provides students with an opportunity to learn outside the formal classroom structure, with individual direction from Jewish Studies faculty on a topic of mutual interest not offered in regularly scheduled classes. (Independent study may not be used to substitute for a regular course not being offered in a given term.)

Repeatable: Repeatable for up to 6.00 total credit hours.

Hebrew and Israel Studies - Minor

The Minor in Hebrew and Israel Studies focuses on developing a student's Hebrew language skills while exploring a variety of courses on issues related to Israel and the Middle East. This minor is ideal for students who are interested in pursuing an international career or study in the Middle East.

The Minor in Hebrew & Israel Studies is open to all students of all backgrounds, Jewish and non-Jewish.

A minor is offered in Hebrew and Israel Studies. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students must complete 19 credit hours of Hebrew language and course requirements. A grade of C- or better must be received in all courses used to satisfy the minor requirements. For more information, visit the Minor in Hebrew and Israel Studies (<http://www.colorado.edu/>

jewishstudies/academics/majors-minors-jewish-studies/minor-hebrew-israel-studies) website.

Required Courses and Semester Credit Hours

Language Requirement

Modern Hebrew Language (10 credit hours minimum above the 2010 Intermediate Hebrew level):	10
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HEBR 2120	Intermediate Modern Hebrew, Second Semester	
HEBR 3010	Third Year Modern Hebrew, First Semester	
HEBR 3020	Third Year Modern Hebrew, Second Semester	

Required Course:		3
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JWST/GSSL 2350	Introduction to Jewish Culture	
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Additional Requirements:

Select two of the following (or course approved by advisor) Hebrew/ Israel Studies courses (6 credit hours):	6
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HEBR 1030	Beginning Biblical Hebrew, First Semester	
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HEBR 1040	Beginning Biblical Hebrew, Second Semester	
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JWST/IAFS 3650	History of Arab-Israeli Conflict	
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JWST/ANTH 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)	
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JWST/HEBR 4101	Topics in Hebrew Studies	
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JWST 4203	Israeli Literature: Exile, Nation, Home	
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JWST 4302/IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel	
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JWST/HIST 4338	History of Modern Israel/Palestine	
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JWST/HIST 4348	Topics in Jewish History (Tel Aviv: Urban History and Culture)	
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Total Credit Hours		19
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Jewish Studies - Bachelor of Arts (BA)

The Major in Jewish Studies is designed to help students develop the professional skills they need to become engaged global citizens, preparing them to obtain a job after graduation or pursue graduate studies. By studying the world through the lens of Jewish culture, history, literature, society, and thought from a broad, interdisciplinary perspective, our students gain fundamental critical thinking, problem solving, and communication skills.

Students pursuing a BA in Jewish Studies may choose one of the following two concentrations:

- Culture Intensive Concentration, in which students will pursue an in-depth study of Jewish culture.
- Foreign Language Intensive Concentration, in which students will obtain advanced language skills in addition to considerable knowledge of Jewish culture.

The Major in Jewish Studies is open to all students of all backgrounds, Jewish and non-Jewish.

Requirements

In addition to the general requirements of the College of Arts and Sciences, students must complete 36 credit hours of Jewish Studies requirements, of which 18 credit hours must be upper-division (3000- or 4000-level) courses.

A grade of C- or better must be received in all courses used to satisfy the major requirements, with an overall average of 2.00 in the major.

No more than 6 credit hours may be taken in independent study. No *pass/fail* graded courses may satisfy the 36-credit-hour minimum requirement.

Many courses also satisfy university core curriculum requirements. For more information on the core curriculum, visit colorado.edu/artssciences/students/undergraduates/core_curriculum.html (http://colorado.edu/artssciences/students/undergraduates/core_curriculum.html).

Students pursuing a BA in Jewish Studies may choose one of the following two concentrations: Culture Intensive Concentration or Foreign Language Intensive Concentration (see requirements below):

Culture Intensive Concentration: Required Courses and Credit Hours

Required Courses 6

JWST/GSLL 2350 Introduction to Jewish Culture

JWST 4000 Capstone in Jewish Studies (Senior Capstone)

Fundamental Jewish Studies Requirements

Select at least two of the following courses, all courses are highly recommended: 6

JWST/HIST 1818 Introduction to Jewish History: Bible to 1492

JWST/HIST 1828 Introduction to Jewish History: Since 1492

JWST/GSLL 2551 Modern Jewish Literature

JWST/RLST 3100 Judaism

JWST/IAFS 3600 Contemporary Jewish Societies

Literature, Culture, and the Arts ¹

Select at least two of the following courses 6

JWST/GSLL 2551 Modern Jewish Literature

JWST/ENGL 3310 The Bible as Literature

JWST/GSLL 3401 The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe

JWST/GRMN 3501 German-Jewish Writers: From the Enlightenment to the Present

JWST 4101 Topics in Hebrew Studies

JWST/MUSC 4122 Music in Jewish Culture

JWST 4203 Israeli Literature: Exile, Nation, Home

JWST/RUSS 4401 The Russian Jewish Experience

JWST/HIST 4544 History of Yiddish Culture

JWST/ENGL 4677 Jewish-American Literature

JWST 4900 Independent Study in Jewish Studies (On topic relevant to Literature, Culture, and the Arts)

HUMN/GRMN 2601 Kafka and the Kafkaesque ⁴

History, Politics, and Religion

Select at least two of the following courses 6

FYSM 1000 First Year Seminar (God) ⁴

JWST 1234 Mysticism and the Jewish American Literary Tradition

JWST/HIST 1818 Introduction to Jewish History: Bible to 1492

JWST/HIST 1828 Introduction to Jewish History: Since 1492

JWST/HIST/RLST 1830 Global History of Holocaust and Genocide

JWST/RLST 1900 Introduction to the Hebrew Bible/Old Testament

JWST/RLST 1910 Introduction to the New Testament

JWST/GRMN 2502 Representing the Holocaust

JWST/RLST 2600 Judaism, Christianity, and Islam

JWST/RLST 3100 Judaism

JWST/WGST 3200 Religion and Feminist Thought

JWST/RLST 3202/ WGST 3201 Women, Gender & Sexuality in Jewish Texts & Traditions

JWST/IAFS/RLST 3530 Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

JWST/IAFS/GSLL 3600 Contemporary Jewish Societies

JWST/IAFS 3610 Topics in International Affairs and Jewish Studies

JWST/IAFS 3650 History of Arab-Israeli Conflict

JWST 3930 Internship in Jewish Studies

JWST/ANTH 4050 Anthropology of Jews and Judaism

JWST/RLST 4170 God and Politics

JWST/RLST 4180 Is God Dead?

JWST/RLST 4260 Topics in Judaism

JWST 4301 Venice: The Cradle of European Jewish Culture

JWST 4302/ IAFS 3520 Global Seminar: Justice, Human Rights and Democracy in Israel

JWST/HIST 4338 History of Modern Israel/Palestine

JWST/HIST 4348	Topics in Jewish History	
JWST/HIST 4378	History of Modern Jewish-Muslim Relations	
JWST/HIST 4454	Jewish Intellectual History	
JWST/HIST 4534	Modern European Jewish History	
JWST/ANTH 4580	The Holocaust: An Anthropological Perspective	
JWST/HIST 4827	Modern U.S. Jewish History since 1880	
JWST 4900	Independent Study in Jewish Studies (On topic relevant to History, Religion, and Politics)	
WRTG 3020	Topics in Writing (After the Holocaust) ⁴	
Electives (12 credit hours from the courses listed above not used to fulfill a requirement listed above)³		12
<i>Auxiliary Courses (Optional) (maximum of 6 credit hours)</i>		
Auxiliary courses are courses from outside the Program in Jewish Studies which may count toward a Jewish Studies major. For all auxiliary courses, all final projects must be approved for the Jewish Studies major by the Director of Undergraduate Studies for the Program in Jewish Studies. A current list of auxiliary courses eligible to be counted towards the Jewish Studies major can be found on the Program in Jewish Studies website.		
Total Credit Hours		36

Foreign Language Intensive Concentration: Required Courses and Credit Hours

Required Courses		6
JWST/GSLL 2350	Introduction to Jewish Culture	
JWST 4000	Capstone in Jewish Studies (Senior Capstone)	

Language Requirement
 Three years of university level language training or demonstrated equivalent proficiency in Hebrew (modern or Biblical) or another language that is to be used in the Jewish Studies capstone project (JWST 4000). Examples include Russian, French, German, Arabic or Spanish. Language must be approved by major advisor. 0-12

Fundamental Jewish Studies Requirements
 Select at least two of the following courses, all courses are highly recommended: 6

JWST/HIST 1818	Introduction to Jewish History: Bible to 1492	
JWST/HIST 1828	Introduction to Jewish History: Since 1492	
JWST/GSLL 2551	Modern Jewish Literature	
JWST/RLST 3100	Judaism	
JWST/IAFS 3600	Contemporary Jewish Societies	

Optional but highly recommended:

JWST 3930	Internship in Jewish Studies	
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Additional Requirements

12–24 remaining credit hours, of which at least eight must be upper12-24 division (3000-4000 level), taken from among the following list or other courses by approval of major advisor:

*Lower Division:*²

FYSM 1000	First Year Seminar (God) ⁴	
JWST 1234	Mysticism and the Jewish American Literary Tradition	
JWST/HIST/RLST 1830	Global History of Holocaust and Genocide	
JWST/RLST 1900	Introduction to the Hebrew Bible/Old Testament	
JWST/RLST 1910	Introduction to the New Testament	
JWST/GRMN 2502	Representing the Holocaust	
JWST/RLST 2600	Judaism, Christianity, and Islam	
HEBR 1030	Beginning Biblical Hebrew, First Semester	
HEBR 1040	Beginning Biblical Hebrew, Second Semester	
HEBR 2040	Intermediate Biblical Hebrew, Second Semester	
HEBR 2120	Intermediate Modern Hebrew, Second Semester	
HUMN/GRMN 2601	Kafka and the Kafkaesque ⁴	

Upper Division:

JWST/WGST 3200	Religion and Feminist Thought	
JWST/RLST 3202/WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions	
JWST/ENGL 3310	The Bible as Literature	
JWST 3401	The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe	
JWST/GRMN 3501	German-Jewish Writers: From the Enlightenment to the Present	
JWST/IAFS/RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul	
JWST/IAFS 3610	Topics in International Affairs and Jewish Studies	
JWST/IAFS 3650	History of Arab-Israeli Conflict	
JWST/ANTH 4050	Anthropology of Jews and Judaism	
JWST/HEBR 4101	Topics in Hebrew Studies	
JWST/MUSC 4122	Music in Jewish Culture	
JWST/RLST 4170	God and Politics	
JWST/RLST 4180	Is God Dead?	
JWST 4203	Israeli Literature: Exile, Nation, Home	
JWST/RLST 4260	Topics in Judaism	
JWST 4301	Venice: The Cradle of European Jewish Culture	

JWST 4302/ IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
JWST/HIST 4338	History of Modern Israel/Palestine
JWST/HIST 4348	Topics in Jewish History
JWST/HIST 4378	History of Modern Jewish-Muslim Relations
JWST/RUSS 4401	The Russian Jewish Experience
JWST/HIST 4454	Jewish Intellectual History
JWST 4534	Modern European Jewish History
JWST/HIST 4544	History of Yiddish Culture
JWST/ANTH 4580	The Holocaust: An Anthropological Perspective
JWST/ENGL 4677	Jewish-American Literature
JWST/HIST 4827	Modern U.S. Jewish History since 1880
JWST 4900	Independent Study in Jewish Studies
HEBR 3010	Third Year Modern Hebrew, First Semester
HEBR 3020	Third Year Modern Hebrew, Second Semester
HEBR 3030	Advanced Biblical Hebrew, Third Year, First Semester
WRWG 3020	Topics in Writing (After the Holocaust) ⁴

Auxiliary Courses (Optional) (maximum of 6 credit hours)

Auxiliary courses are courses from outside the Program in Jewish Studies which may count toward a Jewish Studies major. For all auxiliary courses, all final projects must be approved for the Jewish Studies major by the Director of Undergraduate Studies for the Program in Jewish Studies. A current list of auxiliary courses eligible to be counted towards the Jewish Studies major can be found on the Program in Jewish Studies website.

Total Credit Hours 36

¹ NOTE: For students pursuing the Culture Intensive Concentration, language courses may count as electives, but they do not count for Literature, Culture, and the Arts.

² NOTE: For student pursuing the Language Intensive Concentration, the first three semesters of modern Hebrew (or any equivalent language being used in the required capstone course JWST 4000) do not count as credit hours toward the major.

³ NOTE: Electives can come from JWST, HEBR, or a range of other departments.

⁴ NOTE: Not subject to the 6 credit hours limit on Auxiliary courses from outside Jewish Studies.

Graduating in Four Years with a BA in Jewish Studies

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. Please speak with your advisor for specific recommendations; the following is intended to be a general outline only

and there may be flexibility to this plan. To maintain adequate progress in Jewish Studies, students should meet the following requirements:

- Declare the major by the beginning of the second semester, freshmen year.
- Chose to pursue either the Culture Intensive Concentration or the Foreign Language Intensive Concentration.
- For students pursuing the foreign language intensive concentration, have language study approved by Jewish Studies' director of undergraduate studies by the beginning of the first semester, freshmen year. Enroll in beginning language course (or language level applicable) during the first semester of freshmen year.
- Enroll in JWST/GSLL 2350 the second semester, freshmen year.
- Each semester, complete two Jewish Studies courses.
- The last spring semester in residence, complete the Capstone in Jewish Studies (JWST 4000).

Jewish Studies - Minor

The minor in Jewish studies is designed to help students develop a unique interdisciplinary perspective, building their critical thinking skills by exploring the world through the lens of Jewish studies. As the program in Jewish studies is inherently interdisciplinary, many students are easily able to fulfill Jewish studies minor requirements while simultaneously completing requirements for their major.

The minor in Jewish Studies is open to all students of all backgrounds, Jewish and non-Jewish.

Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. Students must complete 18 credit hours of Jewish studies requirements, of which 12 credit hours must be upper division (3000/4000). A grade of C- or better must be received in all courses used to satisfy the minor requirements. For more information, visit the program's Minor in Jewish Studies (<http://www.colorado.edu/jewishstudies/undergraduates/major-minors-jewish-studies/minor-jewish-studies>) webpage.

Required Courses and Semester Credit Hours

Required Course: 3

JWST/GSLL 2350	Introduction to Jewish Culture
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Additional Requirements:

Select one of the following: 3

JWST/HIST 1818	Introduction to Jewish History: Bible to 1492
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JWST/HIST 1828	Introduction to Jewish History: Since 1492
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Select four upper-division (3000-4000 level) Jewish Studies courses 12 from the following list or by approval of advisor.

JWST/RLST 3100	Judaism
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JWST/WGST 3200	Religion and Feminist Thought
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JWST/ RLST 3202/ WGST 3201	Women, Gender & Sexuality in Jewish Texts & Traditions
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JWST/ENGL 3310	The Bible as Literature
JWST 3401	The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe
JWST/GRMN 3501	German-Jewish Writers: From the Enlightenment to the Present
JWST/IAFS/ RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST/IAFS/ GSLI 3600	Contemporary Jewish Societies
JWST/IAFS 3610	Topics in International Affairs and Jewish Studies
JWST/IAFS 3650	History of Arab-Israeli Conflict
JWST 3930	Internship in Jewish Studies (not repeatable for minor)
JWST 4000	Capstone in Jewish Studies (Minors in Jewish Studies may take the Capstone in Jewish Studies (JWST 4000) and count it as one of their required upper division courses with approval from the Director of Undergraduate Studies for Jewish Studies.)
JWST/ANTH 4050	Anthropology of Jews and Judaism
JWST 4101	Topics in Hebrew Studies
JWST/MUSC 4122	Music in Jewish Culture
JWST/RLST 4170	God and Politics
JWST/RLST 4180	Is God Dead?
JWST 4203	Israeli Literature: Exile, Nation, Home
JWST/RLST 4260	Topics in Judaism
JWST 4302/ IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
JWST/HIST 4338	History of Modern Israel/Palestine
JWST/HIST 4348	Topics in Jewish History
JWST/HIST 4378	History of Modern Jewish-Muslim Relations
JWST/RUSS 4401	The Russian Jewish Experience
JWST/HIST 4454	Jewish Intellectual History
JWST/HIST 4534	Modern European Jewish History
JWST/HIST 4544	History of Yiddish Culture
JWST/ANTH 4580	The Holocaust: An Anthropological Perspective
JWST/ENGL 4677	Jewish-American Literature
JWST/HIST 4827	Modern U.S. Jewish History since 1880
JWST 4900	Independent Study in Jewish Studies

WRTG 3020 Topics in Writing (After the Holocaust)

Total Credit Hours

18

Lesbian, Gay, Bisexual, Transgender and Queer Studies

The Lesbian, Gay, Bisexual, Transgender and Queer Studies Certificate program is designed to help students develop a social, historical and cross-cultural understanding of gender and sexuality. By exploring the historical and contemporary experiences of lesbians, gay men, bisexuals and transgender people, the courses in the program encourage students to think critically about the function of sexuality and gender in the world around them. In doing so, students will be able to analyze the relationships between queer and normative sexualities and gender identities.

By developing an understanding of diverse sexual and gender identities, certificate program students apply the meaning and function of sexuality to a broad range of historical and contemporary institutions and societies.

Open to any student in the university, this interdisciplinary program consists of two required courses and a number of relevant courses offered by different departments.

View more information about the LGBTQ Studies Certificate program (<http://www.colorado.edu/lgbtq/certificate>), email lgbt@colorado.edu or call 303-492-8923.

Course code for this program is LGBT.

Certificate

- LGBTQ Studies - Certificate (p. 414)

LGBT 2000 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay, and transgender communities.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2030

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame
Arts Sci Core Curr: Human Diversity

LGBT 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2707

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

LGBT 3710 (3) Topics in LGBT Studies

Content varies by semester and reflects contemporary issues in the field of LGBT Studies.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

LGBT 3796 (3) Queer Theory

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3796

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

LGBT 3930 (3) Lesbian, Gay, Bisexual, Transgender, and Queer Studies Internship

Matches selected students with supervised internships in university programs and advocacy groups, local businesses, human service or government agencies. Internships will focus on lesbian, gay, bisexual, transgender or queer issues, such as anti-violence programs, educational outreach, and civil rights initiatives.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite LGBT 2000.

LGBT 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature. May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4287 and WGST 4287

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

LGBT 4400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, this course examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 5400 and WGST 4400 and WGST 5400

Grading Basis: Letter Grade

LGBT 4840 (3) Independent Study in LGBTQ Studies

Self-directed research project in LGBTQ studies supervised by a faculty member and approved by one of the Co-Directors of the LGBT Studies Certificate Program.

Repeatable: Repeatable for up to 6.00 total credit hours.

LGBTQ Studies - Certificate

Lesbian, gay, bisexual, transgender and queer (LGBTQ) studies at CU Boulder is an interdisciplinary undergraduate program encompassing more than 20 courses in a dozen departments.

LGBTQ studies involves the academic investigation of sexuality in established fields such as literature, history, theatre, law, medicine, economics, sociology, anthropology and political science. With its interdisciplinary approach, LGBTQ studies interweaves complex theories and analysis into the study of sexuality.

Through the certificate program and the guidance of faculty advisors, students are given an opportunity to integrate a wide variety of courses offered in the humanities, social sciences and natural sciences, to extend

and deepen their knowledge and understanding of societies and cultures and to relate that understanding to lived experience.

For more details including application instructions, visit the LGBTQ Studies Certificate (<http://www.colorado.edu/lgbtq/certificate>) webpage, or email lgbt@colorado.edu.

Requirements

Completion of the certificate in LGBTQ studies requires the completion of 18 credit hours (9 upper-division) of approved courses with grades of C or better.

Required Courses and Credit Hours

Required Courses

LGBT 2000	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies	3
LGBT 3796	Queer Theory	3

Electives

Twelve credit hours of approved elective courses, with at least 6 credit hours of upper-division electives¹

Total Credit Hours 18

¹ Up to six credit hours of independent study may be applied toward the certificate program.

Credits earned at other institutions may be transferred in partial fulfillment of the requirements upon approval of the program director. No more than 12 credit hours (6 upper-division) of transferred course work may be applied to the certificate.

Students are encouraged to meet with the program directors early in their course of study and again in the semester prior to the semester of graduation, to ensure that program requirements are met.

Available elective courses are listed each semester under the "Courses" tab of the program (<http://www.colorado.edu/lgbtq>) website.

Linguistics

Linguistics is the study of all aspects of human language: how languages make it possible to transmit ideas and feelings; how and why languages are similar and different; how we develop different styles and dialects; what will be required for computers to understand and produce spoken language; and how languages are used in everyday communication as well as in formal settings. Linguists try to figure out what it is that speakers know and do by observing the structure of languages, the way children learn language, slips of the tongue, conversations, storytelling, the acoustics of sound waves and the way people's brains react when they hear speech or read. Linguists also reconstruct prehistoric languages, and try to deduce the principles behind their evolution into the thousands of languages of the world today.

The major in linguistics is useful for careers involving cognitive science, computer science, psychology, international business, language teaching, advertising, publishing, law and documentation. Double majors and minors are encouraged with language, computer science, psychology, communication, sociology, anthropology, international affairs, philosophy and education.

The core of the major is a set of courses, taught in the Department of Linguistics, on the nature of language. In addition, the major requires

language courses offered by other departments (except for fluent speakers of languages other than English).

The undergraduate degree in linguistics emphasizes knowledge and awareness of:

- the fundamental architecture of language in the domains of phonetics and phonology, morphology and syntax and semantics and pragmatics;
- the diversity of languages structures;
- the main interactions between language, culture and society, including the role of language as a cultural institution and the social functions of language diversity; and
- the approaches to the study of language that are used by a discipline other than linguistics.

In addition, students completing the degree in linguistics are expected to acquire the ability and skills to:

- demonstrate proficiency in a second language equivalent to the third-year university level;
- infer language structures from the analysis of data from unfamiliar languages; and
- give coherent general interpretations of common language phenomena in terms of language structure and language use.

Course codes for this program are **LING** and **ESLG**.

Study Abroad

Language study and some courses in the major may be completed in university or university-affiliated study abroad programs, and such study is recommended. Students interested in doing part of their major work in a study abroad program should discuss the matter with their advisor before going abroad. For information on study abroad programs, consult the Office of International Education.

Graduation with Honors

The honors program in linguistics offers the opportunity for highly motivated undergraduates to undertake a deeper and more individualized study of linguistics than is provided by the regular BA curriculum. Linguistics majors with an overall grade point average of 3.30 or higher are eligible to participate in the program. Honors that may be earned are cum laude (with honors), magna cum laude (with high honors), and summa cum laude (with highest honors).

Students interested in pursuing departmental honors are encouraged to consult with the departmental honors advisor by the beginning of their junior year to ensure that they will be able to meet the requirements for departmental honors before graduation.

Bachelor's Degree

- Linguistics - Bachelor of Arts (BA) (p. 418)

Minor

- Linguistics - Minor (p. 419)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bell, Alan
Professor Emeritus

Cowell, James Andrew (https://experts.colorado.edu/display/fisid_107090)
Professor; PhD, University of California-Berkeley

Fox, Barbara (https://experts.colorado.edu/display/fisid_106066)
Professor; PhD, University of California-Los Angeles

Frajzyngier, Zygmunt (https://experts.colorado.edu/display/fisid_104000)
Professor; PhD, Univ of Warsaw (Poland)

Hall, Kira (https://experts.colorado.edu/display/fisid_123111)
Associate Professor; PhD, University of California-Berkeley

Hulden, Mans Elis (https://experts.colorado.edu/display/fisid_154602)
Assistant Professor; PhD, University of Arizona

Hulden, Vilja Paivikki (https://experts.colorado.edu/display/fisid_154910)

Menn, Lise
Professor Emeritus

Michaelis-Cummings, Laura A (https://experts.colorado.edu/display/fisid_105599)
Professor; PhD, University of California-Berkeley

Narasimhan, Bhuvanewari (https://experts.colorado.edu/display/fisid_144863)
Associate Professor; PhD, Boston University

Palmer, Martha (https://experts.colorado.edu/display/fisid_138162)
Professor; PhD, Univ of Edinburgh (Scotland)

Scarborough, Rebecca Anne (https://experts.colorado.edu/display/fisid_143741)
Associate Professor; PhD, University of California-Los Angeles

Shay, Maire Erin Jean (https://experts.colorado.edu/display/fisid_110594)
Asst Professor Adjunct

Taylor, Allan R.
Professor Emeritus

Thomas-Ruzic, Maria L (https://experts.colorado.edu/display/fisid_143443)
Senior Instructor

ESLG 1130 (2) Accent Reduction for Foreign Students

Provides oral activities with authentic English materials to reduce accents and to increase intelligibility for U.S. academic situations. Evaluates individual problem areas and includes one-on-one meetings with the native-speaker instructor. Improves overall articulation and fluency. Does not fulfill humanities or major requirements.

Equivalent - Duplicate Degree Credit Not Granted: ESLG 1210 or ESLG 1410

ESLG 1140 (2) Presentation Skills for International Students

Provides instruction and practice to improve classroom oral communication skills necessary for effective participation in the U.S. academic setting, either as an international TA or RA, graduate or undergraduate student. Evaluates individual problem areas and includes digital audio and video recording with extensive feedback from the native-speaker instructor. Improves oral competence and listening comprehension in English for international students.

Recommended: Prerequisite ESLG 1130.

ESLG 1210 (2) Academic Writing for Foreign Students

Addresses the development of paragraphs and full-length essays. Focus areas include organization and style, grammar and vocabulary and conventions of academic writing, including incorporating the ideas of others and citing sources appropriately. Extensive instructor feedback provided. Improves fluency and precision in academic writing. Does not fulfill humanities or major requirements.

Equivalent - Duplicate Degree Credit Not Granted: ESLG 1130 or ESLG 1410

ESLG 1222 (2) Advanced Written Composition for Foreign Students

Continued practice in academic writing, including incorporating the ideas of others and citing sources appropriately. Extensive instructor feedback provided. Preparation, writing, and revising of a full-length academic term/research paper or work on chapters for a master's thesis or doctoral dissertation. Does not fulfill humanities or major requirements.

Recommended: Prerequisite ESLG 1210.

ESLG 1410 (3) Academic English Skills for International Students

Provides instruction and practice to improve academic speaking and writing skills for effective participation in U.S. universities. Speaking includes accent reduction and effective communication through oral activities and recordings. Writing addresses development of paragraphs and full-length papers, including organization, grammar, vocabulary, incorporating ideas of others and citing sources appropriately. Instructor feedback helps students improve fluency in both speaking and writing. Restricted to non-native speakers of English.

Equivalent - Duplicate Degree Credit Not Granted: ESLG 1130 or ESLG 1210

LING 1000 (3) Language in U.S. Society

Nontechnical exploration of the ways that language is used in America. Emphasizes language as a social institution and how values and goals of both public institutions and private groups shape and are shaped by language and its use.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Arts Sci Core Curr: United States Context
MAPS Course: Social Science

LING 1010 (3) The Study of Words

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1010

LING 1020 (3) Languages of the World

Explores the issue of human diversity by examining how languages vary around the world. Outlines historical, geographic, and typological classifications of languages across human societies, and the criteria used by linguists for grouping them into language families. Theorizes the relationship between linguistic and cognitive diversity, and considers the impact of language death on humanity. No formal training in linguistics is required.

Additional Information: Arts Sci Core Curr: Human Diversity

LING 1500 (3) Understanding Grammar

Presents fundamentals of grammar in the Western tradition. Emphasizes making concepts and uses of grammar (as exemplified in English and closely related foreign languages) understandable to the nonspecialist.

LING 1900 (1) Service Learning Practicum: Adult Literacy

Practicum for selected students in LING 1000. Provides practical experience of the impact of illiteracy on individuals, families, and the community at large. Coregistration in service learning recitation is required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of LING 1000 (prereq minimum grade C-).

Grading Basis: Pass/Fail

LING 2000 (3) Introduction to Linguistics

Introduces the study of languages as structural systems. Principles of sound patterns, word formation, meaning, and sentence structure. Gives attention to language acquisition, psycholinguistics, language families, dialects, historical change in languages, and different language types.

Additional Information: MAPS Course: Social Science

LING 2400 (3) Language, Gender and Sexuality

Familiarizes students with the effects of gender on language use; discusses popular beliefs and scholarly theories about language and communication. Provides students with tools for exploring the role of language and gender.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

LING 3005 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications, and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and PHIL 3310 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

LING 3100 (3) Language Sound Structures

Introduces the sounds of languages and their organization into phonological structures.

Recommended: Prerequisite LING 2000.

LING 3220 (3) American Indian Languages in their Social and Cultural Context

A sampling of the many indigenous languages and cultures found in America. Emphasizes the United States, but also gives attention to the languages of Canada and Latin America.

Recommended: students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Human Diversity

LING 3430 (3) Semantics

Theoretical and practical study of meaning in natural language. Considers both semantic theories and semantic phenomena from diverse languages. Does not treat techniques for improving the use of language.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Linguistics (LING) majors only.

Recommended: Prerequisite LING 2000.

LING 3545 (3) World Language Policies

Examines the economic and sociopolitical impact of choosing English vs. other languages in the U.S. Introduces the study of language policies, rights, and planning in other countries, including the worldwide use of English in social, business, and legal contexts.

LING 3630 (3) Principles and Practices in Teaching English to Speakers of Other Languages

Provides a practical overview of principles and practices in TESOL in its global context. Introduces methods and materials (texts, media, tools) and standards for teaching, learning and assessment. Includes lesson observation, planning and micro-teaching focused especially on listening, speaking and pronunciation. Assumes some background and/or interest in linguistics and language and applications to teaching English to adults/young adults.

Requisites: Requires a prerequisite or corequisite course of LING 2000 (minimum grade C).

Grading Basis: Letter Grade

LING 3800 (1-4) Special Topics in Linguistics

Intensive study of a selected area or problem in linguistics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

LING 4050 (3) Japanese Sociolinguistics: Japanese Language and Society

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4050 and JPNS 5050

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Grading Basis: Letter Grade

LING 4100 (3) Perspectives on Language

Provides extended critical examination of a few selected issues, chosen each term for their general interest and relevance, e.g., the relation between language and thought, or human language vs. animal languages, and computer languages.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite LING 2000.

LING 4220 (3) Language and Mind

Studies topics such as speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4220

Recommended: Prerequisites PSYC 1001 and LING 2000.

LING 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4225

Recommended: Prerequisites PSYC 1001 and LING 2000.

Grading Basis: Letter Grade

LING 4420 (3) Morphology and Syntax

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

Equivalent - Duplicate Degree Credit Not Granted: LING 5420

Recommended: Prerequisite LING 2000.

LING 4450 (3) Introduction to Formal Syntax

Introduces formal generative grammar, including determining constituent structure, drawing trees, writing rules, understanding the properties of the lexicon and their interaction with syntax, X-bar theory and its modifications and movement analysis.

Recommended: Prerequisite LING 4420.

LING 4560 (3) Language Development

Emphasizes acquisition of language by young children; development in later years and into adulthood is also treated. Particular attention given to roles of environment and of neurophysiological endowment in learning to communicate with words, sentences, and narratives.

Equivalent - Duplicate Degree Credit Not Granted: SLHS 4560 and PSYC 4560

Requisites: Restricted to Linguistics (LING) majors only.

Recommended: Prerequisites LING 2000 and PSYC 1001.

LING 4610 (3) English Structure for Teachers of English to Speakers of Other Languages

Description of morphological and syntactic categories and structures of English.

Equivalent - Duplicate Degree Credit Not Granted: LING 5610

Recommended: Prerequisite LING 2000.

LING 4800 (3) Language and Culture

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4800

Recommended: Prerequisite LING 1000 or LING 2400 or ANTH 2100.

LING 4830 (3) Honors Thesis

Required for students who elect departmental honors. Students write an honors thesis based on independent research under the direction of a faculty member.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sciences Honors Course

LING 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

LING 4910 (3) TESOL (Tching English to Spkrks of Other Languages) Practicum

Provides the field-based component and practical experience in English language teaching for the TESOL Certificate. Work on site includes class observations and supervised teaching in community-based programs/ESL providers. Weekly meetings provide opportunities to debrief/discuss teaching practice and connect theory, methods and practice. Supports professional development, completion of a teaching resume and portfolio and the job search process.

Equivalent - Duplicate Degree Credit Not Granted: LING 5910

Requisites: Requires prerequisite courses of LING 2000 and LING 3630 (minimum grade C).

Grading Basis: Letter Grade

Linguistics - Bachelor of Arts (BA)

The CU Department of Linguistics has a strong commitment to excellence in teaching at both the graduate and undergraduate levels. The linguistics faculty offers a wide range of research strengths—including syntactic theory, socio-cultural linguistics, computational and psycholinguistics, phonetics/phonology and language documentation—ensuring that students can gain both versatility and expertise in an array of subfields.

Our educational mission is to provide students with insight into the fundamental design features of language—its sound patterns, its word- and sentence formation devices, its semantic structure—and to create awareness of language varieties: the diversity of human languages, the role of language as an index of social identity and the ontogenetic and historical development of language.

Concurrent Degree Program

BA/MA in Linguistics

The department has a five-year concurrent bachelor's and master's degree program, which is recommended only for the most serious and able graduate students. For further information, see the graduate advisor in the spring of the sophomore year or during the first week of the fall semester of the junior year.

Requirements

Majors in linguistics must complete a total of 32 credit hours of study in general linguistics, including 5 in a natural language (for exceptions, see below). Language study is taken in other departments.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Required Courses and Semester Credit Hours

General Linguistics Courses

LING 2000	Introduction to Linguistics ¹	3
LING 3100	Language Sound Structures ¹	3
LING 3430	Semantics ¹	3
LING 4420	Morphology and Syntax ¹	3

Natural Language

Complete a minimum of 5 credit hours of study of a natural language other than English (see details below) with a grade of C- (2.00) or better.

Electives

Select a minimum of 15 elective credit hours from the following with a grade of C- (2.00) or better.

ENGL 4003	Introduction to Old English
FREN 3020	French Phonetics Through Musical Performance
FREN 3010	French Phonetics and Pronunciation
JPNS 4030	Japanese Syntax
JPNS 4080	Kanji in Japanese Orthography
JPNS 4070	Second Language Acquisition of Japanese
LING 1000	Language in U.S. Society
LING 1010	The Study of Words
LING 1020	Languages of the World
LING 2400	Language, Gender and Sexuality
LING 3005	Cognitive Science
LING 3220	American Indian Languages in their Social and Cultural Context
LING 3545	World Language Policies
LING 3800	Special Topics in Linguistics
LING 4100	Perspectives on Language
LING 4220	Language and Mind
LING 4225	Interdisciplinary Research Methods in Child Language Acquisition
LING 4450	Introduction to Formal Syntax
LING 4560	Language Development
LING 4610	English Structure for Teachers of English to Speakers of Other Languages
LING 4800	Language and Culture

Other upper-division linguistics courses may also be chosen if available; graduate courses may be taken with permission of the department.

Total Credit Hours 32

¹ Complete with a grade of C- or better.

Natural Language

Students must complete with a grade of C- (2.00) or better a minimum of 5 credit hours of study of a natural language other than English (including signed languages used by deaf communities). The 5 credit hours offered in satisfaction of this requirement must be at the 3000 level or above for widely-taught languages (French, German, Latin, Spanish), or at the 2000 level or above for less-widely-taught languages (Arabic, American Sign Language, Chinese, Farsi, Greek, Hebrew, Hindi, Indonesian, Italian, Japanese, Korean, Norwegian, Portuguese, Russian, Swedish).

Only courses taught in the language in question, and focused specifically on language learning, may be used for this requirement. A list of all the approved courses is available from the Department of Linguistics or the departmental undergraduate advisor.

The natural language requirement may be satisfied by examination or waived for foreign students whose native language is not English; in these cases, students must still meet the college minimum major requirement of 18 credit hours of upper-division course work and 30 credit hours overall in the major. Students who wish to have their language requirement waived must obtain the consent of an undergraduate advisor before registering for the fall term of the junior year.

Additional Information

The department recommends that prospective majors complete LING 2000 and at least two 1000-level foreign language courses (in the same language) by the end of the sophomore year, unless the student's foreign language proficiency is already advanced.

The fall semester of the junior year should include LING 3430, a 2000-level foreign language course, and a linguistics elective or LING 4420. It must also include LING 2000 if that was not taken earlier. The spring semester of the junior year should include LING 3100, a linguistics elective and a further 2000-level foreign language course (if needed to prepare the student for the required upper-division foreign language credit hours).

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here refers only to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in linguistics, students should meet the following requirements:

- By the beginning of the spring semester of the freshman year (second semester), declare linguistics as a major.
- During the freshman or sophomore years (first through fourth semesters), take LING 2000 (required) and LING 1000 or LING 2400 (electives)
- By the end of the sophomore year (fourth semester) at the latest, complete two semesters of study of a natural (spoken or signed) language other than English.*
- During the junior year (fifth and sixth semesters) at the latest, continue natural language study at the 2000 level.
- During the fall of the junior year (fifth semester), take one or both of LING 3430 or LING 4420.
- During the junior or senior year (fifth through eighth semesters), take the remaining courses as needed.
- During the spring of the junior year (sixth semester), take LING 3100 and an upper-division linguistics elective.
- During the senior year (seventh and eighth semesters) at the latest, take 5 credit hours of natural language study at the 3000 level.*

*The language requirement is waived for native speakers of a language other than English, but if it is waived, 6 additional upper-division credit hours in linguistics must be taken.

Note: A linguistics major who has been excluded from any upper-division linguistics course due to enrollment limitations will be given first preference for a seat in that course the following year if the exclusion is made known to the department staff within two weeks after it occurs. No declared linguistics major who still needs LING 2000 for fall of the junior year and attempts to register for it during the regular registration period for continuing students (spring of the sophomore year) will be excluded from the course.

Linguistics - Minor

One good reason to take the linguistics minor is that by learning to analyze language and evaluate claims about language, students can improve the quality of their writing and argumentation in their major discipline.

Students can profitably combine the linguistics minor with a major in one of the modern languages, classics, psychology or speech, hearing and language science, to name just a few possibilities.

Requirements

Declaration of a minor in linguistics is open to any student enrolled at CU Boulder, regardless of college or school.

Students minoring in linguistics must complete a total of 18 credit hours in linguistics, 9 of which must be at the upper-division level. Students must maintain an overall and linguistics GPA of at least 2.00 (C), and complete all LING courses with a C- or better.

Required Course and Semester Credit Hours

Required Courses

LING 2000	Introduction to Linguistics	3
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Electives

Select two of the following:		6
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LING 3100	Language Sound Structures
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LING 3430	Semantics
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LING 4420	Morphology and Syntax
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Take the remaining one of the three courses listed above and/or select from the following electives to bring the total credit hours to 18: ¹		9
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LING 1000	Language in U.S. Society
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LING 1010	The Study of Words
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LING 1020	Languages of the World
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LING 2400	Language, Gender and Sexuality
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LING 3005	Cognitive Science
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LING 3220	American Indian Languages in their Social and Cultural Context
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LING 3545	World Language Policies
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LING 3800	Special Topics in Linguistics
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LING 4100	Perspectives on Language
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LING 4220	Language and Mind
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LING 4225	Interdisciplinary Research Methods in Child Language Acquisition
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LING 4450	Introduction to Formal Syntax
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LING 4560	Language Development
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LING 4610	English Structure for Teachers of English to Speakers of Other Languages
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LING 4800	Language and Culture
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Total Credit Hours		18
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¹ At least 3 credit hours of the electives must be in an upper-division course.

Mathematics

The Department of Mathematics offers courses leading to either a Bachelor of Arts (BA) degree in Mathematics or a minor in Mathematics. Students who choose to major in Mathematics choose from one of five tracks for the major:

1. **Comprehensive track:** The comprehensive track emphasizes theoretical mathematics, and is aimed at students seeking a general

background in mathematics or intending to pursue graduate work in mathematics.

2. **Applicable track:** The applicable track is aimed at students seeking a background in applied and/or applicable mathematics.
3. **Secondary Education track:** The secondary education track is designed to align with the Colorado licensure requirements for mathematics secondary education, and the university does offer a program for obtaining secondary education mathematics teaching licensure.
4. **Computational track:** The computational track is designed for students with an interest in the intersection of mathematics and computer science.
5. **Statistics track:** The statistics track is designed for students seeking a background in statistics and/or data science.

Course code for this program is MATH.

Bachelor's Degree

- Mathematics - Bachelor of Arts (BA) (p. 425)

Minor

- Mathematics - Minor (p. 427)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baggett, Lawrence W.
Professor Emeritus

Beaudry, Agnès (https://experts.colorado.edu/display/fisid_157677)
Assistant Professor; PhD, Northwestern University

Black, John (https://experts.colorado.edu/display/fisid_126540)
Associate Professor; PhD, University of California-Davis

Bronstein, Albert
Instructor; PhD, University of Kentucky Lexington

Brown, Gordon E.
Professor Emeritus

Casalaina-Martin, Sebastian Ben (https://experts.colorado.edu/display/fisid_145845)
Associate Professor; PhD, Columbia University In the City of New York

Clelland, Jeanne Nielsen (https://experts.colorado.edu/display/fisid_113103)
Professor; PhD, Duke University

Clements, George F.
Professor Emeritus

Czubak, Magdalena (https://experts.colorado.edu/display/fisid_157955)
Assistant Professor; PhD, University of Texas at Austin

Elliott, Peter D (https://experts.colorado.edu/display/fisid_105048)
Professor; PhD, University of Cambridge (England)

Englander, Janos (https://experts.colorado.edu/display/fisid_147333)
Associate Professor; PhD, Israel Inst of Tech (Israel)

Enoka, Roger M (https://experts.colorado.edu/display/fisid_110122)
PhD, University of Washington

Farsi, Carla Emilia (https://experts.colorado.edu/display/fisid_101437)
Professor; PhD, University of Maryland College Park Campus

Fox, Jeffrey S (https://experts.colorado.edu/display/fisid_105586)
Professor; PhD, University of California-Berkeley

Goodrich, Robert K.
Professor Emeritus

Gorokhovskiy, Alexander (https://experts.colorado.edu/display/fisid_126279)
Professor; PhD, Ohio State University

Grant, David R (https://experts.colorado.edu/display/fisid_100868)
Professor; PhD, Massachusetts Institute of Technology

Green, Richard Mutegeki (https://experts.colorado.edu/display/fisid_129800)
Professor; MA, Oxford Univ (England)

Gustafson, Karl E (https://experts.colorado.edu/display/fisid_104877)
Professor; PhD, University of Maryland College Park Campus

Hermes, Henry G.
Professor Emeritus

Holley, Richard A.
Professor Emeritus

Ih, Su-Ion (https://experts.colorado.edu/display/fisid_141091)
Associate Professor; PhD, Brown University

Jesudason, Judith Packer (https://experts.colorado.edu/display/fisid_100338)
Professor; PhD, Harvard University

Jones, William B.
Professor Emeritus

Kearnes, Keith (https://experts.colorado.edu/display/fisid_118457)
Professor; PhD, University of California-Berkeley

Kuznetsov, Sergei Eugenievitch (https://experts.colorado.edu/display/fisid_113246)
Associate Professor; DSc, Vilnius State Univ (Lithuania)

Liu, Faan Tone
Instructor; PhD, University of Colorado at Boulder

Lundell, Albert T.
Professor Emeritus

Macrae, Robert Eugene
Professor Emeritus

Malitz, Jerome I.
Professor Emeritus

Manley, Kevin W (https://experts.colorado.edu/display/fisid_142342)
Instructor; PhD, University of Colorado Boulder

Mayr, Peter (https://experts.colorado.edu/display/fisid_155858)
Assistant Professor; Dr habil, Johannes Kepler University Linz (Austria)

Monk, James Donald
Professor Emeritus

Mycielski, Jan
Professor Emeritus

O'Rourke, Sean Daniel (https://experts.colorado.edu/display/fisid_154418)
Assistant Professor; PhD, University of California-Davis

Pflaum, Markus Josef (https://experts.colorado.edu/display/fisid_144979)
Professor; Dr habil, Humboldt Univ of Berlin (Germany)

Ramsay, Arlan
Professor Emeritus

Rearick, David F.
Professor Emeritus

Roberson, Lee
Instructor; PhD, University of Northern Colorado

Roth, Richard L.
Professor Emeritus

Sather, Duane P.
Professor Emeritus

Schmidt, Wolfgang
Professor Emeritus

Spina, Alejandro (https://experts.colorado.edu/display/fisid_104240)
Senior Instructor; PhD, University of Colorado Boulder

Stade, Eric (https://experts.colorado.edu/display/fisid_100456)
Professor; PhD, Columbia University In the City of New York

Struik, Ruth Rebekka
Professor Emeritus

Szendrei, Agnes Erzsebet (https://experts.colorado.edu/display/fisid_130160)
Professor; DSc, Hungarian Academy of Sciences (Hungary)

Thiem, Franz Nathaniel (https://experts.colorado.edu/display/fisid_144618)
Associate Professor; PhD, University of Wisconsin-Madison

Tubbs, Robert (https://experts.colorado.edu/display/fisid_101761)
Associate Professor; PhD, Pennsylvania State University

Varanasi, Mahesh K (https://experts.colorado.edu/display/fisid_103090)
Professor; PhD, Rice University

Vernerey, Divya E. (https://experts.colorado.edu/display/fisid_145131)
Instructor; PhD, Northwestern University

Walter, Martin E (https://experts.colorado.edu/display/fisid_105263)
Professor; PhD, University of California-Irvine

Wise, Jonathan S (https://experts.colorado.edu/display/fisid_151516)
Assistant Professor; PhD, Brown University

Wolkowisky, Jay H.
Professor Emeritus

MATH 1005 (3) Introduction to College Mathematics

Introductory level mathematics course which presents a college level introduction to algebraic functions and their applications. Only offered through the Student Academic Service Center.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1011

Additional Information: MAPS Course: Mathematics

MATH 1011 (3) College Algebra

Covers simplifying algebraic expressions, factoring, linear and quadratic equations, inequalities, exponentials, logarithms, functions, graphs and systems of equations. Department enforced prerequisite: one year high school algebra.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1005

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
MAPS Course: Mathematics

MATH 1012 (3) Quantitative Reasoning and Mathematical Skills

Promotes mathematical literacy among liberal arts students. Teaches basic mathematics, logic, and problem-solving skills in the context of higher level mathematics, science, technology, and/or society. This is not a traditional math class, but is designed to stimulate interest in and appreciation of mathematics and quantitative reasoning as valuable tools for comprehending the world in which we live.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1012

Additional Information: GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

MAPS Course: Mathematics

MATH 1021 (3) College Trigonometry

Covers trigonometric functions, identities, solutions of triangles, addition and multiple angle formulas, inverse and trigonometric functions and laws of sines and cosines. Department enforced prerequisite: MATH 1011 (minimum grade C-) or 1 1/2 years of high school algebra and 1 year of high school geometry.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1235 or MATH 1150

MATH 1071 (3) Finite Mathematics for Social Science and Business

Discusses systems of linear equations and introduces matrices, linear programming, and probability.

Requisites: Requires prerequisite course of MATH 1011 (minimum grade C-) or a score of 46% or greater on an ALEKS math exam taken in 2016 or earlier.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1081 (3) Calculus for Social Science and Business

Covers differential and integral calculus of algebraic, logarithmic and exponential functions. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 or MATH 1300 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1110 (3) Mathematics for Elementary Educators 1

Includes a study of problem solving techniques in mathematics and the structure of number systems. Department enforced prereq., one year of high school algebra and one year of geometry. Department enforced restriction: restricted to prospective elementary teachers. The combination MATH 1110 and 1120 is approved for arts and sciences core curriculum: quantitative reasoning and mathematical skills.

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1112 (4) Mathematical Analysis in Business

Gives students experience with mathematical problem solving in real business contexts. Students will work with data and spreadsheets to build and analyze mathematical models. Themes of the course include applying logical operators to model business rules, interpreting data and using tables and graphs, finding break-even and optimal points, and addressing uncertainty and forecasting

Equivalent - Duplicate Degree Credit Not Granted: MATH 1012

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1120 (3) Mathematics for Elementary Educators 2

Topics include geometry, measurement, probability, and statistics. Department enforced restriction: restricted to prospective elementary teachers. The combination MATH 1110 and 1120 is approved for arts and sciences core curriculum: quantitative reasoning and mathematical skills.

Requisites: Requires prerequisite course of MATH 1110 (minimum grade C-).

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1130 (3) Mathematics from the Visual Arts

Introduces mathematical concepts through the study of visual arts.

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1150 (4) Precalculus Mathematics

Develops techniques and concepts prerequisite to calculus through the study of trigonometric, exponential, logarithmic, polynomial and other functions. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1235 or MATH 1021

Requisites: Requires prerequisite course of MATH 1011 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework. Requires enrollment in corequisite course MATH 1151.

Additional Information: GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr. Quant Reasn Mathmat Skills

MAPS Course: Mathematics

MATH 1151 (1) Precalculus Supplemental Lab

Provides students concurrently enrolled in MATH 1150 with supplemental instruction.

Requisites: Requires enrollment in corequisite course of MATH 1150.

Grading Basis: Letter Grade

MATH 1160 (3) Transition to Calculus (IBL): The Theory, Applications and Analysis of Functions

Examines the functions of calculus and how they can be used to model concrete problems and/or change. This is an intensive study of these functions through Inquiry-Based Learning. Each class will be designed so students will be actively engaged in learning the material in small groups. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Requisites: Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

MATH 1212 (3) Data and Models

Engages students in statistical and algebraic problem solving through modeling data and real world questions taken from the social and life sciences. The course will emphasize these skills and the mathematical background needed for a university level statistics course.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1011

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1300 (5) Calculus 1

Topics include limits, derivatives of algebraic and transcendental functions, applications of the derivative, integration and applications of the definite integral. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 MATH 1081 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of MATH 1011 and MATH 1021 or MATH 1150 or MATH 1160 or APPM 1235 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1310 (5) Calculus, Systems, and Modeling

Calculus concepts are developed through the analysis and modeling of complex systems, ranging from gene networks and cells to populations and ecosystems. Fundamental concepts of probability and statistics are also developed through the lens of calculus. MATH 1300 is similar, but a greater emphasis is placed on relevance and applications in biology and other life sciences. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1330

Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1330 (4) Calculus for Economics and the Social Sciences

A calculus course intended to meet the needs of social science and economics majors, including applications. Covers differential and integral calculus of algebraic, logarithmic and exponential functions and modeling. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310

Requisites: Requires a prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 2001 (3) Introduction to Discrete Mathematics

Introduces the ideas of rigor and proof through an examination of basic set theory, existential and universal quantifiers, elementary counting, discrete probability, and additional topics. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

MATH 2130 (3) Introduction to Linear Algebra for Non-Mathematics Majors

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who do not plan to major in Mathematics. Formerly MATH 3130.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2135 or APPM 3310

Requisites: Requires prerequisite course of MATH 2300 or APPM 1360 (minimum grade C-).

MATH 2135 (3) Introduction to Linear Algebra for Mathematics Majors

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who plan to major in Mathematics. Formerly MATH 3135.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2130 or APPM 3310

Requisites: Requires a prerequisite course of MATH 2300 or APPM 1360 and MATH 2001 (all minimum grade C-).

MATH 2300 (5) Calculus 2

Continuation of MATH 1300. Topics include transcendental functions, methods of integration, polar coordinates, differential equations, improper integrals, infinite sequences and series, Taylor polynomials and Taylor series. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: APPM 1360

MATH 2380 (3) Mathematics for the Environment

An interdisciplinary course where environmental issues, such as climate change, global epidemics, pollution, population models and kinship relations of Australian Aborigines are studied with elementary mathematics (such as fuzzy logic). Similar techniques are applied to analyze other current events, such as surveillance, economic meltdowns, identity theft and media literacy. Department enforced prerequisite: proficiency in high school mathematics.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 2400 (5) Calculus 3

Continuation of MATH 2300. Topics include vectors, three-dimensional analytic geometry, partial differentiation and multiple integrals, and vector analysis. Department enforced prerequisite: MATH 2300 or APPM 1360 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: APPM 2350

MATH 2510 (3) Introduction to Statistics

Elementary statistical measures. Introduces statistical distributions, statistical inference, hypothesis testing and linear regression. Department enforced prerequisite: two years of high school algebra.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 1020

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
MAPS Course: Mathematics

MATH 3001 (3) Analysis 1

Provides a rigorous treatment of the basic results from elementary Calculus. Topics include the topology of the real line, sequences of numbers, continuous functions, differentiable functions and the Riemann integral.

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2130 or MATH 2135 (all minimum grade C-).

MATH 3110 (3) Introduction to Theory of Numbers

Studies the set of integers, focusing on divisibility, congruences, arithmetic functions, sums of squares, quadratic residues and reciprocity, and elementary results on distributions of primes.

Requisites: Requires prerequisite course of MATH 2001 (minimum grade C-).

MATH 3120 (3) Functions and Modeling

Engages the students in daily projects and occasional in-class labs designed to strengthen and expand knowledge of the topics in secondary mathematics, focusing especially on topics from algebra, precalculus and calculus. Projects and labs involve the use of multiple representations, transformations, data analysis techniques and interconnections among ideas from geometry, algebra, probability and calculus. Department enforced prereq., MATH 1300 or MATH 1310 or APPM 1350 (minimum grade C-).

Requisites: Requires prerequisite course of MATH 2001 (minimum grade C-).

MATH 3140 (3) Abstract Algebra 1

Studies basic properties of algebraic structures with a heavy emphasis on groups. Other topics, time permitting, may include rings and fields.

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 3170 (3) Combinatorics 1

Covers basic methods and results in combinatorial theory. Includes enumeration methods, elementary properties of functions and relations, and graph theory. Emphasizes applications.

Requisites: Requires prerequisite course of MATH 2001 (minimum grade C-).

MATH 3210 (3) Euclidean and Non-Euclidean Geometry

Axiomatic systems; Euclid's presentation of the elements of geometry; Hilbert's axioms; neutral, Euclidean and non-Euclidean geometries and their models.

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 3430 (3) Ordinary Differential Equations

Involves an elementary systematic introduction to first-order scalar differential equations, nth order linear differential equations, and n-dimensional linear systems of first-order differential equations. Additional topics are chosen from equations with regular singular points, Laplace transforms, phase plane techniques, basic existence and uniqueness and numerical solutions. Formerly MATH 4430.

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) or APPM 3310 (all minimum grade C-).

MATH 3450 (3) Introduction to Complex Variables

Theory of functions of one complex variable, including integrals, power series, residues, conformal mapping, and special functions. Formerly MATH 4450.

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 (minimum grade C-).

MATH 3510 (3) Introduction to Probability and Statistics

Introduces the basic notions of Probability: random variables, expectation, conditioning, and the standard distributions (Binomial, Poisson, Exponential, Normal). This course also covers the Law of Large Numbers and Central Limit Theorem as they apply to statistical questions: sampling from a random distribution, estimation, and hypothesis testing.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2510 or MATH 4510

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2300 or APPM 1360 (all minimum grade C-).

MATH 3850 (1) Seminar in Guided Mathematics Instruction

Provides learning assistants with an opportunity to analyze assessment data for formative purposes and develop instructional plans as a result of these analyses. These formative assessment analyses will build on the literature in the learning sciences. Students gain direct experiences interacting with the tools of the trade, especially with actual assessment data and models of instruction. Restricted to learning assistants in Math.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a corequisite course of EDUC 4610.

Grading Basis: Pass/Fail

MATH 4000 (3) Foundations of Mathematics

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5000

Requisites: Requires prerequisite courses of MATH 2001 and MATH 3001 or MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) or MATH 3140 or MATH 3210 (all minimum grade C-).

MATH 4001 (3) Analysis 2

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

Equivalent - Duplicate Degree Credit Not Granted: MATH 5001

Requisites: Requires prerequisite courses of MATH 3001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 4120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5120 and APPM 4120 and APPM 5120

Requisites: Requires prerequisite course of MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) or APPM 3310 (minimum grade C-).

MATH 4140 (3) Abstract Algebra 2

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5140

Requisites: Requires prerequisite course of MATH 3140 (minimum grade C-).

MATH 4200 (3) Introduction to Topology

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5200

Requisites: Requires prerequisite course of MATH 3001 (minimum grade C-).

MATH 4230 (3) Differential Geometry of Curves and Surfaces

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5230

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) and MATH 2001 (all minimum grade C-).

MATH 4240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5240

Requisites: Requires prerequisite courses of MATH 3001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 4330 (3) Fourier Analysis

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5330

Requisites: Requires prerequisite course of MATH 3001 (minimum grade C-).

MATH 4440 (3) Mathematics of Coding and Cryptography

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5440

Requisites: Requires prerequisite course of MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (minimum grade C-).

MATH 4470 (3) Partial Differential Equations

Studies initial, boundary, and eigenvalue problems for the wave, heat, and potential equations. Solution by separation of variables, Green's function, and variational methods.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5470

Requisites: Requires prerequisite courses of MATH 3430 (minimum grade C-).

MATH 4510 (3) Introduction to Probability Theory

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

Equivalent - Duplicate Degree Credit Not Granted: APPM 3570 or ECEN 3810 or MATH 3510 MATH 5510

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 4520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5520 and APPM 4520 and APPM 5520

Requisites: Requires prerequisite course of MATH 4510 or APPM 3570 (minimum grade C-).

MATH 4540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5540 and APPM 4540 and APPM 5540

Requisites: Requires prerequisite course of MATH 4520 or APPM 4520 (minimum grade C-).

MATH 4650 (3) Intermediate Numerical Analysis 1

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced restriction: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4650

Requisites: Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

MATH 4660 (3) Intermediate Numerical Analysis 2

Continuation of MATH 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4660

Requisites: Requires prerequisite course of MATH 4650 (minimum grade C-).

MATH 4730 (3) Set Theory

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5730

Requisites: Prereq. courses of MATH 2001 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

MATH 4805 (1) Mathematical Teacher Training: Inclusive Pedagogy

Designed to train students to teach mathematics in an inclusive, multicultural environment. Students teach a math course within the McNeill Academic Program (Student Academic Services Center) meeting weekly with faculty and colleagues to learn to re-design curriculum, fine-tune pedagogical practices, create assessments, mentor undergraduate instructor assistants and create an inclusive classroom environment.

Department enforced restriction: experience with college-level instruction.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

MATH 4810 (1-3) Special Topics in Mathematics

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5810

Repeatable: Repeatable for up to 7.00 total credit hours.

MATH 4820 (3) History of Mathematical Ideas

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5820

Requisites: Prereq. courses of MATH 2001 and one of the following:

MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

Recommended: completion of upper division Written Communication requirement.

MATH 4890 (1-3) Honors Independent Study

Offered for students doing a thesis for departmental honors.

Additional Information: Arts Sciences Honors Course

MATH 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Mathematics - Bachelor of Arts (BA)

The undergraduate degree in mathematics emphasizes knowledge and awareness of:

- calculus of several variables and vector analysis;
- the structure of mathematical proofs and definitions;
- basic linear algebra and the theory of vector spaces;
- basic real analysis of one variable;
- at least one additional specialized area of mathematics.

In addition, students completing a degree in mathematics are expected to acquire the ability and skills to:

- move from concrete to abstract thinking and back with facility;
- recognize patterns and connections between areas of mathematics and between mathematics and other subjects;
- organize and construct a logical argument, provide evidence to support arguments and articulate arguments clearly and succinctly, both verbally and in writing.

The mathematics program offers five tracks that lead to the BA degree.

All five tracks require Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135, and MATH 3001.

Comprehensive Track

The comprehensive track emphasizes theoretical mathematics, and is aimed at students seeking a general background in mathematics or intending to pursue graduate work in mathematics.

Applicable Track

The applicable track is aimed at students seeking a background in applied and/or applicable mathematics.

Secondary Education Track

The secondary education track is designed to align with the Colorado licensure requirements for mathematics secondary education, and the university does offer a program for obtaining secondary education mathematics teaching licensure.

Computational Track

The computational track is designed for students with an interest in the intersection of mathematics and computer science.

Statistics Track

The statistics track is designed for students seeking a background in statistics and/or data science.

Concurrent Degree Program

BA/MA in Mathematics

The Department of Mathematics Concurrent Bachelor's/Master's Program leads to both a BA in Mathematics and either an MA in Mathematics or an MS in Applied Mathematics. It allows highly motivated and successful students to experience graduate-level course work earlier in their education than would otherwise be possible, and also allows them to obtain a master's degree in a reduced time period. Students are allowed to count six hours of graduate-level Mathematics Department course work towards both their undergraduate and graduate degree requirements.

The earliest admission to the program is after the successful completion of at least total 45 credit hours and a minimum of two upper division courses from the Department of Mathematics. Students must have at least one year of coursework remaining towards the completion of their undergraduate degree in order to be admitted to the program. Students admitted to the program may not pursue a double degree or a double major; however, outside minors are allowed.

For more information, see http://www.colorado.edu/math/undergraduate/math_advising/documents/concurrentdegreeguidelines2015.pdf.

Requirements

To earn a BA in mathematics, a student must complete the general requirements of the College of Arts and Sciences, as well as the six mathematics core courses and the five additional courses for one of the five tracks (described below).

Students must earn a grade of C- or better in each of the mathematics core courses and the five additional courses, and have at least a C average for all attempted work in mathematics.

Required Core Courses

The following courses are required of all mathematics majors, regardless of track.

Required Courses

MATH 1300	Calculus 1	4-5
	or MATH 1310 Calculus, Systems, and Modeling	
	or APPM 1350 Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
	or APPM 1360 Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
	or APPM 2350 Calculus 3 for Engineers	
MATH 2001	Introduction to Discrete Mathematics	3
MATH 2135	Introduction to Linear Algebra for Mathematics Majors	3
MATH 3001	Analysis 1	3
Total Credit Hours		21-23

Comprehensive Track

Aimed at students seeking a general background in mathematics or intending to pursue graduate work in mathematics, the comprehensive track requires the following courses:

Required Courses

MATH 3140	Abstract Algebra 1	3
MATH 4140	Abstract Algebra 2	3
	or MATH 4001 Analysis 2	

Electives

Three upper-division MATH or approved APPM courses (at least one at the 4000-level)	9
Total Credit Hours	15

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135, and MATH 3001.
- By the end of the sixth semester, complete MATH 3140, MATH 4140 or MATH 4001, and one additional approved MATH or APPM course.
- By the end of the eighth semester, complete the major.

Applicable Track

Aimed at students seeking a background in applied and/or applicable mathematics, the applicable track requires the following courses:

Required Courses

MATH 4510	Introduction to Probability Theory	3
MATH 3430	Ordinary Differential Equations	3
MATH 4520	Introduction to Mathematical Statistics	3
	or MATH 4470 Partial Differential Equations	

Electives

Two upper-division MATH or approved APPM courses	6
Total Credit Hours	15

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135, and MATH 3001.
- By the end of the sixth semester, complete MATH 4510, MATH 3430, and either MATH 4520 or MATH 4470.
- By the end of the eighth semester, complete the major.

Secondary Education Track

Aimed at students intending to teach mathematics at the secondary level, the secondary education track requires the following courses:

Required Courses

MATH 3110	Introduction to Theory of Numbers	3
or MATH 3140	Abstract Algebra 1	
MATH 3120	Functions and Modeling	3
MATH 3210	Euclidean and Non-Euclidean Geometry	3
MATH 3510	Introduction to Probability and Statistics	3
MATH 4820	History of Mathematical Ideas	3
Total Credit Hours		15

NOTE: Completion of the secondary education track does not provide the student a teaching license.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135, MATH 3001, and MATH 3120.
- By the end of the sixth semester, complete MATH 3510, MATH 3210, and either MATH 3110 or MATH 3140.
- By the end of the eighth semester, complete the major.

Computational Track

Aimed at students interested in both mathematics and computation, the computational track requires the following courses:

Required Courses

CSCI 1300	Computer Science 1: Starting Computing	4
CSCI 2270	Computer Science 2: Data Structures	4
CSCI 3104	Algorithms	4
MATH/APPM 4650	Intermediate Numerical Analysis 1	3

Electives

Three MATH or approved APPM or approved CSCI courses, at least one of which must be at the 4000-level. At most one of these courses may be a computer science course	9
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Total Credit Hours	24
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Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Computer Science 1, Computer Science 2, Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135, and MATH 3001.
- By the end of the sixth semester, complete CSCI 3104, MATH 4650/APPM 4650 and one of the additionally required upper-division MATH classes.
- By the end of the eighth semester, complete the major.

Statistics Track

Aimed at students seeking a background in statistics and/or data science, the statistics track requires the following courses:

Required Courses

MATH 4510	Introduction to Probability Theory	3
MATH 4520	Introduction to Mathematical Statistics	3
MATH 4540	Introduction to Time Series	3

Electives

Two of the following courses: APPM 4580 (Statistical Applications), APPM 4590 (Statistical Modeling), APPM 4560 (Markov Processes), MATH 6550 (Introduction to Stochastic Processes)	6
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Total Credit Hours	15
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Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress," as it is used here, refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in mathematics, students should meet the following requirements.

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete Calculus 1, Calculus 2, Calculus 3, MATH 2001, MATH 2135, and MATH 4510.
- By the end of the sixth semester, complete MATH 3001, MATH 4520, and MATH 4540.
- By the end of the eighth semester, complete the major.

Mathematics - Minor

The undergraduate minor in mathematics emphasizes knowledge and awareness of:

- calculus of several variables and vector analysis;
- the structure of mathematical proofs and definitions;
- basic linear algebra and the theory of vector spaces;
- at least one additional specialized area of mathematics.

Requirements

Declaration of a minor in mathematics is open to any student enrolled at CU Boulder, regardless of college or school.

To earn a minor in mathematics, students must complete the following courses with a grade of C- or better in each course, and they must have at least a C (2.00) average for all attempted work in mathematics.

Required Courses and Semester Credit Hours

Required Courses

MATH 1300	Calculus 1	4-5
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
or APPM 2350	Calculus 3 for Engineers	
MATH 2001	Introduction to Discrete Mathematics	3
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	3
or MATH 2135	Introduction to Linear Algebra for Mathematics Majors	

Electives

Three upper-division MATH courses (at least one at the 4000-level)	9
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Total Credit Hours	27-29
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Medieval and Early Modern Studies

To the Middle Ages, the modern world owes the preservation and transmission of Latin and Greek; the development of a host of vernaculars; the evolution of Judaism and Christianity, and the rise of Islam; the renewed study of Roman law; the growth of a mercantile class; the creation of musical notation; the erection of ecclesiastical monuments; the foundations of constitutional government; and the institution of universities. The early modern period inherited and elaborated all these institutions and inventions, adapting them to fit new conceptions of man (and woman), church, and state.

The Center for Medieval and Early Modern Studies is founded on the convictions that the period from c. 400 to c. 1800, conceived in a global context, is a dynamic cultural continuum and ever-evolving system; that study of both periods in tandem sheds new light on each; and that the unity and diversity of the premodern world can be understood and appreciated only from an interdisciplinary perspective. Medieval and Early Modern Studies therefore crosses boundaries of period, nation, language and discipline, and the center's prime function is to facilitate and encourage interdepartmental study and teaching.

Courses throughout the curriculum are available to students whose area of specialization within a given department is the medieval and/or early modern period(s) and who wish to broaden their knowledge of the cultures of the period. With the approval of the major department, a coherent group of these courses may be accepted as a related program of study and as part of the requirements for an undergraduate degree. For additional details concerning these courses, see departmental listings.

For more information see, <http://www.colorado.edu/cmems/>.

Course code for this program is MEMS.

Certificate

- Medieval and Early Modern Studies - Certificate (p. 428)

MEMS 2020 (3) Introduction to Medieval and Renaissance Studies

Introduces students to the literature, history, culture and art of Europe and the Mediterranean basin from late antiquity through the renaissance. The course is interdisciplinary and focuses on topics which reveal the dynamism and diversity of pre-modern culture.

MEMS 4020 (3) Medieval and Early Modern Studies: Texts and Contexts

Focuses on communities in the Mediterranean basin and Europe (i.e., cloister, court and city), discussing major literary texts and visual monuments associated with them and their historical context.

Emphasizes tensions between tradition and innovation, Latin and vernacular, East and West, Christian and non-Christian (Jewish and Islam), sacred and secular, authority and freedom and male and female.

Equivalent - Duplicate Degree Credit Not Granted: MEMS 5020

Requisites: Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).

MEMS 4030 (3) Medieval and Early Modern Studies: Special Topics

Different topics offered by the faculty of the Medieval and Early Modern Studies Program in alternate semesters. Topics may include the literature of pilgrimage and travel, women and minorities, theatre, music, epic, medieval and early modern views of the classics, the Bible, and medieval and early modern theories of education.

Equivalent - Duplicate Degree Credit Not Granted: MEMS 5030

Requisites: Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).

Medieval and Early Modern Studies - Certificate

Students who pursue the MEMS certificate are free to take a variety of courses offered in numerous departments across the CU Boulder campus. In consultation with the CMEMS Director, each student can tailor the certificate to meet their intellectual interests in the study of premodern Europe and its global influence. Students usually earn the certificate in tandem with a BA degree in history, classics or English and find the analytical and linguistic skills particularly useful for graduate work in history and law.

Requirements

Students must complete at least 24 credit hours of approved course work, as follows.

Required Courses and Semester Credit Hours

Select one of the following lower-division introductory survey courses: 3

ARTH 1300	History of World Art 1
ARTH 1400	History of World Art 2
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600
HUMN 1110	Introduction to Humanities: Literature 1
HUMN 1120	Introduction to Humanities: Literature 2
HUMN 1210	Introduction to Humanities: Art and Music 1
HUMN 1220	Introduction to Humanities: Art and Music 2

Senior-level seminar:

3

MEMS 4030	Medieval and Early Modern Studies: Special Topics (or equivalent) ¹	
Capstone Seminar:		3
MEMS 4020	Medieval and Early Modern Studies: Texts and Contexts (or equivalent) (with a minimum grade of B) ¹	
Five electives, at least four of which must be upper division and two of which must be in disciplines other than the major		15
Total Credit Hours		24

¹ Substitutions for MEMS 4020 and MEMS 4030 may be made at the discretion of the MEMS advisor or faculty chair.

Molecular, Cellular and Developmental Biology

The undergraduate program in MCDB is directed toward understanding the molecular and cellular mechanisms that provide the basis for biological structure, growth, evolution, embryonic development and genetic inheritance. Undergraduate majors learn about the scientific method, experimental approaches and groundbreaking discoveries that have made modern molecular and cellular biology such an important force in medicine, agriculture, and the growing biotechnology industry. They also learn about the diverse tools of modern biology, including recombinant DNA, genomic mapping, transgenic organisms, gene targeting, analysis of mutants, biochemical purification, antibody probes, laser manipulation of living cells, light and electron microscopy, and computer modeling. In addition to academic and laboratory classes, MCDB majors have many opportunities to participate in ongoing research in the department.

Learn how living systems operate at the cellular and molecular levels of organization, their assembly and structure, with heavy emphasis on genetic information and regulation, including embryonic development.

Course code for this program is MCDB.

Animal Use Policy

Biology is the science of life, and a major in it must include some hands-on experience with living organisms to be complete. Exercises involving the use of living animals or animal tissues are included, therefore, in MCDB laboratory courses. Majors with objections on moral grounds may arrange to limit their participation in these exercises, although their educational experience is compromised by doing so.

Nonmajors may take MCD biology lecture courses without the accompanying laboratories. Laboratory courses in which living vertebrate animals or tissues are used are identified in the course description section of this catalog. For additional information, please contact the department.

Bachelor's Degree

- Molecular, Cellular and Developmental Biology - Bachelor of Arts (BA) (p. 436)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lois A.
Professor Emeritus

Anseth, Kristi S (https://experts.colorado.edu/display/fisid_103471)
Distinguished Professor; PhD, University of Colorado Boulder

Betterton, Meredith D (https://experts.colorado.edu/display/fisid_125396)
Associate Professor; PhD, Harvard University

Blumenthal, Thomas (https://experts.colorado.edu/display/fisid_143346)
Professor; PhD, Johns Hopkins University

Boswell, Robert E (https://experts.colorado.edu/display/fisid_100196)
Professor; PhD, University of Colorado Boulder

Cech, Thomas R (https://experts.colorado.edu/display/fisid_103252)
Distinguished Professor; PhD, University of California-Berkeley

Chen, Zhe (https://experts.colorado.edu/display/fisid_148754)
Asst Research Professor; PhD, University of Colorado Boulder

Copley, Shelley (https://experts.colorado.edu/display/fisid_104067)
Professor; PhD, Harvard University

DeDecker, Brian S (https://experts.colorado.edu/display/fisid_143934)
Senior Instructor

Detweiler, Corrella Scott (https://experts.colorado.edu/display/fisid_128240)
Associate Professor; PhD, University of California-San Francisco

Dowell-Deen, Robin DeAnne (https://experts.colorado.edu/display/fisid_147779)
Assistant Professor; DSc, Washington University

Dubin, Mark W.
Professor Emeritus

Fillman, Christy L. (https://experts.colorado.edu/display/fisid_145115)
Instructor; PhD, University of Colorado Boulder

Garcea, Robert L (https://experts.colorado.edu/display/fisid_146103)
Professor; MD, University of California-San Francisco

Gold, Lawrence (https://experts.colorado.edu/display/fisid_100581)
Professor; PhD, University of Connecticut

Han, Min (https://experts.colorado.edu/display/fisid_105512)
Professor; PhD, University of California-Los Angeles

Harvey, Pamela Ann (https://experts.colorado.edu/display/fisid_148012)
Instructor; PhD, Tufts University

Hoenger, Andreas (https://experts.colorado.edu/display/fisid_142883)
Professor; PhD, Univ of Basel (Switzerland)

Jones, Kevin Robert (https://experts.colorado.edu/display/fisid_102094)
Associate Professor; PhD, University of California-Berkeley

Junge, Harald Jobst (https://experts.colorado.edu/display/fisid_148593)
Assistant Professor; PhD, Philipps University Marburg (Germany)

Klymkowsky, Michael W (https://experts.colorado.edu/display/fisid_101226)
Professor; PhD, California Institute of Technology

Knight, Jennifer Kirsten (https://experts.colorado.edu/display/fisid_101933)

Associate Professor; PhD, University of Michigan Ann Arbor

Kralj, Joel M (https://experts.colorado.edu/display/fisid_153055)

Assistant Professor; PhD, Boston University

Krauter, Kenneth S (https://experts.colorado.edu/display/fisid_107978)

Professor; PhD, Yeshiva University

Kuempel, Peter L.

Professor Emeritus

Leinwand, Leslie Anne (https://experts.colorado.edu/display/fisid_107104)

Distinguished Professor; PhD, Yale University

Martin, Jennifer Mary (https://experts.colorado.edu/display/fisid_110125)

Senior Instructor; PhD, University of Washington

McConkey, Edwin H.

Professor Emeritus

McIntosh, J. Richard

Professor Emeritus

Odorizzi, Charles Gregory (https://experts.colorado.edu/display/fisid_118429)

Associate Professor; PhD, University of California-San Diego

Old, William (https://experts.colorado.edu/display/fisid_103039)

Assistant Professor; PhD, University of Colorado Boulder

Olwin, Bradley Bruce (https://experts.colorado.edu/display/fisid_109888)

Professor; PhD, University of Washington

Orth, James D (https://experts.colorado.edu/display/fisid_152017)

Asst Research Professor; PhD, Mayo Graduate School of Medicine

Pace, Norman R.

Professor Emeritus

Park, Soyeon (https://experts.colorado.edu/display/fisid_151944)

Assistant Professor; PhD, Mayo Graduate School of Medicine

Parker, Roy Robert (https://experts.colorado.edu/display/fisid_151440)

Professor; PhD, University of California-San Francisco

Runner, Meredith

Professor Emeritus

Sawyer, Sara Lea (https://experts.colorado.edu/display/fisid_155218)

Associate Professor; PhD, Cornell University

Shen, Jingshi (https://experts.colorado.edu/display/fisid_146414)

Associate Professor; PhD, Columbia University In the City of New York

Singh, Ravinder (https://experts.colorado.edu/display/fisid_112067)

Associate Professor; PhD, Baylor College of Medicine

Staehein, L. Andrew

Professor Emeritus

Stowell, Michael (https://experts.colorado.edu/display/fisid_124136)

Associate Professor; PhD, California Institute of Technology

Su, Tin Tin (https://experts.colorado.edu/display/fisid_113847)

Professor; PhD, Carnegie Mellon University

Sueoka, Noboru

Professor Emeritus

Van Blerkom, Jonathan (https://experts.colorado.edu/display/fisid_100545)

Research Professor; PhD, University of Colorado Boulder

Voeltz, Gia Kaarina (https://experts.colorado.edu/display/fisid_143587)

Associate Professor; PhD, Yale University

Wood, William B. III

Professor Emeritus

Xue, Ding (https://experts.colorado.edu/display/fisid_112336)

Professor; PhD, Columbia University In the City of New York

Yarus, Michael J.

Professor Emeritus

Yi, Rui (https://experts.colorado.edu/display/fisid_146697)

Associate Professor; PhD, Duke University

MCDB 1030 (3) Introduction to Molecular Biology

Introduces the foundation of molecular, cell, developmental and evolutionary biology in the context of human development and disease. Including how the immune system works to protect us from infections and technologies being developed towards the goal of better health around the world. For nonmajors.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MCDB 1041 (3) Fundamentals of Human Genetics

Covers the basic principles of genetics, human pedigree analysis, and how genetic diseases affect DNA, RNA, and proteins. Considers implications of this research for medicine and society. For nonmajors.

Recommended: Requisite good background in high school chemistry and biology.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MCDB 1043 (1) Exploring Genetics Laboratory

Provides hands-on experience with fundamental genetic principles.

Topics include scientific method, experimental design, mitosis, meiosis, classical genetics, molecular genetics, mutagenesis, DNA analysis, and transgenic organisms. Wherever possible, the focus of the lab will be on integrating science process skills with human-relevant experiments to encourage students to learn and apply science skills while seeing the application to humans.

Requisites: Restricted to Biological Sciences (MCDB) non-majors only.

Recommended: Corequisite MCDB 1041.

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 1111 (3) Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology

Web-based, in-class discussion course covering the fundamental properties shaping living systems. Uses evolutionary (including social) and physical-chemical mechanisms to frame molecular, cellular and organismic processes. Interpreting and answering questions scientifically as well as quantitative reasoning skills are stressed. Fulfills the MCDB major's requirement for MCDB 1150.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1150

Additional Information: Arts Sci Core Curr: Natural Science Sequence

MCDB 1150 (3) Introduction to Cellular and Molecular Biology

Covers biologically important macromolecules and biological processes, together with an introduction to cell structure, function, and physiology. Provides the foundation for advanced MCDB courses to majors, and a rigorous overview of modern biology to nonmajors. MCDB 1151 must be taken concurrently by MCDB and biochemistry majors and prehealth science students.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1111

Recommended: Prerequisite high school chemistry and algebra, and recommended corequisites of MCDB 1151 and MCDB 1152.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Natural Science Lab or Lab/Lec

MCDB 1151 (1) Introduction to Cell and Molecular Biology Lab

Offers one two-hour lab per week designed to acquaint students with research techniques and concepts in molecular and cellular biology. Topics include cell structure, function, physiology, and recombinant DNA.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1111

Recommended: Corequisite MCDB 1150 or CHEN 2810 or EBIO 1210.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

MCDB 1152 (1) Problem Solving Co-Seminar for Introduction to Molecular and Cellular Biology

Uses problem solving and other interactive group work to aid student learning in a corequisite course, MCDB 1150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

Recommended: Corequisite MCDB 1150.

Grading Basis: Pass/Fail

MCDB 1161 (2) From Dirt to DNA: Phage Genomics Laboratory I

Provides laboratory experience working on a bacteriophage genomics research project. Students will study novel bacteriophage they isolate from the environment. Topics covered include phage biology, bacteria and phage culturing and amplification, DNA isolation, restriction digest analysis, agarose gel electrophoresis, and electron microscopy.

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 1171 (2) Drug Discovery Through Hands-on Screens I

Provides introductory research and laboratory experience. Students will work in teams to screen small molecule libraries for novel antibiotics using the bacterium *Salmonella* as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

Requisites: Requires corequisite course of MCDB 1150.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 2150 (3) Principles of Genetics

Introduces the behavior of genes and chromosomes in eukaryotic and prokaryotic organisms. Covers three areas: transmission genetics, molecular genetics, and population genetics. Attention is given to genetic mapping, recombinant DNA procedures, and gene expression.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 2222

Recommended: Prerequisite MCDB 1150 or EBIO 1210 or CHEN 2810 (minimum grade C-) and recommended corequisites of MCDB 2151 and MCDB 2152.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MCDB 2151 (1) Principles of Genetics Laboratory

One two-hour lab per week. Provides hands-on experience with principles introduced in MCDB 2150. Topics include mitosis, meiosis, classical genetics, complementation, mutagenesis, DNA replication, natural selection, and evolution.

Recommended: Prerequisites MCDB 1150 and MCDB 1151 (all minimum grade D-), and recommended corequisite of MCDB 2150.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MCDB 2152 (1) Problem Solving Co-Seminars for Genetics

Uses problem solving and other interactive group work to aid student learning in MCDB 2150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

Recommended: Corequisite MCDB 2150.

Grading Basis: Pass/Fail

MCDB 2161 (2) From DNA to Genes, Phage Genomics Laboratory II

Provides laboratory experience working on a bacteriophage isolated during the previous semester. Topics include bioinformatics, genome annotation, open reading frame and RNA identification, BLAST analysis, phylogenetics and submission to a genomic database.

MCDB 2171 (2) Drug Discovery Through Hands-On Screens 2

Provides introductory research and laboratory experience. Students will work in teams to screen molecule libraries using fruit flies as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires a corequisite course of MCDB 2150.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 2222 (3) Core Concepts in Biology II: Genes, Genetics and Phenotypes

Web-based, in-class discussion course focused on the origins of genetic variation and inheritance, genome dynamics and gene expression and their relationship to phenotype(s). Interpreting, explaining and answering questions scientifically as well as quantitative reasoning are stress. Course fulfills the departmental requirement for MCDB 2150.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 2150

Requisites: Requires a prerequisite course of MCDB 1111 or MCDB 1150 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Sequence

MCDB 2840 (1-3) Lower-Division Independent Study

Students with adequate prerequisites should take MCDB 4840.

Repeatable: Repeatable for up to 8.00 total credit hours.

MCDB 3010 (1-2) Undergraduate Teaching in Course-Based Undergraduate Research Experiences

To address the need for more advanced and continued participation in course-based research, MCDB 3010 is designed to train students who have taken MCDB 1171 or MCDB 2171 or MCDB 4202 as teaching assistants. The aim is to enhance the students' experience and responsibilities in course-based research and to prepare them for research and mentorship in a departmental or graduate laboratory.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of MCDB 1171 or MCDB 2171 or MCDB 1161 or MCDB 4202 (minimum grade B).

Grading Basis: Letter Grade

MCDB 3135 (3) Molecular Cell Biology I

Examines the central dogma of biology by discussing the most important molecules in cells (DNA, RNA and protein) and how their synthesis (DNA replication, transcription, RNA processing and translation) is regulated. Incorporated into the discussion is how recombinant DNA techniques are used to discover and dissect cellular processes, how to design and interpret experiments, and understanding the limits of experiments to draw conclusions. These principles are the foundation for subsequent examination of intracellular mechanisms in MCDB 3145.

Requisites: Requires prerequisite courses of MCDB 2150 or EBIO 2070 and CHEM 1113 or CHEM 1400 or CHEN 1211 (all minimum grade C-).

MCDB 3140 (2) Cell Biology Laboratory

One four-hour lab per week. Provides experience with and exposure to modern cell biology laboratory techniques. Topics include microscopy, immunocytochemistry, Western blotting, Southern blotting, and flow cytometry. This course does not use vertebrate animals.

Recommended: Corequisite MCDB 3135 or MCDB 3145.

MCDB 3145 (3) Molecular Cell Biology II

Examines intracellular mechanisms, including transport of ions and small molecules across membranes; protein targeting to organelles; membrane trafficking between organelles; signal transduction; the cytoskeleton; and the cell cycle. Analysis of these activities is from the experimental perspective established in MCDB 3135.

Recommended: Prerequisite MCDB 3135 (minimum grade C-), and recommended prerequisite or corequisite of MCDB 3140 concurrent with either this class or MCDB 3135.

MCDB 3150 (3) Biology of the Cancer Cell

Highlights dimensions of the cancer problem; cancer as a genetic/cellular disease; chemicals, viruses, and radiation as causes of cancer; cancer and diet; cancer epidemiology; cancer risk factors; proto-oncogenes, oncogenes, and cancer suppressor genes; and prevention of cancer.

Recommended: Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

MCDB 3160 (3) Pandemic! How the Genomics Revolution Can Save Us All

Illustrate how cutting edge tools in genomics can be used to study, monitor and cure disease caused by new and re-emerging human pathogens such as SARS/MERS, Ebola virus, Neisseria meningitides, influenza virus and malaria parasites. Technologies covered will include genome sequencing, annotation, transcriptomics, phylogenetics and genotyping of microbial populations. An integrated approach to this topic will be presented, with these concepts threaded throughout: natural history and evolution of pathogens, molecular biology, immunology, epidemiology, public health and clinical diagnosis. There may be some overlap with material covered in MCDB 1030 and MCDB 4750.

Requisites: Requires prerequisite course of MCDB 2150 or EBIO 2070 (minimum grade B-).

Grading Basis: Letter Grade

MCDB 3330 (3) Evolution and Creationism

Intensive lecture/discussion course on the interrelationships among science, religion, and social policy. Includes historical and scientific development of evolution theory, social Darwinism/sociobiology, and the public perception of science.

Recommended: Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

MCDB 3332 (1) Scientific Ethics

A reading/discussion course on the implications of modern biologically-based technologies, from in vitro fertilization and its variants and issues surrounding these techniques, to genomic testing of embryos and adults, the genetic engineering of organisms, including humans, to issues surrounding communicable diseases and vaccination. Discussion will include a serious consideration of various philosophical and non-scientific perspectives.

Requisites: Requires prerequisite course of MCDB 1150 or EBIO 1210 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

MCDB 3333 (3) Biomedical Innovations and Discoveries

Discusses how biological inventions and discoveries fuel biomedical innovations, how important techniques in molecular biology have advanced our understanding of cellular processes and contributed to biotechnology revolution and biomedical sciences to benefit our society. Guest lectures from experts in industry and site visits will enhance the course by providing a non-academic perspective, networking opportunities, and unexpected avenues for career paths for our graduates. Department enforced prerequisite: MCDB 2150 or EBIO 2070 or instructor consent.

Grading Basis: Letter Grade

MCDB 3350 (3) Fertility, Sterility, and Early Mammalian Development

Describes the production of germ cells, ovulation, fertilization, reproductive cycles, controls of reproduction, early development of the embryo, methods of contraception, and causes and treatments of sterility. Recommended for students planning careers in the health sciences.

Recommended: Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

MCDB 3501 (3) Structural Methods for Biological Macromolecules

Teaches fundamental knowledge about protein structures, protein interactions and protein folding. Discusses in detail the most common methods on how proteins and macromolecular complexes are studied, such as X-ray crystallography, NMR-spectroscopy and electron microscopy. Offers about 50 percent direct teaching, 40 percent discussion of papers in a journal club style and 10 percent hands-on practicals on software packages relevant to structural biology. Formerly MCDB 4501.

Recommended: Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

MCDB 3650 (3) The Brain - From Molecules to Behavior

Examines the molecular basis of the brain's role in thought, action, and consciousness by exploring issues such as relationship of cognition and localized brain function, sensory systems and their role in cognition, learning and memory, and behavioral neurochemistry.

Recommended: Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

MCDB 3651 (3) The Brain: Dysfunction to Disease

Misregulation of synaptic function results in abnormal brain function and behavior that is manifested in numerous neurological and psychiatric diseases. Explores the molecular mechanisms responsible for altered synaptic plasticity in neurological diseases such as frontotemporal dementia (FTD), Parkinson's disease, Huntington's disease, Creutzfeldt-Jakob disease, Down syndrome, epilepsy, autism, and Alzheimer's disease.

Recommended: Prerequisites MCDB 3650 or NRSC 2100 (minimum grade C-) or instructor consent required.

Grading Basis: Letter Grade

MCDB 3700 (3) Poisons in Cell Biology and Society

Investigate the inner workings of our cells by studying how poisons disrupt these processes. We will learn how selected poisons affect critical processes inside the cell to cause death or destruction. The scientific aspects of the poison will be discussed in the context of its historical significance or impact on society and popular culture. Department enforced prerequisites: MCDB 1150 or EBIO 1210 and MCDB 2150.

MCDB 3990 (3) Introduction to Systems Biology for Biologists

Introduces majors with relatively little mathematical experience to the major concepts in systems biology, in the context of key processes (cell growth, division, adaptation, development, and disease). Designed to help students master the necessary mathematical tools involved.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and MATH 1310 (minimum grade C-).

Grading Basis: Letter Grade

MCDB 4100 (1-6) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4111 (3) Experimental Design and Research in Cell and Molecular Biology

Learning molecular and cell biology experimental design and approaches through independent research projects. Students, working in pairs, will explore the research process and gain extensive first-hand experience in: hypothesis formation; experimental design; solution preparation and experimental methodology; proposal presentation and defense (oral and written); formal presentation of results and conclusions (oral and written in a publication-style format); the publication process; critical reading and evaluation of primary scientific literature.

Recommended: Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-) and recommended corequisite of MCDB 3135.

MCDB 4201 (3) From Bench to Bedside: The Role of Science in Medicine

Demonstrates the breadth of research in the life sciences and how such research (not just in medical schools) can lead to medical applications. Lecturers from life sciences, the medical school and biotechnology, discuss drug development and the transfer of research into the clinical arena. Students also prepare a paper and presentation on the development of a commercial drug.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4202 (3) The Python Project

Studies how python hearts grow after they consume a meal.

Understanding the molecular processes of growth and regression in the python heart could lead to development of therapeutics for heart disease. Students work in groups in the laboratory and generate novel data by using modern molecular biology and bioinformatic techniques to clone and sequence candidate molecules of the python genome. May be repeated once.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4234 (3) Research Methods

Presents a rigorous and pedagogically coherent introduction into the experimental process used to collect data, formulate hypotheses, and answer scientific questions in general, and biological questions in particular. Includes a detailed consideration of the elements of experimental design, data collection and analysis, and the interpretation of results in the context of effective science teaching. Part of the CU Teach course sequence for teacher certification in science and mathematics.

Requisites: Restricted to Biological Sciences (MCDB) majors or School of Education (EDUC) undergraduate students only.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4300 (3) Immunology

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5301

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4310 (3) Microbial Genetics and Physiology

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5310

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) and recommended corequisite of CHEM 4611.

MCDB 4312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5312

Grading Basis: Letter Grade

MCDB 4350 (3) Microbial Diversity and the Biosphere

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5350

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and CHEM 1133 and EBIO 3400 and/or CHEM 3311 (minimum grade C-).

MCDB 4361 (3) Evolution and Development

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development). Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5361

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4410 (3) Human Molecular Genetics

Studies the human organism as a genetic system, including effect of mutation on protein structure and function, biochemical basis of human genetic disease, polymorphic gene loci, gene mapping and identification, gene cloning and characterization, and impact of human genetics on medicine and society. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisite MCDB 3135 (minimum grade C-).

MCDB 4422 (3) Molecular Biology of Free Radicals: Role(s) in Oxidative Stress, Signaling, Disease, Aging

Examines how free radicals are formed in biological systems and their roles in oxidative stress, cell signalling, aging, and disease. Emphasis will be placed on the recent literature. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and CHEM 3311 (minimum grade C-).

MCDB 4425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5425

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

MCDB 4426 (3) Cell Signaling and Developmental Regulation

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5426

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and CHEM 4700 (minimum grade C-).

MCDB 4427 (3) Biology of the Visual System

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5427

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

MCDB 4441 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5441 and EBIO 4440 and EBIO 5440

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

MCDB 4444 (3) Cellular Basis of Disease

Explores the cellular basis of disease. Discusses diseases arising from defects in intracellular targeting, cytoskeletal function, intracellular signaling, genomic instability, gene regulation, cell proliferation, and cell death. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4471 (3) Mechanisms of Gene Regulation in Eukaryotes

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5471

Recommended: Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

MCDB 4520 (3) Bioinformatics and Genomics

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5520

Recommended: Prerequisites MCDB 3135 or CHEM 4700 (minimum grade C-).

MCDB 4521 (1) Bioinformatics and Genomics Laboratory

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5521

Grading Basis: Letter Grade

MCDB 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5550 and PHYS 4550 and PHYS 5550

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 and MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

MCDB 4560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5560 and PHYS 4560 and PHYS 5560

Requisites: Requires a prerequisites course of PHYS 2210 (minimum grade C-).

Recommended: Prerequisite PHYS 4230.

Grading Basis: Letter Grade

MCDB 4615 (3) Biology of Stem Cells

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5615

Recommended: Prerequisite MCDB 3135 or MCDB 3145 or instructor consent required.

MCDB 4621 (3) Genome Databases: Mining and Management

Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4621 or CHEM 5621 MCDB 5621

Recommended: Prerequisite MCDB 3135 or CSCI 3104 or CHEM 4700 and recommended corequisite of CSCI 2270.

MCDB 4650 (3) Developmental Biology

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5651

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4680 (3) Mechanisms of Aging

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5680

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4750 (3) Animal Virology

Encompasses the structure and replication of both lytic and transforming animal viruses. Emphasizes diversity of naturally occurring genomic structures and the resulting strategies of infection as well as the impact of viral epidemics on society. Includes critical analysis of primary research papers. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

MCDB 4777 (3) Molecular Neurobiology

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5777

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4790 (3) Experimental Embryology

Embryology is studied by considering experiments relevant to specific topics of early animal development. Emphasizes reading, interpretation, and discussion of research articles.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4810 (3) Insane in the Membrane: The Biology and Biophysics of the Membrane

Studies the biology and physics of the biomembrane. Topics include structure and mechanism of membrane proteins; membrane biogenesis; membrane protein folding and stability; membrane homeostasis; mechanisms of membrane fusion and fission; lipid trafficking. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisite CHEM 4700 (minimum grade C-) or instructor consent required.

MCDB 4811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5811 and EDUC 4811 and EDUC 6811

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 and MCDB 3145.

MCDB 4840 (1-6) Upper-Division Independent Study

An independent study contract is required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite MCDB 2150.

MCDB 4980 (3) Honors Research

Provides faculty-supervised research for students who have been approved by the departmental honors committee. Normally taken during the semester before completion of the honors thesis.

Recommended: Prerequisite MCDB 4840 or comparable research experience, and minimum GPA of 3.20.

Additional Information: Arts Sciences Honors Course

MCDB 4990 (3) Honors Thesis

Involves the preparation and defense of an honors thesis, based on faculty-supervised original research, including final phases of the research project.

Recommended: Prerequisites MCDB 4840 or MCDB 4980 or comparable research experience, and minimum GPA of 3.3 and approval by the MCDB Honors Committee.

Additional Information: Arts Sciences Honors Course

Molecular, Cellular and Developmental Biology - Bachelor of Arts (BA)

The undergraduate degree in molecular, cellular and developmental biology emphasizes knowledge and awareness of:

- the biological sciences in general and a detailed understanding of currently important aspects of cellular biology, molecular biology, biochemistry, genetics and developmental biology; and
- the relationship of the specialty area to broader areas of science and to society in general, including ethical issues raised by current biological research and by the rapid growth of biotechnology as an important shaping force for the future.

In addition, students completing the degree in molecular, cellular and developmental biology are expected to acquire the ability and skills to:

- learn detailed laboratory procedures rapidly when the need arises;
- demonstrate a scientific vocabulary and an understanding of research methods that permits the comprehension of current journal articles, extraction of pertinent information and judgment of the quality of the work described;
- evaluate a biological problem, determine which aspects are understood and apply basic research methods and techniques to the unknown aspects; and

- communicate scientific concepts and analytical arguments clearly and concisely, both orally and in writing.

Requirements

Prerequisites

It is MCDB policy to enforce the course prerequisites listed in the course catalog. If you have not either taken and passed (C- or better) the prerequisites for a course, or obtained permission from the instructor or a departmental advisor to take the course based on equivalent preparatory course work or experience here or elsewhere, you may be administratively dropped from the course.

Course Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. All required courses must be completed with a grade of C- or better.

It is strongly recommended that MCDB majors consult with a departmental advisor before applying AP, IB or CLEP credit. Students majoring in MCDB who transfer biology credit from other institutions also must consult a departmental advisor.

Students who plan to double major with biochemistry or chemistry are encouraged to meet with an academic advisor to understand how their chemistry courses will apply to the MCDB major.

Students who plan to also pursue a degree in engineering are encouraged to meet with an academic advisor to understand how their chemistry and calculus courses will apply to the MCDB major.

Required Courses and Credit Hours

Required Courses

MCDB 1150	Introduction to Cellular and Molecular Biology (MCDB 1152 is a recommended coseminar for MCDB 1150) ¹	3
MCDB 2150	Principles of Genetics (MCDB 2152 is a recommended coseminar for MCDB 2150) ²	3
Choose on of the following research-based introductory labs		2
MCDB 1161	From Dirt to DNA: Phage Genomics Laboratory I	
MCDB 1171	Drug Discovery Through Hands-on Screens I	
MCDB 2171	Drug Discovery Through Hands-On Screens 2	
MCDB 3135	Molecular Cell Biology I	3
MCDB 3140	Cell Biology Laboratory	2
MCDB 3145	Molecular Cell Biology II	3

Upper division capstone and scientific reasoning requirements:

Select one of the following MCDB Capstone courses:		3
MCDB 4650	Developmental Biology	
MCDB 4300	Immunology	
MCDB 4777	Molecular Neurobiology	
Select one MCDB scientific reasoning course (see department for full list of approved courses)		3
MCDB 4350	Microbial Diversity and the Biosphere	
MCDB 4361	Evolution and Development	
MCDB 4410	Human Molecular Genetics	
MCDB 4422	Molecular Biology of Free Radicals: Role(s) in Oxidative Stress, Signaling, Disease, Aging	
MCDB 4425	Topics in Membrane Biology: Cell Biology, Physiology and Disease	

MCDB 4426	Cell Signaling and Developmental Regulation
MCDB 4427	Biology of the Visual System
MCDB 4444	Cellular Basis of Disease
MCDB 4471	Mechanisms of Gene Regulation in Eukaryotes
MCDB 4550	Cells, Molecules and Tissues: A Biophysical Approach
MCDB 4615	Biology of Stem Cells
MCDB 4680	Mechanisms of Aging
MCDB 4750	Animal Virology
MCDB 4790	Experimental Embryology
MCDB 4810	Insane in the Membrane: The Biology and Biophysics of the Membrane
MCDB 4811	Teaching and Learning Biology

Electives

An additional 8 credit hours of MCDB upper-division electives (see department for approved courses)³ 8

Required Ancillary Courses:

Complete the following chemistry courses: 18-20

CHEM 1113 General Chemistry 1
& CHEM 1114 and Laboratory in General Chemistry 1

CHEM 1133 General Chemistry 2
& CHEM 1134 and Laboratory in General Chemistry 2

CHEM 3311 Organic Chemistry 1
& CHEM 3321 and Laboratory in Organic Chemistry 1

CHEM 4611 Survey of Biochemistry

Select one of the following physics sequences: 9-10

PHYS 1110 General Physics 1
& PHYS 1120 and General Physics 2 (including PHYS 1140 lab)⁴

PHYS 2010 General Physics 1
& PHYS 2020 and General Physics 2⁴

Select one of the following calculus or statistics courses: 3-5

Calculus:

MATH 1300 Calculus 1

MATH 1310 Calculus, Systems, and Modeling

APPM 1350 Calculus 1 for Engineers

Statistics:

MATH 2510 Introduction to Statistics

EBIO 1010 Introduction to Quantitative Thinking for Biologists

IPHY 2800 Introduction to Statistics

PSYC 2111 Psychological Science I: Statistics

Total Credit Hours 60-65

¹ EBIO 1210 is an acceptable alternative to MCDB 1150.

² EBIO 2070 is accepted in place of MCDB 2150.

³ Up to 6 hours of MCDB 4840 Upper-Division Independent Study, MCDB 4980 Honors Research, MCDB 4990 Honors Thesis, or select courses from outside MCDB may be used. See department for details.

⁴ PHYS 2010 and 2020 are algebra based. PHYS 1110, 1120 and 1140 are calculus-based and require calculus 1 and 2.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a

requirement for the major. To maintain adequate progress in molecular, cellular and developmental biology, students should meet the following requirements:

- In the first semester, declare the MCDB major.*
- During the first and second semesters, complete either general chemistry or the introductory MCDB sequence.
- By the end of the fourth semester, complete general chemistry and the introductory MCDB sequence with a C- or better.
- By the end of the eighth semester, complete the major.

*If the major is not started in the first year, the student must meet with an MCDB academic advisor to ensure that it is still possible to complete the major in 4 years.

Peace and Conflict Studies

Peace and Conflict Studies (PACS) is an interdisciplinary field, focused on advancing our understanding of conflict dynamics and improving our ability to wisely, equitably, and efficiently handle conflict.

The program empowers students by teaching them sophisticated advocacy, collaboration and peace-building skills that are essential to solving today's big problems.

PACS offers an individually tailored program of study that provides students with:

- the ability to more constructively handle conflict in family, workplace, and community settings,
- a foundation for peace-and conflict-related careers, and
- a better understanding of public policy controversies.

Course code for this program is PACS.

Certificate

- Peace and Conflict Studies - Certificate (p. 438)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Castel, Alison Rebecca (https://experts.colorado.edu/display/fid_158167)

Instructor; MS, University of Pennsylvania

Taylor, Bryan Copeland (https://experts.colorado.edu/display/fid_107421)

PhD, University of Utah

PACS 2500 (3) Introduction to Peace, Conflict and Security Studies

Introduces the related fields of peace, conflict and security studies. Examines causes and dynamics of conflict and violence (interpersonal to global). Examines theory and research concerning peace movements, conflict resolution and security institutions. Explores career options in related fields.

Grading Basis: Letter Grade

PACS 3700 (3) Communication and Conflict Management

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

Equivalent - Duplicate Degree Credit Not Granted: COMM 3700

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

PACS 3800 (3) Security Studies

Provides an introduction to the academic field of "Security Studies".

Focuses on motives, institutions and processes associated with societal defense against threats posed to cherished possessions and the pursuit of stable, autonomous and prosperous existence. Reviews related theoretical traditions associated with militarism, war and conflict.

Covers key concerns of (in-)security in post 9/11 global society, including surveillance, terrorism, genocide and insurgency.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3123

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

PACS 4500 (3) Senior Seminar in Peace, Conflict and Security Studies

Uses theoretical perspectives in peace, conflict and security studies to conduct in-depth research projects, using a case-study approach. Emphasizes use the critical thinking skills in writing, presentations and class discussion. Case study examples include: U.S. militarism, humanitarian intervention in genocide and environmental conflict resolution.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of PACS 2500 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

Grading Basis: Letter Grade

Peace and Conflict Studies - Certificate

The Certificate Program in Peace, Conflict and Security Studies (PACS) is designed to help students explore why conflict and violence occur, and learn how conflict can be managed and transformed to accomplish constructive ends. The certificate is granted by the College of Arts and Sciences, but students in any school or major at the University of Colorado Boulder may earn it.

The program develops an interdisciplinary perspective on the study of conflict, cooperation, war, and peace. Coursework focuses on theorizing and analyzing various forms of intra- and international conflict, and also related possibilities for personal and social change. Coursework also emphasizes development of practical skills and experience in conflict resolution and civic activism. The program encourages hands-on, "in the field" engagement through volunteer service, enrollment in study-abroad programs, and internship placement with related agencies and programs.

For more information or an application, visit the Peace and Conflict Studies Program (<http://www.colorado.edu/pacs>) website.

Course code for this program is PACS.

Requirements

Completion of the certification requires 24 credit hours (15 upper-division) of study, including:

Required Courses and Semester Credit Hours

Required Courses

PACS 2500	Introduction to Peace, Conflict and Security Studies	3
PACS 4500	Senior Seminar in Peace, Conflict and Security Studies	3

Electives

9 credit hours of relevant course work in the student's major	9
9 credit hours of relevant course work outside the major	9

Additional, optional PACS courses listed below:

PACS 3700	Communication and Conflict Management
PACS 3800	Security Studies

Total Credit Hours	24
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Philosophy

Philosophy provides an essential component in any sound general education – that form of education designed, not to prepare one for a specific career, but to give one a broad and general understanding of the world, the place of human beings in the world, and human values, as well as general intellectual skills that can be brought to bear on diverse subject matters.

Course code for this program is PHIL.

Bachelor's Degree

- Philosophy - Bachelor of Arts (BA) (p. 444)

Minor

- Philosophy - Minor (p. 446)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bailey, Dominic T. J. (https://experts.colorado.edu/display/fisid_145110)
Associate Professor; PhD, University of Cambridge (England)

Boonin, David Isaac (https://experts.colorado.edu/display/fisid_113100)
Professor; PhD, University of Pittsburgh

Boonin, Leonard
Professor Emeritus

Bredeson, Garrett Zantow (https://experts.colorado.edu/display/fisid_154933)
Instructor

Chapman, Andrew David (https://experts.colorado.edu/display/fisid_153016)
Lecturer

Cleland, Carol (https://experts.colorado.edu/display/fisid_105674)
Professor; PhD, Brown University

Fileva, Iskra Nikova (https://experts.colorado.edu/display/fisid_154600)
Assistant Professor; PhD, Boston University

Fisher, John
Professor Emeritus

Forbes, Graeme R (https://experts.colorado.edu/display/fisid_143615)
Professor; DPhil, Oxford Univ (England)

Hale, Benjamin Slater (https://experts.colorado.edu/display/fisid_141456)
Associate Professor; PhD, SUNY at Stony Brook

Heathwood, Christopher Charles (https://experts.colorado.edu/display/fisid_141144)
Associate Professor; PhD, University of Massachusetts at Amherst

Hosein, Adam Omar (https://experts.colorado.edu/display/fisid_147427)
Assistant Professor; PhD, Massachusetts Institute of Technology

Huemer, Michael (https://experts.colorado.edu/display/fisid_113081)
Professor; PhD, Rutgers University Newark Campus

Jaggar, Alison M (https://experts.colorado.edu/display/fisid_100454)
Professor; PhD, SUNY at Buffalo

Kaufman, Daniel Patrick (https://experts.colorado.edu/display/fisid_134174)
Associate Professor; PhD, University of Massachusetts at Amherst

Lee, Mi-Kyoung (https://experts.colorado.edu/display/fisid_141821)
Associate Professor; PhD, Harvard University

Miller, Ed
Professor Emeritus

Mills, Claudia
Professor Emeritus

Morrison, Wes
Professor Emeritus

Norcross, Alastair J. (https://experts.colorado.edu/display/fisid_144850)
Associate Professor; PhD, Syracuse University

Oddie, Graham James (https://experts.colorado.edu/display/fisid_104741)
Professor; PhD, University of London (England)

Pasnau, Robert C (https://experts.colorado.edu/display/fisid_115293)
Professor; PhD, Cornell University

Potter, Jason Timothy (https://experts.colorado.edu/display/fisid_103972)
Instructor

Rupert, Robert D (https://experts.colorado.edu/display/fisid_139802)
Professor; PhD, University of Illinois at Chicago

Saucedo Ceballos, Raul (https://experts.colorado.edu/display/fisid_153759)
Assistant Professor; PhD, Cornell University

Sturgis, Daniel (https://experts.colorado.edu/display/fisid_111794)
Senior Instructor/Instructor; PhD, University of Colorado Boulder

Tooley, Michael (https://experts.colorado.edu/display/fisid_100932)
Professor; PhD, Princeton University

Wingo, Ajume H (https://experts.colorado.edu/display/fisid_144391)
Associate Professor; PhD, University of Wisconsin-Madison

Youkey, David A (https://experts.colorado.edu/display/fisid_105211)
Instructor; PhD, University of Colorado Boulder

Zimmerman, Michael
Professor Emeritus; PhD, Tulane University

PHIL 1000 (3) Introduction to Philosophy

Introduces students to the most fundamental questions of human existence, either typically or through various major figures in philosophy. Topics many include free will, the mind-body problem, the nature of the self, the existence of God, knowledge of the external world, the nature of morality, the meaning of life.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking
Arts Sci Core Curr: Ideals and Values

PHIL 1010 (3) Introduction to Western Philosophy: Ancient

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. PHIL 1010 and PHIL 1020 may be taken in either order.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1030

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking
Arts Sci Core Curr: Historical Context

PHIL 1020 (3) Introduction to Western Philosophy: Modern

Introduces several philosophical texts and doctrines of 17th and 18th century Europe. Gives special attention to the connection between philosophical ideas and the wider historical milieu: social, political and literary. PHIL 1010 and PHIL 1020 may be taken in either order.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking
Arts Sci Core Curr: Historical Context

PHIL 1100 (3) Ethics

Introductory study of major philosophies on the nature of the good for humanity, principles of evaluation, and moral choice as they apply to contemporary moral problems.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking
Arts Sci Core Curr: Ideals and Values

PHIL 1160 (3) Introduction to Bioethics

Introduce students to topics in contemporary bioethics. No previous knowledge of science, philosophy, or bioethics will be presupposed. A primary goal will be to teach students how to think critically and write persuasively.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 1200 (3) Contemporary Social Problems

Examines competing positions in debates over a wide variety of controversial moral, social and political issues. Topics may include: abortion, world poverty, animal rights, immigration, physician-assisted suicide, freedom of religion, hate speech, cloning, income inequality, pornography, gun rights, racial profiling, capital punishment, overpopulation, prostitution, drug legalization, torture.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

MAPS Course: Social Science

PHIL 1400 (3) Philosophy and the Sciences

Considers philosophical topics and concepts related to the natural sciences, such as the following: science and pseudo-science; scientific method; the nature of explanation, theory, confirmation, and falsification; the effect of science on basic concepts like mind, freedom, time, and causality; ethics of experimentation; and the relation of science to society.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Natural Science Non-Sequence

PHIL 1440 (3) Critical Thinking

Introductory study of definition, informal fallacies and the principles and standards of correct reasoning. Provides practice in analyzing, evaluating and constructing frequently encountered types of arguments. Does not fulfill major requirement in logic.

PHIL 1500 (3) Reading, Writing and Reasoning

Teaches students how to write argumentative papers. Each seminar will focus narrowly on some controversial topic. For example, one seminar might focus on the existence of God, whereas another might question whether we have free will. In all cases, a significant portion of the course will be devoted to learning how to write cogent argumentative papers about controversial topics.

Additional Information: Arts Sci Core Curr: Written Communication

PHIL 1600 (3) Philosophy and Religion

Philosophical introduction to some of the central concepts and beliefs of religious traditions, focusing particularly on the question of the existence of God and on the relation between religious beliefs and moral beliefs.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

PHIL 1700 (3) Philosophy and the Arts

Considers philosophic questions involved in the analysis and assessment of artistic experiences and of the objects with which the arts, including the literary arts, are concerned.

PHIL 1750 (3) Philosophy through Literature

Introduces philosophy through literature. Selected novels, plays, and short stories that exemplify traditional problems in philosophy are read and discussed.

PHIL 1800 (3) Open Topics/Philosophy

Repeatable: Repeatable for up to 6.00 total credit hours.

PHIL 2140 (3) Environmental Justice

Traditional and contemporary theories of justice are employed in order to critically analyze social and political issues that have important environmental dimensions. Assesses the relationship of justice and equity to the presuppositions of national and global environmental issues and policies.

PHIL 2150 (3) Ethics and Sex

Explores a variety of moral questions relating to sex and procreation. Topics may include arguments for and against the wrongness of masturbation, homosexuality, transgenderism, incest, pedophilia, bestiality, necrophilia, voyeurism, pornography, sadomasochism, prostitution, abortion, commercial surrogacy and cloning, as well as arguments addressing such additional subjects as what constitutes rape and whether procreation is morally obligatory, optional, or forbidden.

PHIL 2200 (3) Major Social Theories

Introductory study of major philosophies of the past in relation to political, economic, and social issues.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 2220 (3) Philosophy and Law

Considers philosophical issues related to law in general and the U.S. system in particular. Topics to be covered may address such questions as the following: What is the nature of law? What kinds of acts should the law prohibit (e.g., abortion, drug use, pornography, cloning)? Is there a moral obligation to obey the law? Can civil disobedience be justified? Is there a justification for punishing people for breaking the law? Is capital punishment, in particular, morally justified?

Additional Information: Arts Sci Core Curr: United States Context

PHIL 2260 (3) Philosophy and Food

Introduces students to topics and issues connected to the nature of food. Helps students investigate questions about our food choices, production and distribution, as well as connection food bears to culture and identity. No previous experience in philosophy required or presupposed.

PHIL 2270 (3) Philosophy and Race

Explores the historical relationship between western philosophy and race and investigates the ways in which philosophy can be used to address contemporary racial issues.

Additional Information: Arts Sci Core Curr: Human Diversity

PHIL 2290 (3) Philosophy and Women

Explores different approaches to the study of women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2290

Additional Information: Arts Sci Core Curr: Human Diversity

PHIL 2390 (3) Philosophy and Psychology

Interdisciplinary course on issues where philosophy and psychology meet. For example, topics such as selfhood, motivation, psychotherapy, freedom, and human behavior are examined. Selected readings in philosophy and psychology are required.

PHIL 2440 (3) Symbolic Logic

Introduces students to sentential logic, the logic of quantification and some of the basic concepts and results of metalogic (interpretations, validity and soundness).

PHIL 2750 (3) Philosophy and Science Fiction

Explores philosophical issues in science fiction literature and film. Topics may include time travel, artificial intelligence, free will, personal identity, and how scientific advances will change human life and society. Students may read science fiction stories and philosophical articles, and watch several movies.

PHIL 2800 (3) Open Topics/Philosophy

Repeatable: Repeatable for up to 6.00 total credit hours.

PHIL 2840 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3000 (3) History of Ancient Philosophy

Survey of selected figures in ancient Greek and Roman philosophy and in medieval philosophy. Philosophers studied may include the pre-Socratics, Plato, Aristotle, the Hellenistic philosophers and such figures as Aquinas and Occam. Explores the larger cultural context that influenced these philosophers and were, in turn, influenced by them. Department enforced prerequisite: 6 hours of philosophy coursework.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context

PHIL 3010 (3) History of Modern Philosophy

Introduces modern philosophy, focusing on the period from Descartes through Kant. In addition to careful analysis of philosophical arguments, attention is paid to the ways in which philosophers responded to and participated in major developments in the 17th and 18th century, such as the scientific revolution. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context

PHIL 3100 (3) Ethical Theory

Examines important doctrines and arguments in various areas of theoretical ethics, such as the normative ethics of behavior, axiology, virtue theory and metaethics.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 6 hours of philosophy course work.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3110 (3) Feminist Practical Ethics

Explores a variety of personal and public policy issues in the light of the basic feminist commitment to opposing women's subordination. Provides a sense of how a principled commitment to feminism may influence or be influenced by prevailing interpretation of contemporary ideals and values, and gives an opportunity for developing skills of critical analysis.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PHIL 2290 or WGST 2000 or WGST 2290.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3140 (3) Environmental Ethics

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3140

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PHIL 1100 or PHIL 1200 or PHIL 2200 or PHIL 3100 or PHIL 3200.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3160 (3) Bioethics

Analysis of ethical problems involved in such issues as abortion, euthanasia, organ transplants, eugenics, treatment of the patient as a person and the institutional nature of the health care delivery system. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3180 (3) Critical Thinking: Contemporary Topics

Looks at a selected topic such as nuclear disarmament, racial and sexual discrimination, animal rights, or abortion and euthanasia by examining issues through the lens of critical philosophical analysis. Reviews the reasoning behind espoused positions and the logical connections and argument forms they contain. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3190 (3-4) War and Morality

Focuses on moral issues raised by war as a human institution. What are the justifications, limits and alternatives? Does the advent of nuclear weapons change the nature of war? Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3200 (3) Social and Political Philosophy

Systematic discussion and analysis of such philosophic ideas as community, freedom, political power, and violence.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite 6 hours of philosophy course work.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3260 (3) Philosophy and the International Order

Considers philosophical topics concerning the international economic, political and legal systems. Topics that may be considered include the nature of international law, war and peace, humanitarian intervention, international justice, world hunger and human rights. Department enforced prerequisite: 6 hours philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3310 (3) Cognitive Science

An interdisciplinary introduction to cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and LING 3005 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

PHIL 3410 (3) History of Science: Ancients to Newton

Surveys the history of science up to Newton, including the emergence of scientific modes of thinking from religious and philosophical roots in the Near East and Greece to the development of these modes in the Middle Ages and Renaissance. Culminates with Isaac Newton and the 17th century scientific revolution. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context
Arts Sci Core Curr: Natural Science Non-Sequence

PHIL 3430 (3) History of Science: Newton to Einstein

History of physical and biological science, from the epoch-making achievements of Charles Darwin in biology to the dawn of the 20th century revolutions in physics, chemistry and genetics. Deals with the success of the mechanical philosophy of nature and its problems. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context
Arts Sci Core Curr: Natural Science Non-Sequence

PHIL 3480 (3) Critical Thinking/Writing in Philosophy

Focuses upon the fundamental skills, methods, concepts and distinctions that are essential for the study of philosophy. Basic skills covered include the writing of philosophy papers, the reading of articles and the extraction and evaluation of arguments.

Requisites: Requires a prerequisite or corequisite course of PHIL 1440 or PHIL 2440 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Philosophy (PHIL) majors only (excluding minors).

Recommended: Prerequisites 6 hours of philosophy course work.
Additional Information: Arts Sci Core Curr: Written Communication

PHIL 3600 (3) Philosophy of Religion

Philosophical discussion of fundamental issues in religion, such as existence of God, religious experience, faith and reason, evil, immortality and religious language. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3700 (3) Aesthetic Theory

Introduces major theories of aesthetics and contemporary discussions of problems, such as the nature of art and the problem of evaluations in art. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3800 (3) Open Topics in Philosophy

See current departmental announcements for specific content. Department enforced prerequisite: 6 hours of philosophy course work.

Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3840 (1-3) Independent Study

Department enforced prerequisite: 6 hours of philosophy course work.
Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 3930 (1-6) Internship in Social Policy

Under the guidance of an official in a governmental or non-governmental organization, students are assigned to projects selected for their academic suitability as well as for value to the sponsoring organization. Prior approval of department required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites PHIL 1200 and PHIL 2200 and PHIL 3200 and 9 hours in moral or political philosophy course work.

PHIL 4010 (3) Single Philosopher

Intensively studies the work of one historical figure in philosophy, with the aim of reaching a broad understanding of the philosopher's whole body of thought. Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5010

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4020 (3) Topics in the History of Philosophy

Examines a specific philosophical problem over an extended historical period.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites 12 hours of philosophy course work including PHIL 3000 and PHIL 3010.

PHIL 4030 (3) Medieval Philosophy

Introduces philosophy from the late Roman era to the 14th century. Philosophers studied may include Augustine, Boethius, Aquinas, and Ockham. Topics range over religion, ethics, mind, and metaphysics.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4040 (3) Studies in 20th Century Philosophy

Studies two or three major philosophies prominent during the last century.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4070 (3) Existentialist Philosophy

Examines central figures and texts in the existential tradition, from Kierkegaard and Nietzsche to Heidegger and Sartre.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4110 (3) Contemporary Moral Theory

Provides an in-depth look at some recent work in moral theory. Topics covered, varying from year to year, include: consequentialism and its critics; virtue theory; moral psychology; impartiality and the personal point of view.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites PHIL 3100 and 12 hours philosophy course work.

PHIL 4120 (3) Philosophy and Animals

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5120

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PHIL 3100 and 12 hours philosophy course work.

PHIL 4200 (3) Contemporary Political Philosophy

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of PHIL 2200 and PHIL 3200 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours of philosophy course work.

PHIL 4210 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4041 and CLAS 5041 and HIST 4041

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1061 or HIST 1011 or HIST 1051 or HIST 1061 or PSCI 2004 or PHIL 3000.

PHIL 4250 (3) Marxism

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4251

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours of GRMN or PHIL course work or instructor consent.

PHIL 4260 (3) Philosophy of Law

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5260

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4300 (3) Philosophy of Mind

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5300

Requisites: Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 and PHIL 4340 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 4340 (3) Epistemology

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

Equivalent - Duplicate Degree Credit Not Granted: 5340

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

Recommended: Prerequisites PHIL 3480 and 12 credit hours of philosophy including PHIL 2440 and PHIL 3010.

PHIL 4360 (3) Metaphysics

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5360

Requisites: Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 and PHIL 4340 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 4370 (3) Free Will and Determinism

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5370

PHIL 4400 (3) Philosophy of Science

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5400

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites 12 hours philosophy course work including PHIL 2440.

PHIL 4440 (3) Topics in Logic

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic. Department enforced prerequisite: 12 hours PHIL course work, including PHIL 2440.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 4450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics. Uses case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5450 and PHYS 4450 and PHYS 5450

Requisites: Requires prerequisite course PHYS 1020 or PHYS 1120 or PHYS 2020 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4460 (3) Modal Logic

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5460

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PHIL 2440.

PHIL 4470 (3) Probability and Rational Choice

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox, and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle, and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons, and Schelling points), and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5470

Recommended: Prerequisite PHIL 2440 and 12 hours philosophy course work.

PHIL 4490 (3) Philosophy of Language

Examines theories and problems regarding the nature of language and its relation to reality. Concepts discussed include sense, reference, conventions, intentions and their relation to science and social life. Relevant literature includes readings in Frege, Russell, Quine, Putnam, Kripke and Chomsky.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5490

Requisites: Requires prerequisite course PHIL 2440 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4600 (1) Theology Forum Seminar

Discusses a variety of theological and philosophical topics. Some reading, much discussion, occasional guest speakers.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4800 (3) Open Topics in Philosophy

See current departmental announcements for specific content.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4830 (3) Senior Seminar in Philosophy

Critical in-depth examination of a selected philosophical topic.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

Recommended: Prerequisite 15 hours philosophy course work.

PHIL 4840 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4950 (3) Honors Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

Additional Information: Arts Sciences Honors Course

Philosophy - Bachelor of Arts (BA)

The undergraduate degree in philosophy emphasizes knowledge and awareness of:

- some of the principal philosophical texts in the history of western philosophy, from its beginnings in Greece to the late 19th century;
- some of the main currents in 20th century philosophy, including some acquaintance with contemporary philosophical issues and modes of inquiry;
- a single major author or a single philosophical movement; and
- elementary formal logic.

In addition, students completing the major will develop the knowledge and skills to:

- form reasoned opinions about the issues—moral, religious, political, etc.—that educated people debate;
- understand, analyze and evaluate complex arguments and theories;
- distinguish between the main thrust of an argument or position and what is ancillary to it;
- discover and critically examine the underlying presuppositions of major systems of ideas or programs for action;
- see important connections between different systems of ideas or programs for action;
- explain difficult ideas and concepts in an informed, effective and coherent manner;
- develop a thesis and present a coherent argument for it;
- write a clear and coherent essay; and
- engage in rational and productive discussion of issues and arguments.

In addition to the general philosophy major, the department offers two topically oriented major tracks that are interdisciplinary in nature: law and society and values and social policy.

Concurrent Degree Program BA/MA in Philosophy

The Philosophy Department offers a five-year program that leads to the concurrent awarding of both the BA and MA in philosophy (p. 1051). Students who successfully complete this program receive the two degrees simultaneously, normally at the end of their fifth year of study.

To complete the concurrent BA/MA program, the student will fulfill separately all requirements for the BA and thesis-based MA, with the exception that two 4000-level courses can satisfy requirements for both the BA and the MA. In addition to these two overlapping 4000-level courses, the student must complete all of the remaining requirements for the general major in philosophy, as well as all of the remaining requirements for the thesis-based MA in philosophy.

For more information, see the department's Concurrent BA/MA Program (<http://www.colorado.edu/philosophy/undergraduate/concurrent-ba-ma-program>) webpage.

Requirements

For the undergraduate degree in philosophy, students must take 33 to 45 credit hours in philosophy, no fewer than 18 of which must be upper division, earning 33 credit hours with a grade of C- or better in each course in philosophy and a C (2.00) average for all work attempted in philosophy. No fewer than 12 of those credit hours must be completed on the Boulder campus. No more than 8 credit hours of independent study may count toward the minimum requirement.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

General Track

Required Courses and Credit Hours

History

PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
Select one of the following:		3
PHIL 4010	Single Philosopher	
PHIL 4020	Topics in the History of Philosophy	
PHIL 4030	Medieval Philosophy	
PHIL 4040	Studies in 20th Century Philosophy	
PHIL 4070	Existentialist Philosophy	
PHIL 4250	Marxism	

Logic

Select one of the following:		3
PHIL 2440	Symbolic Logic	
PHIL 4440	Topics in Logic (Mathematical Logic)	
PHIL 4460	Modal Logic	

Philosophical Writing

PHIL 3480	Critical Thinking/Writing in Philosophy	3
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Values

PHIL 3100	Ethical Theory	3
Select one of the following:		3
PHIL 2140	Environmental Justice	
PHIL 2200	Major Social Theories	
PHIL 2220	Philosophy and Law	
PHIL 2270	Philosophy and Race	
PHIL 2290	Philosophy and Women	
PHIL 3110	Feminist Practical Ethics	
PHIL 3140	Environmental Ethics	
PHIL 3160	Bioethics	
PHIL 3190	War and Morality	
PHIL 3200	Social and Political Philosophy	
PHIL 3260	Philosophy and the International Order	
PHIL 4110	Contemporary Moral Theory	
PHIL 4120	Philosophy and Animals	
PHIL 4200	Contemporary Political Philosophy	
PHIL 4250	Marxism	

Metaphysics and Epistemology

PHIL 4340	Epistemology	3
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Select one of the following:		3
PHIL 3600	Philosophy of Religion	
PHIL 4300	Philosophy of Mind	
PHIL 4360	Metaphysics	
PHIL 4400	Philosophy of Science	
PHIL 4490	Philosophy of Language	

Electives

Two courses which includes all courses that are at the 2000 level or above, and are not taken to satisfy any of the above requirements	6
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Total Credit Hours	33
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The department also offers two topically oriented majors that are interdisciplinary in nature: law and society and values and social policy. These majors require two semesters in the history of philosophy, as well as a series of core courses that vary according to the topic. A student intending to complete a topical major in philosophy should see the departmental undergraduate advisor as soon as possible.

Values and Social Policy Track

Required Courses and Semester Credit Hours

Group I

Required courses:		
PHIL 1440	Critical Thinking	3
or PHIL 2440	Symbolic Logic	
PHIL 2200	Major Social Theories	3
PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
PHIL 3100	Ethical Theory	3
PHIL 3200	Social and Political Philosophy	3

Group II

Select four of the following:		
PHIL 2140	Environmental Justice	
PHIL 2220	Philosophy and Law	
PHIL 2270	Philosophy and Race	
PHIL 2290	Philosophy and Women	
PHIL 3110	Feminist Practical Ethics	
PHIL 3140	Environmental Ethics	
PHIL 3160	Bioethics	
PHIL 3190	War and Morality	
PHIL 3260	Philosophy and the International Order	
PHIL 3930	Internship in Social Policy	
PHIL 4110	Contemporary Moral Theory	
PHIL 4120	Philosophy and Animals	
PHIL 4200	Contemporary Political Philosophy	
PHIL 4250	Marxism	
PHIL 4260	Philosophy of Law	
Other courses with advisor's approval		

Group III

15 credit hours of approved courses in allied fields. For further information, see the Department of Philosophy advisor.	15
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Total Credit Hours	33
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Law and Society Track

Required Courses and Semester Credit Hours

Group I

Required courses:

PHIL 1440	Critical Thinking	3
or PHIL 2440	Symbolic Logic	
PHIL 2200	Major Social Theories	3
PHIL 2220	Philosophy and Law	3
PHIL 3000	History of Ancient Philosophy	3
PHIL 3010	History of Modern Philosophy	3
PHIL 3100	Ethical Theory	3
PHIL 3180	Critical Thinking: Contemporary Topics	3
or PHIL 3480	Critical Thinking/Writing in Philosophy	
PHIL 3200	Social and Political Philosophy	3
PHIL 4260	Philosophy of Law	3

Group II

Recommended courses:

PHIL 2140	Environmental Justice
PHIL 2290	Philosophy and Women
PHIL 3110	Feminist Practical Ethics
PHIL 3140	Environmental Ethics
PHIL 3160	Bioethics
PHIL 3260	Philosophy and the International Order
PHIL 4110	Contemporary Moral Theory
PHIL 4200	Contemporary Political Philosophy
PHIL 4250	Marxism

Group III

Required Courses:

12 credit hours of approved courses from other departments. For further information, see the Department of Philosophy advisor.	12
Total Credit Hours	39

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in philosophy, students should meet the following requirements:

- By the beginning of the second semester, declare the major and meet with an undergraduate advisor at the time the major is declared.
- In each of the next five semesters, complete an average of 6.7 credit hours of required philosophy courses.
- By the end of the fifth semester of study, complete PHIL 2440, PHIL 3480, PHIL 3000 and PHIL 3010.

Philosophy - Minor

A minor is offered in philosophy. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements

For the minor in philosophy, students must take 18 credit hours in philosophy (PHIL), earning 18 credit hours with a grade of C- or better and a 2.00 (C) average for all work attempted in philosophy. Also, students

must take 9 credit hours of upper-division work in philosophy with grades of C- or better. Minor students may apply no more than 9 credit hours, including 6 upper-division credit hours of transfer work, toward a minor.

There are no distribution requirements for a minor in philosophy: any six 3-credit-hour philosophy courses will do, so long as at least three are upper-division. However, for a well-rounded course of study, the Philosophy Department recommends:

Recommended Courses

Logic

At least one course in Logic, such as:

PHIL 1440 Critical Thinking

PHIL 2440 Symbolic Logic

History of Philosophy

At least one course in the History of Philosophy, such as:

PHIL 1010 Introduction to Western Philosophy: Ancient

PHIL 1020 Introduction to Western Philosophy: Modern

PHIL 3000 History of Ancient Philosophy

PHIL 3010 History of Modern Philosophy

Values

At least one course in Values, such as:

PHIL 1100 Ethics

PHIL 1200 Contemporary Social Problems

PHIL 3100 Ethical Theory

PHIL 3200 Social and Political Philosophy

Metaphysics/Epistemology

At least one course in Metaphysics/Epistemology, such as:

PHIL 1400 Philosophy and the Sciences

PHIL 1600 Philosophy and Religion

PHIL 3600 Philosophy of Religion

PHIL 4300 Philosophy of Mind

PHIL 4340 Epistemology

PHIL 4360 Metaphysics

Physics

The curriculum offered by the Department of Physics provides knowledge of the physical concepts that are basic to the laws of nature, and the ability to use these fundamental concepts to answer questions and solve real problems. Students also gain an understanding of the relationship of physics to other fields such as astronomy, biology, engineering, chemistry, and medicine.

Areas of Study

Students can choose from one of three plans leading to the Bachelor of Arts (BA) degree. Plan 1 is designed primarily for students who plan to pursue graduate study in physics or go directly into professional employment. Plan 2 is intended for students who wish to combine a physics major with an interdisciplinary or applied physics focus. Interdisciplinary focuses include applied mathematics, biophysics, chemical physics, environmental science, history and philosophy of science, or pre-medicine. Plan 3 is a program designed specifically for those who wish to become elementary or secondary school teachers. It includes a teaching licensure in cooperation with the School of

Education. A concurrent bachelor's/master's degree (BA/MS) is also available.

The Department of Physics also offers a Bachelor of Science degree in Engineering Physics (p. 724) through the College of Engineering and Applied Science.

Research Opportunities

Physics majors are strongly encouraged to work in a research laboratory. Such experience is especially useful in pursuing a career in science or engineering. Involvement in laboratory experimentation provides knowledge of modern electronic equipment and computerized instrumentation. As contributing members of a research group, students also get a real sense of the creative processes that are part of modern physics research.

Career Opportunities

Physics provides an excellent background for a wide variety of careers, as well as preparation for admission to graduate school in physics and related fields. Design and development work in industrial firms, government and academic laboratories, and nonprofit research centers present opportunities to apply theory to specific problems. In such settings, physics graduates often work closely with engineers, complementing specific disciplines with a broader physics perspective. Graduates can also go on to careers in business, law, finance, or medicine, after appropriate graduate work.

Course code for this program is PHYS.

Bachelor's Degree

- Physics - Bachelor of Arts (BA) (p. 453)

Minor

- Physics - Minor (p. 457)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Dana Z (https://experts.colorado.edu/display/fisid_102371)
Professor; PhD, University of Arizona

Ashby, Neil
Professor Emeritus

Baker, Daniel N (https://experts.colorado.edu/display/fisid_103264)
Distinguished Professor; PhD, University of Iowa

Bartlett, David
Professor Emeritus

Beale, Paul D (https://experts.colorado.edu/display/fisid_101602)
Professor; PhD, Cornell University

Becker, Andreas (https://experts.colorado.edu/display/fisid_146675)
Associate Professor; Dr habil, Universite Laval (Canada)

Betterton, Meredith D (https://experts.colorado.edu/display/fisid_125396)
Associate Professor; PhD, Harvard University

Bolton, Daniel Ryan (https://experts.colorado.edu/display/fisid_155168)
Instructor; PhD, University of Washington

Calkins, Michael Andrew (https://experts.colorado.edu/display/fisid_149720)
Assistant Professor; PhD, University of California-Los Angeles

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Professor Attendant Rank

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Phillipson, Paul E.
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Price, John C (https://experts.colorado.edu/display/fisid_101129)
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Professor Attendant RankLecturer

Wahr, John M.
Professor Emeritus

Wyss, Walter
Professor Emeritus

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Zimmerman, Eric (https://experts.colorado.edu/display/fisid_122809)
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PHYS 1000 (3) Preparatory Physics

Introduces basic physics, emphasizing an analytical approach to prepare for PHYS 1110 and PHYS 1120, the engineering majors sequence. Does not satisfy any MAPS deficiency in either the sciences or math. Department enforced prerequisite: 1 year high school algebra.
Additional Information: Arts Sci Core Curr: MAPS Course

PHYS 1010 (3) Physics of Everyday Life 1

Intended primarily for nonscientists, this course covers physics encountered in everyday life. Topics include balls, scales, balloons, stoves, insulation, light bulbs, clocks, nuclear weapons, basics of flashlights, and microwave ovens. Department enforced prereq., high school algebra or equivalent. This course should not be taken if the student has a MAPS deficiency in math.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab
Arts Sci Core Curr: Quant Reasn Mathmat Skills
Arts Sci Core Curr: Natural Science Sequence
MAPS Course: Chemistry
MAPS Course: Physics

PHYS 1020 (4) Physics of Everyday Life 2

Intended primarily for nonscientists, this course is a continuation of PHYS 1010. Includes electrical power generation and distribution, electrical motors, radio, television, computers, copiers, lasers, fluorescent lights, cameras, and medical imaging. Department enforced prereq., high school algebra.

Requisites: Requires prerequisite course of PHYS 1010 (minimum grade C-).
Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills
Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Lab

PHYS 1110 (4) General Physics 1

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. First semester of three-semester sequence for science and engineering students. Covers kinematics, dynamics, momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1110
Requisites: Requires prerequisite or a corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).
Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab
Arts Sci Core Curr: Natural Science Sequence

PHYS 1115 (4) General Physics 1 for Majors

First semester of three semester sequence for physics, engineering physics and astronomy majors. Covers kinematics, dynamics momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1110
Requisites: Requires a prerequisite or co-requisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-). Restricted to Physics (PHYS-BA) or Engineering Physics (EPEN-BS) or Astronomy (ASTR-BA) majors only.
Grading Basis: Letter Grade

PHYS 1120 (4) General Physics 2

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. Second semester of three-semester introductory sequence for science and engineering students. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1125

Requisites: Requires prerequisite courses of PHYS 1110 or PHYS 1115 and a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade of C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

PHYS 1125 (4) General Physics 2 for Majors

Three lect., one rec per week, plus three evening exams in the fall and spring semesters. Second semester of three semester introductory sequence for physics, engineering and astronomy majors. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1120

Requisites: Requires a prerequisite course of PHYS 1110 or PHYS 1115. Requires a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to Physics (BA), Engineering Physics (BS) and Astrophysics (BA) students only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Sequence

PHYS 1140 (1) Experimental Physics 1

One lect., one 2-hour lab per week. Introduction to experimental physics through laboratory observations of a wide range of phenomena. Covers experiments on physical measurements, linear and rotational mechanics, harmonic motion, wave motion, sound and heat, electricity and magnetism, optics, and electromagnetic waves with the mathematical analysis of physical errors associated with the experimental process.

Requisites: Requires a prerequisite or corequisite course of PHYS 1120 or PHYS 1125 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

PHYS 1230 (3) Light and Color for Nonscientists

Discusses light, color, vision, and perception. Covers reflection, refraction, lenses, and applications to photography and other methods of light sensing. Other topics include lasers and holography. Course is geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1240 (3) Sound and Music

Explores the physical processes that underlie the diversity of sound and musical phenomena. Topics covered include the physical nature of sound, the perception of sound, the perception of pitch and harmony, musical instruments, synthesizers and samplers, and room acoustics. Geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1400 (1) Fundamentals of Scientific Inquiry

Explore and discuss the nature of science and what it means to work in science, technology, engineering or math. Focus on relevant open questions in these fields and the methods used to investigate them. For more information visit: www.colorado.edu/studentgroups/cuprime.

PHYS 1580 (3) Energy and Interactions

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physical content focuses on interactions and energy.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 1580

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

PHYS 2010 (5) General Physics 1

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers mechanics, heat and sound. Thorough presentation of fundamental facts and principles of physics using algebra and trigonometry. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020. Department enforced prerequisites: ability to use high school algebra and trigonometry.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science

PHYS 2020 (5) General Physics 2

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers electricity and magnetism, light and modern physics. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020.

Requisites: Requires a prerequisite course of PHYS 1110 or PHYS 2010 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

PHYS 2130 (3) General Physics 3

Covers special relativity, quantum theory, atomic physics, solid state and nuclear physics. Third semester of introductory sequence for science and engineering students. Physics majors should take PHYS 2170 instead of this course. Normally taken with PHYS 2150.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 2170

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

PHYS 2150 (1) Experimental Physics 2

One lect., one 2-hour lab per week. Includes many experiments of modern physics, including atomic physics, solid state physics, electron diffraction, radioactivity and quantum effects. Normally taken concurrently with PHYS 2130 or PHYS 2170, this course may be taken after PHYS 2130 or PHYS 2170.

Requisites: Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of PHYS 2130 or PHYS 2170 (all minimum grade C-).

PHYS 2170 (3) Foundations of Modern Physics

Covers special relativity, quantum mechanics and atomic structure. Completes the three-semester sequence of general physics for physics and engineering physics majors. Normally taken with the laboratory PHYS 2150.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 2130

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

PHYS 2210 (3) Classical Mechanics and Mathematical Methods 1

Theoretical Newtonian mechanics, including position and velocity dependent forces, oscillation, stability, non-inertial frames and gravitation from extended bodies. Ordinary differential equations, vector algebra, curvilinear coordinates, complex numbers, and Fourier series will be introduced in the context of the mechanics.

Requisites: Requires a prerequisite course of PHYS 2130 or PHYS 2170 and a prerequisite or corequisite course of APPM 2360 or MATH 3430 (all minimum grade C-).

PHYS 2840 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 3000 (3) Science and Public Policy

For nonscience majors. Reading, discussions, debates and lectures are used to study how science affects society economically, intellectually, and in terms of health and national security. Another focus is how government fosters and funds scientific activities. Department enforced prerequisite: completion of core science requirement.

PHYS 3050 (3) Writing in Physics: Problem-Solving and Rhetoric

Teaches strategies used in scientific writing with an emphasis on argument, reviews and reinforces essential writing skills, provides experience in writing both academic and professional communications in a style appropriate to the literature of physics. Department enforced prerequisite: lower-division core writing requirement.

Requisites: Requires a prerequisite course of PHYS 2130 or PHYS 2170 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Written Communication

PHYS 3070 (3) Energy and the Environment

Contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Included are some basic physical concepts and principles that often constrain choices. No background in physics is required.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3070

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

PHYS 3210 (3) Classical Mechanics and Mathematical Methods 2

Lagrangian and Hamiltonian treatment of theoretical mechanics, including coupled oscillations, waves in continuous media, central force motion, rigid body motion and fluid dynamics. The calculus of variations, linear algebra, tensor algebra, vector calculus, and partial differential equations will be introduced in the context of the mechanics.

Requisites: Requires a prerequisite course of PHYS 2210 (minimum grade C-).

PHYS 3220 (3) Quantum Mechanics 1

Introduces quantum mechanics with wave, operator and matrix computational techniques. Investigates solutions for harmonic oscillator, potential well and systems with angular momentum. Develops a quantitative description of one-electron atoms in lowest order.

Requisites: Requires a prerequisite course of PHYS 3210 (minimum grade C-).

PHYS 3221 (1) Tutorial Practicum for Quantum Mechanics 1

Uses interactive group work to aid student learning in co-requisite course PHYS 3220. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

Requisites: Requires a corequisite course of PHYS 3220.

Grading Basis: Pass/Fail

PHYS 3310 (3) Principles of Electricity and Magnetism 1

Covers mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, and polarized media, and provides an introduction to electromagnetic fields, waves, and special relativity.

Requisites: Requires prerequisite courses of PHYS 2210 (minimum grade C-).

PHYS 3311 (1) Tutorial Practicum for Electricity & Magnetism 1

Uses interactive group work to aid student learning in co-requisite course PHYS 3310. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

Requisites: Requires a corequisite course of PHYS 3310.

Grading Basis: Pass/Fail

PHYS 3320 (3) Principles of Electricity and Magnetism 2

Continuation of PHYS 3310. Electromagnetic induction; magnetic energy; microscopic theory of magnetic properties; AC circuits; Maxwell's Equations; planewaves; waveguides and transmission lines; radiation from electric and magnetic dipoles and from an accelerated charge.

Requisites: Requires a prerequisite course of PHYS 3310 (minimum grade C-).

PHYS 3330 (2) Electronics for the Physical Sciences

Introduces laboratory electronics for physical science students. Includes basic electronic instruments, dc bridge circuits, operational amplifiers, bipolar transistors, field-effect transistors, photodiodes, noise in electronic circuits, digital logic and microcontrollers. Students gain hands-on experience in designing, building and debugging circuits. Two lectures and one three hour laboratory per week. Concludes with a three-week project in which students design and build an experiment of their choice and present a seminar on the results.

Requisites: Requires prerequisite courses of PHYS 2150 and PHYS 2130 or PHYS 2170 (all minimum grade C-).

PHYS 4130 (3) Biological Electron Microscopy: Principles and Recent Advances

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stem, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5130

Requisites: Requires a prerequisite course of EBIO 1220 or MCDB 1150 or MCDB 4550 or MCDB 5550 or PHYS 1120 or PHYS 2020 (minimum grade D-).

PHYS 4150 (3) Plasma Physics

Discusses the fundamentals of plasma physics, including particle motion in electromagnetic fields, wave propagation, collisions, diffusion, and resistivity. Presents examples from space plasmas, astrophysical plasmas, laboratory fusion plasmas, and plasmas in accelerators.

Requisites: Requires a prerequisite course of PHYS 3310 and a prerequisite or corequisite course of PHYS 3320 (all minimum grade of C-).

PHYS 4230 (3) Thermodynamics and Statistical Mechanics

Statistical mechanics applied to macroscopic physical systems; statistical thermodynamics, classical thermodynamics systems; applications to simple systems. Examines relationship of statistical to thermodynamic points of view.

Requisites: Requires a prerequisite course of PHYS 2210 and a prerequisite or corequisite course of PHYS 3220 (all minimum grade of C-).

PHYS 4340 (3) Introduction to Solid State Physics

Discusses crystal structure, lattice dynamics, band theory, semiconductors and ferromagnetism.

Requisites: Requires a prerequisite course of PHYS 3220 (minimum grade of C-).

PHYS 4410 (3) Quantum Mechanics 2

Extends quantum mechanics to include perturbation theory and its applications to atomic fine structure, multi-particle systems, interactions with external forces, the periodic table and dynamical processes including electromagnetic transition rates.

Requisites: Requires prerequisite courses of PHYS 3220 and PHYS 3310 (all minimum grade of C-).

PHYS 4420 (3) Nuclear and Particle Physics

Introduces structure of the atomic nucleus, spectroscopy of subnuclear particles, scattering, reactions, radioactive decay, fundamental interactions of quarks and leptons.

Requisites: Requires a prerequisite course of PHYS 4410 (minimum grade of C-).

PHYS 4430 (3) Advanced Laboratory

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5430

Requisites: Requires a prerequisite course of PHYS 3330 (minimum grade of C-).

PHYS 4450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5450 and PHIL 4450 and PHIL 5450

Requisites: Requires a prerequisite course of PHYS 1020 or PHYS 1120 or PHYS 1125 or PHYS 2020 (minimum grade of C-).

PHYS 4460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching and education research.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5460 and EDUC 4460 and EDUC 5460

Requisites: Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade of C-).

PHYS 4510 (3) Optics

Basic electromagnetic theory of light, using Maxwell's equations. Examples in geometrical optics; extensive applications in physical optics including diffraction and polarization. Spectra, including Zeeman effect and fluorescence. Recent advances in experimental techniques: microwaves, lasers, image converters.

Requisites: Requires a prerequisite course of PHYS 3320 (minimum grade of C-).

PHYS 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extra-cellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5550 and MCDB 4550 and MCDB 5550

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 or MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

PHYS 4560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5560 and MCDB 4560 and MCDB 5560

Requisites: Requires a prerequisites course of PHYS 2210 (minimum grade C-).

Recommended: Prerequisite PHYS 4230.

Grading Basis: Letter Grade

PHYS 4610 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4620 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4620 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4630 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4620. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4810 (1-3) Special Topics in Physics

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4840 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4850.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4850 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4840.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4970 (3) Seminar on Physical Methods in Biology

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, Eels, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, Cat), Fourier analysis, synchrotron radiation, Exafs, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5970

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 2020 and MCDB 1150 or EBIO 1220 (all minimum grade D-).

Physics - Bachelor of Arts (BA)

The undergraduate degree in physics emphasizes knowledge and awareness of:

- the basic subfields of physics (classical mechanics, electricity and magnetism, quantum mechanics, statistical mechanics and

thermodynamics), as well as at least one specialty area of application (e.g., solid state physics or optics);

- the major principles of physics, their historical development and the roles they play in the various subfields of physics;
- the interrelations between theory and observation, the role of systematic and random experimental errors and methods used to analyze experimental uncertainty and compare experiment with theory;
- physical phenomena and experience in the use of basic experimental apparatus and measuring instruments;
- mathematics sufficient to facilitate the acquisition and application of physical principles; and
- the importance of physics in other fields such as chemistry, biology, engineering, medicine and in society at large.

In addition, students completing the degree in physics are expected to acquire the ability and skills to:

- apply physical principles to new situations;
- construct and assemble experimental apparatus, conduct and analyze measurements of physical phenomena, analyze experimental uncertainty and make meaningful comparisons between experiment and theory; and
- communicate results of scientific inquiries verbally and in writing.

Plans of Study

Three different plans are available to students in physics. Because there is some flexibility within each plan, the department encourages students to pursue their own interests in setting up their curriculum. The final responsibility for fulfilling the requirements for the degree rests with the student.

Plan I

This plan is primarily for students planning graduate work in physics.

Plan II

This plan is for students desiring either an interdisciplinary or an applied physics program.

The interdisciplinary program includes a combination of a physics major with a focus in another area such as astrophysics, atmospheric sciences, applied mathematics, biophysics, chemical physics, computer science, environmental sciences, geophysics, philosophy and history of science, and pre-medicine.

The applied physics program includes a focus on applying physics to a field such as biotechnology, optics, and electronic devices.

Plan III

This plan is for students intending to become elementary or secondary school teachers.

Concurrent Degree Program BA/MS in Physics

The BA/MS program in physics aims to provide new opportunities for undergraduate physics majors. The program is specifically addressed to the students in the Plan 1 Major Program of the Department of Physics. The Plan 1 physics major gives students a thorough grounding in theoretical physics so that they are well prepared either to proceed with graduate work or with professional employment. For students

interested in graduate studies, the BA/MS program in physics allows for participation in graduate course work and research in a broad range of areas. For students interested in immediate professional employment, the BA/MS program would serve as a terminal degree program that qualifies students for a higher level of employment.

For more information, see the Department of Physics website (<http://www.colorado.edu/physics/academics/undergraduate-students/concurrent-bachelorsmasters-degree>).

Contents

- Plan I (p. 454)
- Plan II (p. 454)
- Plan III (p. 455)
- Sample Four-Year Plan of Study (p. 455)
- Graduating in Four Years (p. 457)

Requirements

Students who have declared physics as a major are required to consult with the departmental advisor at least once per semester. Even if first-year students are only considering physics as a major, they are strongly encouraged to visit the departmental advisor and discuss the situation. Because most of the advanced physics courses have various prerequisites, failure to settle on an appropriate plan of study early in the college career can result in delay and complications later.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Plan I

This plan includes 45 credit hours of physics courses.

Required Courses and Semester Credit Hours

Required Physics Courses

PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2	8
PHYS 1140	Experimental Physics 1	1
PHYS 2150	Experimental Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3330	Electronics for the Physical Sciences	2
PHYS 4230	Thermodynamics and Statistical Mechanics	3
PHYS 4410	Quantum Mechanics 2	3

Upper-Division Physics Electives

Select a research activity - see details below (3-6 credit hours)

PHYS 4430	Advanced Laboratory	
PHYS 4610 & PHYS 4620 & PHYS 4630	Physics Honors and Physics Honors and Physics Honors	
PHYS 4840	Independent Study	

Select upper-division physics theory electives (3-6 credit hours)

PHYS 4150	Plasma Physics	
PHYS 4340	Introduction to Solid State Physics	

PHYS 4420	Nuclear and Particle Physics	
PHYS 4450	History and Philosophy of Physics	
PHYS 4460	Teaching and Learning Physics	
PHYS 4510	Optics	
PHYS 4550	Cells, Molecules and Tissues: A Biophysical Approach	
PHYS 4560	Introduction to Biophysics	
PHYS 4810	Special Topics in Physics	
PHYS 5030	Intermediate Mathematical Physics 1	
PHYS 5040	Intermediate Mathematical Physics 2	
PHYS 5770	Gravitational Theory (Theory of General Relativity)	
Other PHYS or ASTR upper-division courses as approved in advance by advisor.		

Ancillary Mathematics Courses

MATH 1300	Calculus 1	4-5
or APPM 1350	Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
or APPM 1360	Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
or APPM 2350	Calculus 3 for Engineers	

Select one of the following: 4-6

APPM 2360	Introduction to Differential Equations with Linear Algebra	
MATH 2130 & MATH 3430	Introduction to Linear Algebra for Non-Mathematics Majors and Ordinary Differential Equations	

Ancillary Chemistry Courses

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5

Total Credit Hours 71-75

Research Activity

The research activity may be completed in one of the following ways:

1. Between 3 and 6 credit hours may be earned from: PHYS 4430, PHYS 4610/PHYS 4620/PHYS 4630, or PHYS 4840.
2. By documentation of your accomplishments as an intern with a research activity within the physics department or a suitable cognate department, institute or external entity such as NCAR, NIST, NOAA, etc.
 - Approval by a physics department advisor is required for option (2) and should be obtained in advance.
 - No academic credit is earned under the internship option (2), so if an internship is taken, students must still earn 9 credit hours of physics electives.

Plan II

For the interdisciplinary program, 33 credit hours of physics courses, plus 3 credit hours of physics electives, plus 12 credit hours of interdisciplinary courses are required. For the applied physics program, 33 credit hours of physics courses plus 15 credit hours of applied physics courses are required. Courses in the interdisciplinary or applied physics subjects may not be double-counted with the required 33 credit hours of physics courses.

Interdisciplinary or applied physics courses must be approved by the physics department, either by the pre-approved list of courses in each discipline or by a physics department mentor on a course-by-course basis. It is therefore imperative that students in Plan II be in close contact with the physics department advisor.

Required Courses and Semester Credit Hours

Required Physics Courses

PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2	8
PHYS 1140	Experimental Physics 1	1
PHYS 2150	Experimental Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3220	Quantum Mechanics 1	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 3330	Electronics for the Physical Sciences	2
PHYS 4230	Thermodynamics and Statistical Mechanics	3

Select the interdisciplinary program or the applied physics program: 15

Interdisciplinary Program

Select 12 credit hours from an interdisciplinary focus, as well as 3 credit hours of upper-division physics electives from the departmental list ¹

Applied Physics Program

Select 15 credit hours in the applied physics program from the departmental list ¹

Ancillary Mathematics Courses

MATH 1300	Calculus 1	4-5
	or APPM 1350 Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
	or APPM 1360 Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
	or APPM 2350 Calculus 3 for Engineers	

Select one of the following: 4-6

APPM 2360 Introduction to Differential Equations with Linear Algebra

MATH 2130 Introduction to Linear Algebra for Non-Mathematics Majors & MATH 3430 Mathematics Majors and Ordinary Differential Equations

Ancillary Chemistry Courses

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5

Total Credit Hours 74-78

¹ Departmental lists of approved courses for the interdisciplinary and applied physics programs are available in the advising guide on the Department of Physics website (<http://www.colorado.edu/physics>).

Plan III

This plan involves a minimum of 31–34 credit hours of physics and a minimum of 35 credit hours in education courses. A School of Education advisor, who should be consulted for updated requirements,

is available by appointment at 303-492-2559. Students must review the Undergraduate Program of Studies Checklist for Elementary or Secondary Science for Arts & Sciences majors on the School of Education website for current teacher licensure requirements.

Required Courses and Semester Credit Hours

Required Physics and Astronomy Courses

PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2	8
PHYS 1140	Experimental Physics 1	1
PHYS 2130	General Physics 3	3
PHYS 2150	Experimental Physics 2	1
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3330	Electronics for the Physical Sciences	2
PHYS 4460 or PHYS 4450	Teaching and Learning Physics or History and Philosophy of Physics	3
ASTR 1030	Accelerated Introductory Astronomy 1	4

Additional required course for teaching in secondary schools

PHYS 3220	Quantum Mechanics 1	3
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Ancillary Chemistry Courses

Select one of the following options: 7-10

Option 1:

CHEM 1011 Environmental Chemistry 1 & CHEM 1031 and Environmental Chemistry 2

Option 2:

CHEM 1113 General Chemistry 1 & CHEM 1114 and Laboratory in General Chemistry 1

CHEM 1133 General Chemistry 2 & CHEM 1134 and Laboratory in General Chemistry 2

Ancillary Mathematics Courses

MATH 1300	Calculus 1	4-5
	or APPM 1350 Calculus 1 for Engineers	
MATH 2300	Calculus 2	4-5
	or APPM 1360 Calculus 2 for Engineers	
MATH 2400	Calculus 3	4
	or APPM 2350 Calculus 3 for Engineers	

Select one of the following: 4-6

APPM 2360 Introduction to Differential Equations with Linear Algebra

MATH 2130 Introduction to Linear Algebra for Non-Mathematics Majors & MATH 3430 Mathematics Majors and Ordinary Differential Equations

Total Credit Hours 57-64

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
PHYS 1110	General Physics 1	4

MATH 1300 or APPM 1350	Calculus 1 or Calculus 1 for Engineer	5
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CORE: Content Area of Study 3

CORE: Skills Acquisition (ex: Lower-Division Written Communication) 3

Credit Hours 15

Spring Semester

PHYS 1120	General Physics 2	4
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PHYS 1140	Experimental Physics 1	1
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MATH 2300 or APPM 1360	Calculus 2 or Calculus 2 for Engineer	5
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CORE: Content Area of Study 3

CORE: Content Area of Study 3

Credit Hours 16

Year Two

Fall Semester

PHYS 2170	Foundations of Modern Physics	3
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PHYS 2150	Experimental Physics 2	1
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MATH 2400 or APPM 2350	Calculus 3 or Calculus 3 for Engineer	4
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CHEM 1113	General Chemistry 1	4
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CHEM 1114	Laboratory in General Chemistry 1	1
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MATH 2130	Introduction to Linear Algebra for Non- Mathematics Majors (or CORE if completing APPM track)	3
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Credit Hours 16

Spring Semester

PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
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MATH 3430 or APPM 2360	Ordinary Differential Equations or Introduct to Different Equation with Linear Algebra	3
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CHEM 1133	General Chemistry 2	4
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CHEM 1134	Laboratory in General Chemistry 2	1
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CORE: Content Area of Study 3

Credit Hours 14

Year Three

Fall Semester

PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
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PHYS 3310	Principles of Electricity and Magnetism 1	3
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PHYS 3330	Electronics for the Physical Sciences	2
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CORE: Content Area of Study 3

CORE: Content Area of Study 3

Elective/MAPS 3

Credit Hours 17

Spring Semester

PHYS 3220	Quantum Mechanics 1	3
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PHYS 3320	Principles of Electricity and Magnetism 2	3
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CORE: Content Area of Study 3

Elective/MAPS 3

Elective/MAPS 3

Credit Hours 15

Year Four

Fall Semester

PHYS 4230	Thermodyna and Statistical Mechanics	3
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PHYS 4410	Quantum Mechanics 2	3
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PHYS: Upper-Division Elective (9 credit hours required, see Degree Audit for choices) 3

CORE: Skills Acquisition (ex: Upper-Division Written Communication) 3

Elective/MAPS 3

Credit Hours 15

Spring Semester

PHYS: Upper-Division Elective (9 credit hours required, see Degree Audit for choices) 3

PHYS: Upper-Division Elective (9 credit hours required, see Degree Audit for choices) 3

CORE: Content Area of Study 3

Elective/MAPS	3
Credit Hours	12
Total Credit Hours	120

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in physics plans I and II, students should meet the following requirements:

- In the first semester, declare the physics major.
- By the end of the second semester, complete PHYS 1110, PHYS 1120, PHYS 1140, MATH 1300 or APPM 1350 and MATH 2300 or APPM 1360.
- By the end of the fourth semester, complete PHYS 2150, PHYS 2170 and PHYS 2210, CHEM 1113, CHEM 1133, MATH 2400 or APPM 2350 and APPM 2360. MATH 2130 and MATH 3430 can substitute for APPM 2360.
- Before the fifth semester, meet with the physics advisor to get approval for completion plan (FSACP). In addition to completing PHYS 4230 and PHYS 4410, Plan I students must get approval to complete 9 credit hours in physics electives, with a research participation component. In addition to completing PHYS 4230, interdisciplinary Plan II students must complete 3 credit hours of physics electives and 12 credit hours of interdisciplinary courses. Applied physics students must complete 15 credit hours of applied physics courses.
- By the end of the sixth semester, complete PHYS 3210, PHYS 3220, PHYS 3310, PHYS 3320 and PHYS 3330.
- Early in the seventh semester, meet with the physics advisor to have the statement of major status filled in. This includes a plan for completing the requirements of the major during the senior year and must be signed by the student and the advisor. Further details concerning the execution of the guarantee can be obtained from the department.

Physics - Minor

A minor is offered in physics. Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. For more information, see the Department of Physics Minor in Physics (<http://www.colorado.edu/physics/academics/undergraduate-students/minoring-physics>) webpage.

Requirements

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school. The minimum number of credit hours for a student without advanced placement or transfer credit is 25 hours (16 lower-division and 9 upper-division). *All of the required physics classes listed below have co-requisite or prerequisite mathematics courses. Please check to see if you meet these requisites.*

Required Courses and Semester Credit Hours

Required Physics Courses	16
PHYS 1110 General Physics 1	
PHYS 1120 General Physics 2	
PHYS 1140 Experimental Physics 1	

PHYS 2130	General Physics 3	
	or PHYS 2170 Foundations of Modern Physics	
PHYS 2150	Experimental Physics 2	
PHYS 2210	Classical Mechanics and Mathematical Methods 1	
Upper-Division Physics Electives		
Select three of the following upper-division courses:		9
PHYS 3210	Classical Mechanics and Mathematical Methods 2	
PHYS 3220	Quantum Mechanics 1	
PHYS 3310	Principles of Electricity and Magnetism 1	
PHYS 3320	Principles of Electricity and Magnetism 2	
PHYS 4230	Thermodynamics and Statistical Mechanics	
Total Credit Hours		25

Political Science

The Department of Political Science offers instruction and research in the art and science of politics. Work within the department is organized around six basic fields: American government and politics, comparative politics, international relations, public policy, political theory and empirical theory and methodology. The department's mission is to understand the political world and give students skills for a lifetime of inquiry, engagement, and analysis.

The undergraduate program equips students with the analytical and writing skills essential for work in government agencies, non-governmental organizations, non-profits, and business. It also prepares students for study at the graduate level in political science, law, and other cognate disciplines.

Our mission is to provide students with the knowledge and tools to understand important political ideas, political institutions (both domestic and international), and political actors. Students learn the philosophical basis of justice, equality, and representation, and how those concepts are manifested in ongoing political events. Understanding the issues surrounding diversity and their political consequences, both globally and domestically, are important areas of study. A strong grasp of the American political system and society is coupled with learning about how other countries and societies organize politically. Another important component includes understanding why some countries cooperate while others engage in conflict. Finally, the major exposes students to real-world problems that require political solutions, and trains students to operate effectively in a dynamic and complex global environment.

Below is a sample of current courses which represent areas of inquiry within our curriculum.

PSCI 2116	Introduction to Environmental Policy and Policy Analysis	3
PSCI 3062	Revolution and Political Violence	3
PSCI 3074	Democracy and Its Citizens in the US and EU	3
PSCI 3225	Strategy and Politics	3
PSCI 3271	Law and Society: Legal Institutions and Human Behavior	3
PSCI 3774	Free Speech and Dangerous Ideas	3
PSCI 4183	International Law	3
PSCI 4243	Modern Warfare: Terrorism, Ideology, Identity	3
PSCI 4771	Civil Rights and Liberties in America	3

Undergraduate Learning Outcomes

The political science curriculum is designed to develop the following learning outcomes:

- a solid grounding in politics and the ideas that motivate them at the national and international level
- the ability to both clearly and persuasively articulate ideas and arguments in oral presentation and in written form
- the ability to analyze problems using logical inference based on quantitative and qualitative evidence
- the ability to critically evaluate arguments both in political science research and in our current political world

To learn more about our program please visit our website: <http://www.colorado.edu/polisci/>.

Students interested in political science may want to consider the Global Studies Residential Academic Program.

Course code for this program is PSCI.

Bachelor's Degree

- Political Science - Bachelor of Arts (BA) (p. 466)

Minor

- Political Science - Minor (p. 468)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Edward Scott (https://experts.colorado.edu/display/fisid_108903)
Professor; PhD, Columbia University In the City of New York

Andersson, Krister Par (https://experts.colorado.edu/display/fisid_140076)
Professor; PhD, Indiana University Bloomington

Aydin, Aysegul (https://experts.colorado.edu/display/fisid_143789)
Associate Professor; PhD, SUNY at Binghamton

Baird, Vanessa Anne (https://experts.colorado.edu/display/fisid_115297)
Associate Professor; PhD, University of Houston-University Park

Baker, Andrew B. (https://experts.colorado.edu/display/fisid_144377)
Associate Professor; PhD, University of Wisconsin-Madison

Bayard de Volo, Lorraine M. (https://experts.colorado.edu/display/fisid_143611)
Associate Professor; PhD, University of Michigan Ann Arbor

Bearce, David H. (https://experts.colorado.edu/display/fisid_147837)
Professor; PhD, Ohio State University

Beer, Francis A.
Professor Emeritus

Bickers, Kenneth Norman (https://experts.colorado.edu/display/fisid_130482)
Professor; PhD, University of Wisconsin-Madison

Boulding, Carew Elizabeth (https://experts.colorado.edu/display/fisid_144417)
Associate Professor; PhD, University of California-San Diego

Brown, David S (https://experts.colorado.edu/display/fisid_110166)
Professor; PhD, University of California-Los Angeles

Brown, Hank
Professor Emeritus

Brunner, Ronald D.
Professor Emeritus

Chan, Steve S (https://experts.colorado.edu/display/fisid_102816)
Professor; PhD, University of Minnesota Twin Cities

Chen, Ming Hsu (https://experts.colorado.edu/display/fisid_149591)
Associate Professor; PhD, University of California-Berkeley

Clarke, Susan E.
Professor Emeritus

Costain, Anne N.
Professor Emeritus

Deutmeyer, Megan Shannon (https://experts.colorado.edu/display/fisid_154265)
Associate Professor; PhD, University of Iowa

Donavan, Janet Lynn (https://experts.colorado.edu/display/fisid_145270)
Senior Instructor; PhD, University of Wisconsin-Madison

Eckart, Dennis R.
Professor Emeritus

Ferguson, Michaele L. (https://experts.colorado.edu/display/fisid_129299)
Associate Professor; PhD, Harvard University

Fitch, J. Samuel
Professor Emeritus

Fitzgerald, Jennifer L (https://experts.colorado.edu/display/fisid_140086)
Associate Professor; PhD, Brown University

Greenberg, Edward S.
Professor Emeritus

Griffin, John David (https://experts.colorado.edu/display/fisid_151708)
Associate Professor; PhD, Duke University

Jupille, Joseph H (https://experts.colorado.edu/display/fisid_140088)
Associate Professor; PhD, University of Washington

Kanner, Michael David (https://experts.colorado.edu/display/fisid_100925)
Lecturer

Mapel, David Reed (https://experts.colorado.edu/display/fisid_104552)
Associate Professor; PhD, Johns Hopkins University

Mclver, John P.
Professor Emeritus

Mewes, Horst (https://experts.colorado.edu/display/fisid_102085)
Associate Professor; PhD, University of Chicago

Parinandi, Srinivas C (https://experts.colorado.edu/display/fisid_155589)
Assistant Professor; PhD, University of Michigan Ann Arbor

Safran, William
Professor Emeritus

Scarritt, James R.
Professor Emeritus

Shin, Adrian (https://experts.colorado.edu/display/fisid_158138)
Assistant Professor; PhD, University of Michigan Ann Arbor

Sloan, Royal Daniel Jr
Professor Emeritus

Sokhey, Anand Edward (https://experts.colorado.edu/display/fisid_147113)
Associate Professor; PhD, Ohio State University

Sokhey, Sarah Wilson (https://experts.colorado.edu/display/fisid_147614)
Assistant Professor; PhD, Ohio State University

Steinmo, Sven H (https://experts.colorado.edu/display/fisid_105905)
Professor; PhD, University of California-Berkeley

Strayhorn, Joshua Aaron (https://experts.colorado.edu/display/fisid_152584)
Assistant Professor; PhD, Emory University

Tir, Jaroslav (https://experts.colorado.edu/display/fisid_149842)
Professor; PhD, University of Illinois at Urbana-Champaign

Vanderheiden, Steven Jon (https://experts.colorado.edu/display/fisid_144759)
Associate Professor; PhD, University of Wisconsin-Madison

Wolak, Jennifer Lynn (https://experts.colorado.edu/display/fisid_133263)
Associate Professor; PhD, University of North Carolina Chapel Hill

Young, Gregory D (https://experts.colorado.edu/display/fisid_143374)
Instructor

PSCI 1101 (3) Introduction to American Politics

Emphasizes interrelations among levels and branches of government, formal and informal institutions, processes, and behavior.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Departmental Category: American

MAPS Course: Social Science

MAPS Course: Social Science US Context

PSCI 2004 (3) Survey of Western Political Thought

Studies main political philosophies and political issues of Western culture, from antiquity to 20th century.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Ideals and Values

Departmental Category: Political Theory

PSCI 2012 (3) Introduction to Comparative Politics

Most countries confront a variety of common political problems, including how to gain popular support, what kinds of political institutions are most appropriate, and how to distribute burdens and benefits to different segments of the population. Concentrates on learning how to compare different political systems and provides illustrative examples from several countries in both the industrialized and nonindustrialized world.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Comparative

PSCI 2028 (3) Special Topics

Offers subjects not covered by existing courses. Offered when department approves a special topic.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSCI 2075 (3) Quantitative Research Methods

Introduces quantitative research methods used in political science.

Focuses on basic tools of analysis: data collection, processing, and evaluation, with special attention to survey techniques. Includes elite and case study analysis; aggregate, cluster, and content analysis; and the use of computers in political research.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

Departmental Category: Empirical Theory and Research Methodology

PSCI 2106 (3) Introduction to Public Policy Analysis

Studies policymaking processes in American government, factors shaping public decision, and issues and questions relevant to political inquiry.

Additional Information: Departmental Category: Public Policy

PSCI 2116 (3) Introduction to Environmental Policy and Policy Analysis

Teaches a systematic general framework for the analysis of environmental policy issues. Analyzes the interaction of environmental sciences, ethics, and policy across a range of environmental policy problems. Stresses critical thinking and practical applications.

Additional Information: Departmental Category: Public Policy

PSCI 2223 (3) Introduction to International Relations

Introduces the field of international relations, with general survey of the theories, histories, and problems of historical and contemporary relations among state and nonstate actors.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Departmental Category: International Relations

PSCI 2481 (3) Introduction to the Legal Process

Covers basic legal concepts and processes emphasizing the American system. Gives special attention to political functions of law.

Recommended as preparation for PSCI 4241.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3011 (3) The American Presidency and the Executive Branch

Examines the constitutional, institutional and historical development of the presidency and the federal bureaucracy. Explores the changing role of the executive branch in the U.S. political system over time and competing views of executive power.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American

PSCI 3021 (3) U.S. Campaigns and Elections

Introduces students to the subjects, techniques, and findings of Political Science research on campaigns and elections. Particular emphasis is placed on the study of voting, campaign effects, partisan coalitions, electoral rules, campaign finance, and the policy impact of elections.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American

PSCI 3022 (3) Russian Politics

Examines the development of Russian politics from the late Soviet period to the present. Topics covered include political culture, democratic transition, economic reform, and social problems in Russia.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 3031 (3) Political Parties and Interest Groups

Highlights the practice of party politics in the United States, including the nature, structure, organization, and functions of political parties and interest groups. Analyzes interest group politics and political behavior.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3032 (3) Democracy, Inequality and Violence in Latin America

Stresses different perspectives on Latin American politics and understanding key political actors and processes. Country focus varies.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 3041 (3) The American Congress

Provides intensive examination of the role of Congress in American government, including congressional elections, representation, the organization of Congress, and congressional policy making. Examines larger context of congressional politics, including political parties, the president, and interest groups.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3051 (3) Public Opinion and Political Behavior

Examines measurement of public opinion and evaluation of its impact on governmental policy formation, including survey research techniques.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3052 (3) Gender and Politics in Latin America

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution, and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations, and the differential impact of political, economic, and social changes on men and women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3650

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2600 or PSCI 3032.

Additional Information: Departmental Category: Comparative

PSCI 3054 (3) American Political Thought

Highlights the development of American political theories and ideas from colonial period to present. Can also be taken for American field credit.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004.

Additional Information: Arts Sci Core Curr: United States Context

Arts Sci Core Curr: Ideals and Values

Departmental Category: Political Theory

PSCI 3061 (3) State Government and Politics

Examines politics in the American states from a comparative and historical perspective. Considers major political actors—interest groups, citizens (direct democracy), and political parties, as well as central institutions, in the state political arena. Also focuses on major state public policy concerns.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: American

PSCI 3062 (3) Revolution and Political Violence

Studies and evaluates alternative theoretical frameworks for the analysis of revolution and political violence. Theoretical material is firmly couched in case situations, such as ethnic, class, colonial, urban, racial, and religious conflicts.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101 or PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative

PSCI 3064 (3) Environmental Political Theory

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

Equivalent - Duplicate Degree Credit Not Granted: ENV5 3064

Recommended: Prerequisite PSCI 2004.

Additional Information: Arts Sci Core Curr: Ideals and Values

Departmental Category: Political Theory

PSCI 3071 (3) Urban Politics

Examines the structure of political, social, and economic influence in urban areas. Focuses on the relationship of the political system to governmental, social, and economic institutions and the contemporary policy processes in American cities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American

PSCI 3072 (3) Government and Politics in Southeast Asia

Surveys historical and contemporary forces shaping politics in Southeast Asia. Gives special attention to comparative political economy, including development strategies and transitions to democracy.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 3074 (3) Democracy and Its Citizens in the US and EU

Studies theories and problems related to citizenship in the US and the EU. This includes rights and restrictions of citizenship, issues of immigration, multicultural citizenship, globalization and citizenship. In the EU the relation between member nation citizenship and EU citizenship is a special problem. Examines how the US and EU compare.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Political Theory

PSCI 3082 (3) Political Systems of Sub-Saharan Africa

Analyzes post-independence and post-Cold War change in sub-Saharan Africa and provides intensive case studies of selected countries exemplifying each type with South Africa seen as a special case.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 3084 (3) Diversity, Disagreement, and Democracy: an Introduction to the Theory and Practice of Democracy

Examines the justification and limits for moral, political and religious pluralism. Students will be trained in the practice of dialogue and research the historical context of a subject that would be appropriate for a dialogue, and then interview members of the community who have different perspectives on the subject.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Political Theory

PSCI 3091 (3) Politics of Social Movements

Examines theoretical and empirical research on social movements from a U.S. perspective. Considers why social movements arise, who participates in them, the tactics they employ, obstacles they face, and their political impact.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3092 (3) Comparative Political Economy

Presents theories on the interaction between policies and economics, economic models of politics, and familiarizes students with an approach that will prove useful in understanding current developments in both economics and politics. Explores relationships between financial markets, currency regimes and politics with some special consideration of the behavioral foundations of political and economic developments.

Recommended prerequisite: PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 3101 (3) Black Politics

Examines structure of political, social, and economic influence in urban areas. Focuses on the relationship of political processes to governmental, social, and economic institutions and contemporary policy processes in American cities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American

PSCI 3102 (3) South Asian Politics

Examine the diverse political trajectories of four South Asian countries: India, Pakistan, Nepal, and Sri Lanka. Using a comparative lens, we will take into account historical, cultural, and economic, in addition to political, factors in deciphering this diversity of political paths.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 3105 (3) Designing Social Inquiry: An Introduction to Analyzing Political Phenomena

Tackles conceptualization and measurement with a focus on reliability and validity of measures at the individual level. Explores how improper measurement and conceptualization can affect our inferences. Investigates how to use the tools of causal logic with statistical tools to differentiate linear, spurious, intervening and conditional relationships with a particular focus on what it means to "control for other factors".

Requisites: Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Empirical Theory and Research Methodology

PSCI 3123 (3) War, Peace, and Strategic Defense

Analyzes employment, or the threat of employing force, in securing American interests in the post-Cold War world. Gives special attention to utilities claimed for nuclear weapons, and alternatively, to weapons control and disarmament.

Equivalent - Duplicate Degree Credit Not Granted: PACS 3800

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 3143 (3) Current Affairs in International Relations

Analyzes the various theoretical and policy challenges facing the post-Cold War world, with an emphasis on examining alternative conceptions of and approaches to such challenges.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: International Relations

PSCI 3155 (3) Survey Design and Analysis

Provides the unique experience of involvement in ongoing survey research. Designed for students from different disciplines who will learn about what makes a good versus bad survey, how to write effective questions and how to put survey questions together into a cohesive questionnaire. Gain insight into the pitfalls of survey research and how to overcome them. Provides hands-on, real world experience on the design, implementation and analysis of the annual Colorado Political Climate survey.

Requisites: Requires prerequisite course of PSCI 2075 (minimum grade C-).

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 3163 (3) American Foreign Policy

Examines foundations, assumptions, objectives, dynamics, and methods of U.S. foreign policy since WWII. Gives special attention to domestic and external problems of adapting U.S. policy to the changing world environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: International Relations

PSCI 3174 (3) Sex, Power, and Politics: U.S. Perspectives

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted, and changed by studying the politics of the women's, gay liberation, and men's movements in the U.S.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3174

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

Additional Information: Departmental Category: Political Theory

PSCI 3191 (3) National Security Organization and Policy Making

Analyzes how the American governmental and political system is structured to define, select, and implement national security policies. Examines roles of the president, Congress, bureaucracy, interest groups, and other actors.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3193 (3) International Behavior

Presents alternate theoretical frameworks for the explanation of international processes. Applies theories of conflict behavior and social organization to problems of war and peace.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 3205 (3) Undergrad Research Fellowship

Broadens and strengthens social science methodological skills and training by providing individualized instruction and research collaboration between the student and advanced graduate students and faculty. Promotes hands-on learning, immersion in the research process, and professional relationships with faculty. Includes a classroom component and a research opportunity in collaboration with a mentor.

Requisites: Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Political Science (PSCI) majors or minors only. Restricted to students with a cumulative GPA of 3.4 or higher.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 3206 (3) The Environment and Public Policy

Considers constitutional, political, and geographic factors in development of public policy affecting the use of natural resources and management of the environment; organization, procedures, and programs for use of natural resources; and administration of environmental policies.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101 or PSCI 2012.

Additional Information: Departmental Category: Public Policy

PSCI 3211 (3) The Politics of Economic Inequality in the United States

Explores empirical and normative origins and current state of economic inequality in the United States from a political science perspective. Evaluates how ideas about democracy and public policy address economic inequality, including the roles of gender, race and class in inequality. Examines the relationship between economic inequality and political inequality in both political behavior and political institutions.

Requisites: Requires a prerequisite course of PSCI 1101 (minimum grade D-).

Additional Information: Departmental Category: American

PSCI 3225 (3) Strategy and Politics

Focuses on the rational choice approach to understanding political decision making. Introduces students to the tools and methods of game-theoretic reasoning, and examines the strategic logic of many forms of political decision-making, including voting, lawmaking, and international conflict.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101 or PSCI or 2012 or PSCI 2223.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 3271 (3) Law and Society: Legal Institutions and Human Behavior

Examines relationship between human behavior and legal system, looking closely at the voluntary relationship between the citizen and the state, the use of law to balance economic liberty and equality, support for civil liberties, and procedural, distributive, and retributive justice.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3274 (3) Capitalism and its Critics

Examines competing theoretical approaches to questions related to origins, development, and purposes of modern government in the United States; particular attention paid to impact of transformations in the underlying structure of the capitalist economy. Formerly PSCI 3171.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Political Theory

PSCI 3281 (3) Development of American Political Institutions

Learn about the evolution of major American political institutions including the presidency, Congress, the judiciary, the party system and the right to vote.

Grading Basis: Letter Grade

Additional Information: Departmental Category: American

PSCI 3301 (3) Gender, Sexuality and U.S. Law

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; and discrimination based on sex and sexual orientation in education and in the workplace.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3300

Recommended: Prerequisite PSCI 1101 or WGST 2000.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American

PSCI 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office, and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation, and other identities in U.S. politics.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3311

Additional Information: Departmental Category: American

PSCI 3774 (3) Free Speech and Dangerous Ideas

Examines in depth various philosophical and legal justifications of First Amendment rights of speech, press, association and religion. Assesses these justifications in relation to broader normative theories of liberal democracy. Can also be taken for American field credit. Formerly PSCI 4774.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites PSCI 2004 and PSCI 2481.

Additional Information: Departmental Category: Political Theory

PSCI 4002 (3) Western European Politics

Comparatively analyzes development of the political systems and processes of European democracies. Emphasizes contemporary institutions, decision making patterns, and policy issues. Special attention to challenges of welfare systems.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4012 (3) Global Development

Analyzes development theory, case studies in development strategies, and the problems and promises of development: specifically issues of gender, environment, labor, corruption and poverty. The primary focus is on explanations for variation in level of development over time and across countries.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4022 (3) Chinese Foreign Policy

History of China's external relations and theories of foreign policy decision making. Explores two vital bilateral relations (Sino-U.S. and Sino-Japanese) and several key issues (like Taiwan) in China's 21st century foreign policy.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 4024 (3) Senior Seminar in Political Theory

Intensively analyzes and discusses major theories and issues of both contemporary political thought and the history of political philosophy. The topic is announced by the instructor, but might include analysis of concepts (justice, human rights, democracy, etc.) or major theories. Emphasizes advanced discussion plus individual research.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4028 (3) Special Topics

Offers subjects not covered by existing courses. Offered when the department approves a special topic.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: General

PSCI 4052 (3) Chinese Politics

Explores the politics of 20th century China to speculate on China's future in the 21st century. Begins with an extensive look at the political history of the People's Republic, before turning to social, cultural, economic, and political issues today. Concludes with an examination of Chinese foreign policy, with a focus on Sino-American relations.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 4062 (3) East European Politics

Studies developments in the former Soviet satellites and Yugoslavia, their governmental organizations, and their relation to the former Soviet Union and the West.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4106 (3) Issues and Challenges in American Green Energy Policy

Explores growth of contemporary American green energy industry.

Explores different types of green energy policies and how government institutions and regularly arrangements affect the development of green energy policy.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 4131 (3) Latinos and the U.S. Political System

Examines the political status and activities of Mexican Americans and other Latino groups (Cuban Americans and Puerto Ricans) in the U.S. Also covers Latino political attitudes and behaviors; Latino efforts to influence the major national, state, and local institutions of the American government; and public policy concerns of Latinos.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American

PSCI 4173 (3) International Cooperation and Global Anarchy

Explores if and how countries cooperate in a world with no government. Investigates cooperation over a number of international issues, including peace and security, trade and development, climate change, human rights, and justice for victims of war crimes. Gives special attention to organizations including the United Nations, International Monetary Fund, European Union and World Trade Organization.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: International Relations

PSCI 4183 (3) International Law

Investigates the body of law that regulates relations between nation states and provides a framework for the solving of common problems. Explores its nature and effectiveness as well as its adaptability to a changing environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4193 (3) International Political Economy

Analyzes issues at the intersection of international politics and international economics. Utilizes theories and concepts from both economics and political science to understand issues in trade, finance, development and migration.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4213 (3) Europe and the International System

Covers the past, present and future of Europe's global role.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4221 (3) Political Psychology

Examines the psychological foundations of political decision-making among citizens and elites. Considers the role of political psychology in explaining political behavior and outcomes at the individual and collective level.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4241 (3) Constitutional Law

Focuses on the nature and scope of American constitutional principles as developed by the U.S. Supreme Court, including federalism, separation of powers, commerce, due process and equal protection.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4242 (3) Middle Eastern Politics

Explores the domestic politics of various Middle Eastern countries as well as the development and globalization of the region. Includes topics such as the ongoing prevalence of dictatorships, political Islamism, oil politics, economic growth and stagnation, and relations with the U.S.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 4243 (3) Modern Warfare: Terrorism, Ideology, Identity

Explores the evolution of warfare and origins of terrorism. Ideological and identity differences have come to the forefront of violent political conflicts while the emerging doctrine of warfare has placed civilians in the middle of modern conflicts. Tracks potential changes in the means of and reasons for fighting, roles of civilians and media, and rules of war.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites PSCI 2223 and PSCI 3193.

Additional Information: Departmental Category: International Relations

PSCI 4252 (3) Politics of Ethnicity and Nationalism

Analyzes ethnic identity as a factor in contemporary politics. Deals extensively with the role of ethnic groups in political mobilization, the development of national collective consciousness, nation building, and international relations. Explores the influence of religion, language, history, culture and class on ethnic group formation and behavior.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 4253 (3) Politics of Identity and Inter-Ethnic Violence

Discusses politics of identity and why identity is such a potent source of violence. Is inter-ethnic conflict an end in itself, or are ethnic groups trying to achieve other goals through violence? What can be done to prevent or ameliorate inter-ethnic strife? Examines theoretical aspects of identity, inter-ethnic conflict, as well as specific examples of ethnic crises.

Recommended: Prerequisite PSCI 2223 or PSCI 2012.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Relations

PSCI 4283 (3) International Migration and Policy

Explores the politics of international migration, including public attitudes toward immigration, special interests politics of immigration policy making and the dynamics between political institutions and international migrations. Students will learn about the politics of international migration across different receiving and sending states over the past two centuries with an emphasis on the current debates over immigration in the U.S. and Western Europe.

Additional Information: Departmental Category: International Relations

PSCI 4302 (3) European Union Politics

Explores the development, functioning, focus and future of the European Union. Examines history, institutions, policies and politics as well as governance theories that have been developed to explain origins and evolution of the EU.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 4341 (3) Media and Politics

Examines aspects of political communication as it applies to citizens, political decision makers, and specific public policies.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4391 (3) Gender Politics and Global Activism

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional, and global levels.

Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4500

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Departmental Category: American

PSCI 4701 (3) Symbolic Politics

Introduces uses and abuses of symbols as instruments and indicators of political change.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4703 (3) Alternative World Futures

Aims to help students think about the future of the world in a systematic way. Focuses on alternative projections and policies dealing with major problems.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4714 (3) Liberalism and Its Critics

Examines contemporary arguments for and against liberalism. Focuses on the analysis, evaluation, and understanding of the philosophical contributions to this debate. Gives special attention to the concepts of justice, freedom, equality, and individualism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4715 (3) Honors Political Science Seminar

Involves writing and discussion of selected topics in political science. Critically reviews the major methodological and conceptual features of the discipline. Students begin their honors papers in the seminar. Department enforced prerequisite: minimum 3.3 GPA. Generally offered in fall term only.

Additional Information: Arts Sciences Honors Course

Departmental Category: Empirical Theory and Research Methodology

PSCI 4716 (3) Selected Policy Problems

Integrates general principles of policy inquiry with documents and other literature on specific problems in public policy, in order to evaluate courses of action.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Public Policy

PSCI 4725 (3) Political Science Honors Thesis

Involves writing an honors thesis. Formerly PSCI 4008.

Requisites: Requires prerequisite course of PSCI 4715 (minimum grade B-).

Additional Information: Arts Sciences Honors Course

Departmental Category: Empirical Theory and Research Methodology

PSCI 4731 (3) Civic Engagement in America

Closely examines the various understandings of democracy, the arguments for and against democracy, and the progress of and prospects for democratic politics in the United States. Particular attention is paid to economic, social, and political developments in the United States that affect popular sovereignty, political equality, and liberty.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4732 (3) Critical Thinking in Development

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade and democratization.

Equivalent - Duplicate Degree Credit Not Granted: INVS 4302

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies

Departmental Category: Comparative

PSCI 4734 (3) Politics and Literature

Broadly examines political topics as they are presented in important literary works and analyzes the possibilities involved in using the literary mode to present political teachings.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4751 (3) The Politics of Ideas

Examines theoretical arguments and case studies of interactions of ideas, interests, and institutions in policymaking. Analyzes processes through which ideas come to the public agenda, how institutional settings shape those ideas, and why some ideas and interests are more successful.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4771 (3) Civil Rights and Liberties in America

Implementation of rights and liberties in America. Examines fundamental issues of free speech, press, association, and religion along with rights to due process and equal protection under the law.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American

PSCI 4783 (3) Global Issues

Studies the principal issues confronting humanity that affect stability and survivability and their economic, social, and political implications.

Requisites: Restricted to Political Science (PSCI), International Affairs (IAFS) or Environmental Studies (ENVS) majors only.

Recommended: Prerequisite PSCI 2012 or PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4792 (3) Issues in Latin American Politics

Studies several Latin American countries in some depth including history and contemporary politics. Teaches students to listen to and evaluate different sides of political controversies, and critically evaluate arguments.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 4841 (1-3) Independent Study in American Politics

Subjects are chosen and arrangements are made to suit the needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. A special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4842 (1-3) Independent Study in Comparative Politics

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative

PSCI 4843 (1-3) Independent Study in International Relations

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4844 (1-3) Independent Study in Political Theory

Subjects and arrangements suit individual student needs. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4846 (1-3) Independent Study in Public Policy

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 4848 (1-3) Independent Study

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSCI 4938 (3-6) Internship in Government

With instructor's assistance, students secure an internship with a political or governmental organization. In addition to the internship, the class consists of regular seminars, course readings and assignments, and individual conferences with the instructor. Student pursues an academic research project and writes an original research paper. Instructor approval required in semester preceding internship. Contact instructor prior to early registration.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: General

Political Science - Bachelor of Arts

A degree in political science provides students with knowledge and understanding of political issues and prepares them for a career in fields such as:

- Civil service
- Journalism
- Management
- Politics
- Legislative analysis
- Criminology
- City planning
- Population studies

Students can combine the major with teaching credentials and teach government, political science and civics in secondary schools. If a student plans to go on to the graduate level, the political science major provides excellent background for law school or graduate school in political science, sociology, economics or a number of other social science disciplines.

Career Services (<http://www.colorado.edu/career>) offers a number of programs and services designed to help students plan their career, including workshops, internships and placement services after graduation.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. Total credit hours required in Political Science courses: 42 credit hours.

No courses for the PSCI major may be taken pass/fail, and a student must have a grade of C- or better in all 42 required credit hours in political science, and a cumulative GPA of 2.0 or better in political science courses.

No more than 45 credit hours in political science credit will count toward the Arts and Sciences graduation requirement of 120 credit hours. This may be exceeded by 6 credit hours (for a total of 51 credit hours), provided that the excess credit hours are taken in PSCI 4715 and PSCI 4725 (honors thesis credit).

Required Courses and Credit Hours

Lower Division Distribution

PSCI 1101	Introduction to American Politics	3
PSCI 2012	Introduction to Comparative Politics	3
PSCI 2223	Introduction to International Relations	3
PSCI 2004	Survey of Western Political Thought	3

Empirical Theory and Research Methodology

PSCI 2075	Quantitative Research Methods	3
PSCI 3105	Designing Social Inquiry: An Introduction to Analyzing Political Phenomena	3

Upper Division Distribution

Select one course in four of the following six primary fields: 12

American		
Comparative		
International Relations		
Political Theory		
Empirical Theory and Research Methodology ¹		
Public Policy		

Political Science Electives

Three upper division PSCI elective courses	9
One lower or upper division PSCI elective course	3
Total Credit Hours	42

¹ Note that PSCI 3105 does not count towards the upper division distribution requirement for the Empirical Theory and Research Methodology field.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only

refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in political science, students should meet the following requirements:

- By the end of the second semester, declare the major.
- By the end of the third semester, complete PSCI 1101 and two of the following required courses: PSCI 2012, PSCI 2223, PSCI 2004 or PSCI 2075.
- By the end of the fourth semester, complete the remaining lower-division political science courses.
- By the end of the sixth semester, complete 12 upper-division credit hours of political science courses, including at least one course in three of the following fields: American, comparative, international relations, methodology, policy and theory. In addition, complete three upper-division or lower-division political science elective credit hours.
- During the seventh and eighth semesters, complete 12 credit hours of political science courses, including at least 9 upper-division political science elective credit hours and all remaining upper-division field distribution requirements.

Course	Title	Credit Hours
Year One		
Fall Semester		
PSCI 1101	Introduction to American Politics	3
PSCI 2012 or PSCI 2223	Introduction to Comparative Politics or Introduction to International Relations	3
		Credit Hours 6
Spring Semester		
PSCI 2223 or PSCI 2012	Introduction to International Relations or Introduction to Comparative Politics	3
PSCI 2004	Survey of Western Political Thought	3
		Credit Hours 6
Year Two		
Fall Semester		
PSCI 2075	Quantitative Research Methods	3
PSCI Required Upper-Division course (Four Area courses required)		3
		Credit Hours 6

Spring Semester

PSCI 3105	Designing Social Inquiry: An Introduction to Analyzing Political Phenomena	3
	Credit Hours	3

Year Three**Fall Semester**

PSCI Required Upper-Division course (Four Area courses required)		3
PSCI Required Upper-Division course (Four Area courses required)		3
	Credit Hours	6

Spring Semester

PSCI Required Upper-Division course (Four Area courses required)		3
PSCI Required Upper-Division Elective (Twelve elective credits required)		3
	Credit Hours	6

Year Four**Fall Semester**

PSCI Upper-Division Elective (Twelve elective credits required)		3
PSCI Upper-Division Elective (Twelve elective credits required)		3
	Credit Hours	6

Spring Semester

PSCI Elective (Twelve elective credits required)		3
	Credit Hours	3
	Total Credit Hours	42

Political Science - Minor

A minor in political science provides students with knowledge and understanding of political issues and prepares them for a career in fields such as:

- Civil service
- Journalism
- Management
- Politics
- Legislative analysis
- Criminology
- City planning
- Population studies

Students can combine the minor with teaching credentials and study in an affiliated field to teach government, political science and civics in secondary schools. If a student plans to go on to the graduate level, the political science minor provides an excellent complement to other fields as preparation for law school or graduate school in political science, sociology, economics or a number of other social science disciplines.

Career Services (<http://www.colorado.edu/career>) offers a number of programs and services designed to help students plan their career, including workshops, internships and placement services after graduation.

Requirements

Declaration of a minor in political science is open to any student enrolled at CU Boulder, regardless of college or school.

Students must complete 21 credit hours of political science to complete the political science minor, of which 9 credit hours must be in upper-division course work. All 21 credit hours must be completed with grades of C- or better and an overall GPA of 2.00. None of the required credit hours may be taken pass/fail.

Required Courses and Semester Credit Hours

Lower-Division Courses

PSCI 1101	Introduction to American Politics	3
Select two of the following:		6
PSCI 2012	Introduction to Comparative Politics	
PSCI 2223	Introduction to International Relations	
PSCI 2004	Survey of Western Political Thought	
PSCI 2075	Quantitative Research Methods	

Upper-Division Courses

9 credit hours in a minimum of two of the following primary fields: ¹ 9

American
Comparative
International Relations
Political Theory
Empirical Theory and Research Methodology
Public Policy

Lower- or Upper-Division Political Science

3 credit hours of lower- or upper-division political science	3
Total Credit Hours	21

¹ PSCI 4938 will not fulfill a primary field area in the minor.

International Affairs Majors

International affairs majors who wish to minor in political science must apply the following additional rules:

- No more than 9 credit hours toward the PSCI minor can come from courses that count toward another major.
- International affairs majors must take at least one upper-division course in American politics and one course (lower- or upper-division) in political theory, in addition to the regular minor requirements.

Psychology and Neuroscience

At the undergraduate level, this department offers a major in psychology and a major and a certificate in neurosciences. Psychology is a broad discipline that seeks to understand human cognition, emotion and behavior. It is also an applied field that is concerned with testing perception, psychopathology, inheritance of complex behavioral traits, mental health, memory and social factors that influence behavior.

Neuroscience is the study of the mechanisms of nervous system—the brain, the spinal cord and networks of sensory nerve cells, or neurons. Neuroscientists work to describe how neural circuits transmit signals and process different types of information. The principles of neuroscience are derived from the application of methods from many scientific disciplines,

including molecular and cellular biology, biochemistry, physiology, structure and computational modeling.

Students contemplating postgraduate education, either in professional or in graduate school, are encouraged to participate in the departmental honors program, which provides special opportunities for individualized attention.

CU Boulder's Department of Psychology and Neuroscience has been ranked by the National Academy of Sciences as one of the best in the country with respect to the quality of the faculty and their scholarly productivity. Moreover, the department offers undergraduates a wide range of opportunities for involvement in research.

Course codes for this program are PSYC and NRSC.

Bachelor's Degrees

- Neuroscience - Bachelor of Arts (BA) (p. 476)
- Psychology - Bachelor of Arts (BA) (p. 479)

Certificate

- Neurosciences - Certificate (p. 479)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Allen, David Lehigh (https://experts.colorado.edu/display/fisid_114466)
Senior Instructor; PhD, University of California-Los Angeles

Alpern, Herbert P.
Professor Emeritus

Arch, Joanna Jennifer (https://experts.colorado.edu/display/fisid_147415)
Assistant Professor; PhD, University of California-Los Angeles

Bachtell, Ryan Karn (https://experts.colorado.edu/display/fisid_146084)
Associate Professor; PhD, Oregon Health Science University

Banich, Marie (https://experts.colorado.edu/display/fisid_120646)
Professor; PhD, University of Chicago

Barrientos-Wood, Ruth M (https://experts.colorado.edu/display/fisid_117816)
Asst Research Professor; PhD, George Washington University

Barth, Daniel (https://experts.colorado.edu/display/fisid_100820)
Professor; PhD, University of California-Los Angeles

Bernard, Jessica (https://experts.colorado.edu/display/fisid_153711)
Asst Professor Adjunct

Berta, Joseph E (https://experts.colorado.edu/display/fisid_101962)
Senior Instructor; PhD, University of Colorado Boulder

Bidwell Kovalev, Lorna Cinnamon (https://experts.colorado.edu/display/fisid_155117)
Asst Research Professor; PhD, University of Colorado Boulder

Blair, Irene Verna (https://experts.colorado.edu/display/fisid_107261)
Professor; PhD, Yale University

Blechman, Elaine A.
Professor Emeritus

Bloom, Bernard L.
Professor Emeritus

Bourne, Lyle E. Jr
Professor Emeritus

Bryan, Angela (https://experts.colorado.edu/display/fisid_115216)
Professor; PhD, Arizona State University

Campeau, Serge (https://experts.colorado.edu/display/fisid_115395)
Professor; PhD, Yale University

Carey, Gregory (https://experts.colorado.edu/display/fisid_101322)
Associate Professor; PhD, University of Minnesota Twin Cities

Carter Carston, Ronald McKell (https://experts.colorado.edu/display/fisid_154921)
Assistant Professor; PhD, California Institute of Technology

Cartwright, Desmond S.
Professor Emeritus

Collins, Allan C.
Professor Emeritus

Colunga, Eliana (https://experts.colorado.edu/display/fisid_129477)
Associate Professor; PhD, Indiana University Bloomington

Correll, Joshua Raphael (https://experts.colorado.edu/display/fisid_151728)
Associate Professor; PhD, University of Colorado Boulder

Curran, Timothy (https://experts.colorado.edu/display/fisid_118454)
Professor; PhD, University of Oregon

Day, Heidi E W (https://experts.colorado.edu/display/fisid_116632)
Senior Instructor; PhD, University of Cambridge (England)

DeFries, John C.
Professor Emeritus

Dimidjian, Sona Armine (https://experts.colorado.edu/display/fisid_140084)
Associate Professor; PhD, University of Washington

Forward, John R.
Professor Emeritus

Friedman, Naomi P (https://experts.colorado.edu/display/fisid_109519)
Assistant Professor; PhD, University of Colorado Boulder

Gruber, June L (https://experts.colorado.edu/display/fisid_153634)
Assistant Professor; PhD, University of California-Berkeley

Harvey, Lewis Orvis (https://experts.colorado.edu/display/fisid_101173)
Professor; PhD, Pennsylvania State University

Healy, Alice F (https://experts.colorado.edu/display/fisid_100418)
Professor; PhD, Rockefeller University

Hernandez, Theresa D (https://experts.colorado.edu/display/fisid_102953)
Professor; PhD, University of Texas at Austin

Hewitt, John K (https://experts.colorado.edu/display/fisid_101035)
Professor; PhD, University of London (England)

Hutchison, Kent Edward (https://experts.colorado.edu/display/fisid_113101)
Professor; PhD, Oklahoma State University

Ito, Tiffany Anne (https://experts.colorado.edu/display/fisid_113066)
Professor; PhD, University of Southern California

Jessor, Richard
Professor Emeritus

Jones, Matthew Carl (https://experts.colorado.edu/display/fisid_144611)
Associate Professor; PhD, University of Michigan Ann Arbor

Judd, Charles M (https://experts.colorado.edu/display/fisid_101853)
Professor; PhD, Columbia University In the City of New York

Kaufmann, Vyga G. (https://experts.colorado.edu/display/fisid_151089)
Instructor

Keller, Matthew C (https://experts.colorado.edu/display/fisid_144507)
Associate Professor; PhD, University of Michigan Ann Arbor

Kim, Albert E. (https://experts.colorado.edu/display/fisid_143740)
Associate Professor; PhD, University of Pennsylvania

King, D Brett (https://experts.colorado.edu/display/fisid_103815)
Senior Instructor; PhD, Colorado State University

Kintsch, Walter
Professor Emeritus

LeBourgeois, Monique Katherine (https://experts.colorado.edu/display/fisid_148411)
Assistant Professor; PhD, University of Southern Mississippi

Loersch, Christopher Alan (https://experts.colorado.edu/display/fisid_149841)
Assistant Professor; PhD, Ohio State University

Maier, Steven F (https://experts.colorado.edu/display/fisid_100482)
Distinguished Professor; PhD, University of Pennsylvania

McClelland, Gary H.
Professor Emeritus

McGraw, Albert Peter (https://experts.colorado.edu/display/fisid_133262)
Associate Professor; PhD, Ohio State University

Michl, Josef (https://experts.colorado.edu/display/fisid_102977)
Professor Attendant Rank; PhD, Czech Academy of Sciences, Prague (Czech Republic)

Miklowitz, David J (https://experts.colorado.edu/display/fisid_105771)
Professor Adjunct; PhD, University of California-Los Angeles

Mittal, Vijay (https://experts.colorado.edu/display/fisid_148386)
Asst Professor Adjunct; PhD, Emory University

Miyake, Akira (https://experts.colorado.edu/display/fisid_107321)
Professor; PhD, Carnegie Mellon University

Munakata, Yuko (https://experts.colorado.edu/display/fisid_125036)
Professor; PhD, Carnegie Mellon University

O'Reilly, Randall Charles (https://experts.colorado.edu/display/fisid_110512)
Professor; PhD, Carnegie Mellon University

Olson, Richard Kellogg (https://experts.colorado.edu/display/fisid_103121)
Professor; PhD, University of Oregon

Park, Bernadette (https://experts.colorado.edu/display/fisid_103732)
Professor; PhD, Northwestern University

Pittman-Wagers, Justina (https://experts.colorado.edu/display/fisid_117148)
Senior Instructor; PsyD, University of Denver

Polson, Peter G.
Professor Emeritus

Ramirez, Albert
Professor Emeritus

Rhee, Soo H (https://experts.colorado.edu/display/fisid_123401)
Associate Professor; PhD, Emory University

Richardson, Emily (https://experts.colorado.edu/display/fisid_115007)
Asst Research Professor; PhD, University of Iowa

Rudy, Jerry W (https://experts.colorado.edu/display/fisid_101550)
Professor; PhD, University of Virginia

Saddoris, Michael Paul (https://experts.colorado.edu/display/fisid_152979)
Assistant Professor; PhD, Johns Hopkins University

Sasnett-Martichuski, Diane Kay (https://experts.colorado.edu/display/fisid_111599)
Senior Instructor; PhD, Colorado State University

Sharpless, Seth K.
Professor Emeritus

Spencer, Robert L (https://experts.colorado.edu/display/fisid_104362)
Professor; PhD, University of Arizona

Stallings, Michael C (https://experts.colorado.edu/display/fisid_108745)
Professor; PhD, University of Southern California

Taylor, Ronald G.
Professor Emeritus

Thomas, David R.
Professor Emeritus

Urland, Geoffrey Raymond (https://experts.colorado.edu/display/fisid_151086)
Lecturer

Van Boven, Leaf D (https://experts.colorado.edu/display/fisid_126291)
Professor; PhD, Cornell University

Vigers, Alison Jane (https://experts.colorado.edu/display/fisid_142378)
Instructor

Vrieze, Scott Ian (https://experts.colorado.edu/display/fisid_153059)
Assistant Professor; PhD, University of Minnesota Central office

Wager, Tor Dessart (https://experts.colorado.edu/display/fisid_147666)
Professor; PhD, University of Michigan Ann Arbor

Watkins, Linda R (https://experts.colorado.edu/display/fisid_101513)
Distinguished Professor; PhD, Virginia Commonwealth University

Weatherley, Donald A.
Professor Emeritus

Wehner, Jeanne M.
Professor Emeritus

Wertheimer, Michael
Professor Emeritus

Whisman, Mark (https://experts.colorado.edu/display/fisid_113391)
Professor; PhD, University of Washington

Willcutt, Erik G (https://experts.colorado.edu/display/fisid_113861)
Professor; PhD, University of Denver

Wilson, James R.
Professor Emeritus

NRSC 2100 (4) Introduction to Neuroscience

Provides an introduction to fundamental concepts in neuroscience. The goal of this first course is to provide a strong foundation in neurobiology-cell biology, physiology of the neuronal membrane, interneuronal communication, neurotransmission, gross anatomy, and how the brain develops. Students will also learn principles of sensory systems functions. Recitation will reinforce lecture concepts through discussion of current research.

Requisites: Requires prerequisite courses of MCDB 1150 or EBIO 1210 (minimum grade C-).

NRSC 2101 (1-4) Topics in Neuroscience

Provides students with the opportunity to focus on a specific area of Neuroscience in depth. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

NRSC 2200 (2) Laboratory Techniques in Neuroscience

Introduces students to many basic and essential laboratory skills in neuroscience research. Students will learn experimental methods and perform experiments depicting principles in neurophysiology, neuroanatomy, neurochemistry, and the fundamentals of neuroimaging techniques.

Requisites: Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

NRSC 4011 (1-3) Senior Thesis

Critically reviews topics in neuroscience research, scholarly analysis of a major neuroscience issue, and/or empirical research project. See the neuroscience director for further information.

NRSC 4015 (3) Affective Neuroscience

Experiencing and learning from affect–emotional value–is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5015

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

NRSC 4032 (3) Neurobiology of Learning and Memory

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5032

Requisites: Requires a prerequisite course of PSYC 2012 or PSYC 4052 or NRSC 2100 or NRSC 4052 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Biological

NRSC 4052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5052 and PSYC 4052 and PSYC 5052

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following sequences EBIO 1210 and EBIO 1220 or CHEM 1113 and CHEM 1133 or PHYS 1010 and 1020 or PHYS 2010 and PHYS 2020 (all minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4062 (3) The Neurobiology of Stress

Provides an introduction to the concept of stress and the physiological systems involved. Factors modulating stress vulnerability versus resilience, and stress interactions with other systems with health relevance will be explored. Emphasis will be placed on current research on brain mechanisms. Formerly PSYC 4062.

Requisites: Requires prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

Recommended: Prerequisite a strong foundation and interest in biological psychology, neuroscience, and physiology.

Additional Information: Departmental Category: Biological

NRSC 4072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5072

Requisites: Requires a prerequisite course of PSYC 2012 or PSYC 4052 or NRSC 2100 or NRSC 4052 and one of the following sequences of courses: EBIO 1210 and 1220 or MCDB 1150 and 2150 or MCDB 1150 and EBIO 1220 or EBIO 1210 and MCDB 2150 (all minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4082 (3) Neural Circuits of Learning and Decision Making

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5082

Requisites: Requires prerequisite course of NRSC 2100 or NRSC 4052 (minimum grade C-).

Grading Basis: Letter Grade

NRSC 4092 (3) Behavioral Neuroendocrinology

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5092

Requisites: Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

Additional Information: Departmental Category: Biological

NRSC 4132 (3) Neuropharmacology

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5132

Requisites: Requires a prerequisite course of NRSC 2100 (minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4155 (4) Cognitive Neuroscience/Neuropsychology

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4155

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following: PSYC 2111 or MATH 2510 or IPHY 2800 or EBIO 1010 or BCOR 1020 or ECON 3818 (all minimum grade C-).

NRSC 4542 (3) The Neurobiology of Mental Illness

Provides in depth study of what is known concerning the neurobiology of mental illnesses, with a focus on depression and anxiety. Consideration will be given to both animal models and human work, with neurochemical, circuitry level, and neuroinflammatory processes to be highlighted. There will be discussion of the intricacies of determining the effectiveness of pharmacological treatments, and what the implications of such treatments might be.

Requisites: Requires prerequisite courses of PSYC 2012 or NRSC 2100 and one of the following: PSYC 4052 or NRSC 4052 or NRSC 4132 or NRSC 4082 or NRSC 4092 or NRSC 4032 (all minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4545 (3) Neurobiology of Addiction

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction. Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5545

Requisites: Requires prerequisite courses of NRSC 4132 (minimum grade C-).

NRSC 4561 (2-3) Special Topics in Neuroscience

Presents and analyzes special interest topics from the broad and interdisciplinary field of neuroscience. The instructor determines the content of a particular section. Repeatable for up to 6.00 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

NRSC 4841 (1-3) Independent Study in Neuroscience

Pass/Fail only.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Neuroscience (NRSC) majors only.

Grading Basis: Pass/Fail

NRSC 4911 (3) Teaching of Neuroscience

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5911

PSYC 1001 (3) General Psychology

Surveys major topics in psychology: perceptions, development, personality, learning and memory, and biological bases of behavior. Students may participate as subjects for several hours in ongoing research.

Additional Information: Departmental Category: General
MAPS Course: Social Science

PSYC 2012 (3) Biological Psychology

Surveys biological bases of learning, motivation, emotion, sensory processes and perception, movement, comparative animal behavior, sexual and reproductive activity, instinctual behavior, neurobiology of language and thought, and neurophysiology and neuroanatomy in relation to behavior.

Recommended: Prerequisite PSYC 1001.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Biological

PSYC 2111 (4) Psychological Science I: Statistics

Three hours of lecture and one two-hour lab per week. Introduces descriptive and inferential statistics and their roles in psychological research. Topics include correlation, regression, T-test, analysis of variance and selected nonparametric statistics.

Requisites: Requires prerequisite course of MATH 1011 or MATH 1071 or MATH 1081 or MATH 1150 or MATH 1212 or MATH 1300 (minimum grade C-).

Additional Information: Departmental Category: General

PSYC 2145 (3) Introductory Cognitive Psychology

Introduces the study of human cognitive processes and covers perception, attention, memory, language, problem solving, reasoning, and decision making. Focuses on basic research and theory in cognitive psychology but also considers their implications for everyday applications such as effective learning and retention, multitasking, and eyewitness testimony.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 2606 (3) Social Psychology

Covers general psychological principles underlying social behavior. Analyzes major social psychological theories, methods, and topics, including attitudes, conformity, aggression, attraction, social perception, helping behavior, and group relations.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Social

PSYC 2643 (3) Child and Adolescent Psychology

Surveys major psychological processes of childhood and adolescence.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: Departmental Category: Clinical

PSYC 2700 (3) Psychology of Gender and Sexuality

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2700

Requisites: Requires a prerequisite course of PSYC 1001 or WGST 2000 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General

PSYC 3001 (4) Honors Research Methods Seminar

Focuses on research design. Each student prepares an original, detailed research proposal, which can become the honors thesis. Open only to students who have been accepted into the psychology departmental honors program. Instructor consent required.

Additional Information: Arts Sciences Honors Course
Departmental Category: General

PSYC 3005 (3) Cognitive Science

Provides an introductory survey of influential models, theoretical approaches, and methods of cognitive science. Emphasizes and explains the convergence by work in multiple fields - including psychology and neuroscience, linguistics, computer science, and philosophy - on the idea that mental activity is a form of computation. Students from diverse backgrounds are introduced to a wide range of methods and approaches, including behavioral and neuroimaging experimental approaches, computational modeling and philosophical work. Department enforced prerequisites: two of the following CSCI 1300 or LING 2000 or PSYC 2145.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and LING 3005 and PHIL 3310 and SLHS 3003

Additional Information: Departmental Category: Experimental

PSYC 3102 (3) Behavioral Genetics

Introduces the basic principles of genetics, covers how these principles can be used in the study of behavior, and evaluates the evidence for genetic influences on behavioral characteristics.

Additional Information: Departmental Category: Biological

PSYC 3105 (3) Experimental Methods in Psychology

Provides an introduction to the use of experimental procedures in psychology. Students learn about the logic and design of experiments, the meaning of psychological data, how to analyze and interpret data, and the role of theory in psychology.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 (minimum grade C-).

Recommended: Prerequisite PSYC 2145.

Additional Information: Departmental Category: Experimental

PSYC 3111 (4) Psychological Science 2: Research Methods in Psychology

Provides a foundation in research methodology to give students the ability to design, conduct, analyze, and present (both verbally and in writing) an empirical study in psychology. Allows students to be effective producers and consumers of research.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

PSYC 3112 (3) Behavioral Genetics II

Follows PSYC 3102, Behavior Genetics, and surveys recent developments in behavior genetics, including recent genotyping and sequencing technologies, statistical approaches, and epigenetics.

Requisites: Requires a prerequisite course of PSYC 3102 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Biological

PSYC 3131 (3) Human Emotion

Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of anger, love and disgust; emotion and morality; cultural and gender differences; emotion and the brain; relation between emotion and thinking; development of emotion; and abnormal emotions in mental illness.

Recommended: Prerequisite PSYC 1001.

Additional Information: Departmental Category: General

PSYC 3303 (3) Abnormal Psychology

Examines etiological, theoretical, clinical, diagnostic, and experimental perspectives of major mental health disorders, with an emphasis on the main symptoms and diagnostic criteria associated with these disorders.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: Departmental Category: Clinical

PSYC 3456 (3) Psychology of Personality

Offers a psychological study of structure, organization and development of the person as a whole. Analysis of major theories, methods and research, including topics such as emotion, motivation, temperament, inner experience, identity and the self, personality change and the influence of sociocultural context.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Social

PSYC 3511 (3) History of Psychology

Includes outline of development of psychological theories since the Greek philosophers, the story of experimental psychology and its problems, and schools of psychological thinking. Students read original sources in English and English translations. Formerly PSYC 4511.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General

PSYC 3684 (3) Developmental Psychology

In-depth consideration of human developmental processes across the life span. Includes coverage of the major topics in human development, such as physical, cognitive, social, emotional, and moral development.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites PSYC 1001 and PSYC 2111 and PSYC 3111.

Additional Information: Departmental Category: Developmental

PSYC 4001 (3) Honors Seminar 2

Surveys contemporary issues, explores current controversies, and examines in detail selected topics in psychology. Open to juniors and seniors pursuing departmental honors.

Additional Information: Arts Sciences Honors Course

Departmental Category: General

PSYC 4011 (1-3) Senior Thesis

Critically reviews some aspect of psychological literature, scholarly analysis of a major psychological issue, and/or empirical research project. See the psychology honors director for further information.

Additional Information: Departmental Category: General

PSYC 4021 (3) Psychology and Neuroscience of Exercise

Explores social, cognitive, psychobiological and behavioral aspects of exercise and other forms of physical activity. Examines how psychological and neuroscience research have been used to study how participation in regular physical activity affects mental health and how psychological and other variables influence participation in, adherence to, enjoyment of, and consequences of exercise and physical activity.

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General

PSYC 4052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5052 and NRSC 4052 and NRSC 5052

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following sequences EBIO 1210 and EBIO 1220 or CHEM 1113 and CHEM 1133 or PHYS 1010 and 1020 or PHYS 2010 and PHYS 2020 (all minimum grade C-).

Additional Information: Departmental Category: Biological

PSYC 4114 (3) Educational Psychology and Adolescent Development

Examines the principles of educational and adolescent psychology and development that play a significant role in analyzing and understanding the complex processes in middle and secondary school classrooms. Course has both theoretical and practical dimensions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4112

Additional Information: Departmental Category: Developmental

PSYC 4136 (4) Judgment and Decision Making

Introduces the study of judgment and decision making processes (estimation, prediction and diagnosis, choice under certainty, and risky decision making) and the methods that have been developed to improve these processes (statistical modeling, decision analysis, and expert systems).

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Social

PSYC 4142 (3) Brain Injury, Plasticity and Recovery: From Neuron to Behavior

Traumatic brain injury is prevalent in all aspects of society, with incidence rates varying according to age, gender, military affiliation and participation in certain sports. Delves into the full spectrum of consequences following injury, beginning with the individual neural cells in the brain through to the behaving individual. Covers strategies to improve functional recovery.

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

Recommended: Prerequisite NRSC 4132.

Additional Information: Departmental Category: Biological

PSYC 4145 (4) Advanced Cognitive Psychology

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5145

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2145 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4155 (4) Cognitive Neuroscience/Neuropsychology

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4155

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following: PSYC 2111 or MATH 2510 or IPHY 2800 or EBIO 1010 or BCOR 1020 or ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4165 (4) Psychology of Perception

One lab, three lect. per week. Analyzes peripheral and central mechanisms involved in the transduction and interpretation of experience. Gives special attention to vision and audition; major theories in these areas are discussed in terms of research they have inspired.

Requisites: Requires a prerequisite course of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4175 (4) Computational Cognitive Neuroscience

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5175

Requisites: Requires prereq of PSYC 1001 and PSYC 2012 or NRSC 2100 and PSYC 2111 or MATH 2510 or 2520 or IPHY 2800 or APPM 1710 or 2750 or CHEN 3010 or 3130 or ECON 3818 (min grad C-). Restricted to PSYC or NRSC majors with 57-180 credits only.

Additional Information: Departmental Category: Experimental

PSYC 4220 (3) Language and Mind

Studies topics such as speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

Equivalent - Duplicate Degree Credit Not Granted: LING 4220

Recommended: Prerequisites PSYC 1001 and LING 2000.

Additional Information: Departmental Category: General

PSYC 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

Equivalent - Duplicate Degree Credit Not Granted: LING 4225

Requisites: Requires a prerequisite course of PSYC 1001 or LING 2000 (minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Developmental

PSYC 4263 (3) Evidence-Based Practice in Mental Health: Science and Skills

Provides an intensive introduction to behavioral interventions for common mental health problems and the framework of evidence-based practice in psychology, including helping students to acquire, critically evaluate and communicate about clinical psychological science intervention research and become familiar with applied skills that are relevant to a broad range of clinical settings.

Requisites: Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-)

Grading Basis: Letter Grade

PSYC 4332 (1) Found in Translation: TBI From Bench to Bedside to Community

Traumatic Brain Injury (TBI) is prevalent in all aspects of society. Delves into all aspects of TBI, with particular emphasis on translational clinical neuroscience. That is, the movement of knowledge from bench, to bedside, to community. All of this knowledge resulting in better treatment of and outcome for those with TBI.

Requisites: Requires prerequisite courses of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 units (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Biological

PSYC 4376 (4) Research Methods in Social Psychology

Introduces the study of social psychological processes, emphasizing the social cognition perspective (e.g., stereotyping, person perception, theory of planned behavior) and the methods utilized in studying these processes. Students will complete research projects as part of the course.

Requisites: Requires prerequisite courses of PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Social

PSYC 4385 (3) Ethology and Comparative Psychology

Discusses behavior of representative members of each animal phylum. Emphasizes ontogeny of behavior as well as phylogeny.

Requisites: Requires a prerequisite course of PSYC 1001 or EBIO 1210 (minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4443 (4) Research Methods in Clinical Psychology

Learn to evaluate research methods as they relate to etiology, assessment, and intervention of psychological disorders. Emphasizes the importance of using sound methodological strategies in both research and clinical settings.

Requisites: Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) only.

Additional Information: Departmental Category: Clinical

PSYC 4521 (3) Critical Thinking in Psychology

Allows students to expand their powers as they think about psychological problems, or about how psychological knowledge and techniques can be applied to pressing political, economic, biological, quantitative and social issues. Encourages intellectual discipline and critical thinking about concepts and ideas; enables students to participate in oral and written discussion. May not be repeated, only 3 credit hours allowed.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Psychology (PSCY) majors only.

Additional Information: Departmental Category: General

PSYC 4526 (3) Social Neuroscience

Develops greater knowledge of the general psychological principles underlying social behavior by using methods and theories from neuroscience. Students learn about common methods in human neuroscience and how they can be applied to better understand social behavior.

Requisites: Requires prerequisite courses of PSYC 2012 and PSYC 2111 and PSYC 2606 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (junior or senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Social

PSYC 4541 (3) Special Topics in Psychology

Studies and analyzes special interest topics from the broad and diversified field of psychology. Particular section content is determined by instructor.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5541

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: General

PSYC 4543 (3) Clinical Neuropsychological Disorders

Neuropsychological disorders are behavioral and cognitive expressions of underlying brain diseases or injury. The course will provide in-depth coverage from clinical perspectives of wide range of disorders caused by stroke, traumatic brain injury, degenerative diseases, and inflammatory diseases. Students will learn the various neurologic, neuroimaging and neuropsychological methods for assessing and diagnosing these disorders and will review specific illustrative cases.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Clinical

PSYC 4553 (3) Women's Mental Health: A Biopsychosocial Approach

Provides a broad overview of current research and theory related to women's mental health, emphasizing topics and problems that are prevalent among or particularly relevant to women. Teaches students to develop a critical and integrative understanding women's mental health, including historical, social, cultural, biological, behavioral, cognitive and emotional factors.

Requisites: Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Clinical

PSYC 4560 (3) Language Development

Examines the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

Equivalent - Duplicate Degree Credit Not Granted: LING 4560 and SLHS 4560

Requisites: Restricted to Psychology (PSYC) or Neuroscience (NRSC) majors only.

Recommended: Prerequisites PSYC 1001 and LING 2000.

Additional Information: Departmental Category: General

PSYC 4606 (3) Advanced Topics in Social Psychology

In-depth study of selected topics in social psychology. Particular section content each semester is determined by the instructor. May be repeated for a maximum of 6 credit hours, provided the topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Social

PSYC 4713 (3) Survey of Clinical Psychology

Covers theories and practices relating to problems of ability and maladjustment. Diagnostic procedures and treatment methods with children and adults.

Requisites: Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Clinical

PSYC 4733 (4) Psychological Testing and Assessment

Provides an overview of issues central to testing and assessment of psychological constructs, including types of evaluation instruments currently in use in the field, their applications and design.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and 3111 (all minimum grade C-).

Additional Information: Departmental Category: Clinical

PSYC 4744 (4) Methods in Developmental Psychology

Learn to critically read and form hypotheses from studies in the developmental literature, gain hands-on experience in testing children and in the design of methods to test children, evaluate experimental data and relate them to hypotheses, previous results and theory, and write so others can understand.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 and PSYC 3684 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

PSYC 4841 (1-6) Independent Study (Upper Division)

Pass/fail only.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSYC 4911 (3) Teaching of Psychology

Students receive concrete experience in teaching general psychology under supervision of a psychology faculty member. Alternative pedagogical strategies are discussed. Students must submit an application to the undergraduate advising center.

Additional Information: Departmental Category: General

PSYC 4931 (3) Field Placement Internship

Offers valuable volunteer experience through a supervised field placement. Provides hands-on insight into the decisions and issues that confront professionals in psychology and related fields.

Requisites: Restricted to Psychology (PSYC) majors only.

Recommended: Prerequisite completion of 15 or more hours of psychology course work.

Additional Information: Departmental Category: General

Neuroscience - Bachelor of Arts (BA)

Our Neuroscience major provides a fundamental understanding of brain function that emerges from knowledge of the interplay of the molecular, cellular, and systems-level operation of the nervous system. Our distinguished faculty also teach excellent upper division courses in areas of expertise that include, but are not limited to, learning and memory, addiction, mental illness, stress, neuroendocrinology, neuropharmacology, and behavioral neuroscience.

Requirements

Prerequisites

It is policy to enforce the course prerequisites listed in the course descriptions. If you have not either taken and passed (C- or better) the prerequisites for a course, or obtained permission from the instructor or a departmental advisor to take the course based on equivalent preparatory course work or experience here or elsewhere, you may be administratively dropped from the course.

Degree Requirements

The neuroscience major requires at least 55 credit hours of course work.

Students must complete the general requirements of the College of Arts and Sciences and the requirements listed below. Students must fulfill all of the following requirements with a grade of C- or better. Additional

explanatory notes are available in the department advising office, Muenzinger D260.

The department recommends taking NRSC 2100 and NRSC 2200, the genetics and statistics requirements and the ancillary biology, chemistry and calculus sequences during the first two years of study.

Required Courses and Credit Hours

Required Courses

NRSC 2100	Introduction to Neuroscience	4
NRSC 2200	Laboratory Techniques in Neuroscience	2
Select one of the following genetics courses: ¹		4-6
EBIO 2070	Genetics: Molecules to Populations	
MCDB 2150 & MCDB 2151	Principles of Genetics and Principles of Genetics Laboratory	
MCDB 2150 & MCDB 2161	Principles of Genetics and From DNA to Genes, Phage Genomics Laboratory II	
MCDB 2150 & MCDB 2171	Principles of Genetics and Drug Discovery Through Hands-On Screens 2	
Select one of the following statistics/computation requirement:		3-4
BCOR 1020	Business Statistics	
EBIO 1010	Introduction to Quantitative Thinking for Biologists	
ECON 3818	Introduction to Statistics with Computer Applications	
IPHY 2800	Introduction to Statistics	
MATH 2510	Introduction to Statistics	
PSYC 2111	Psychological Science I: Statistics	
Upper-division Neuroscience Requirements		
MCDB 3135	Molecular Cell Biology I	3
Select at least three of the following:		9-10
NRSC 4032	Neurobiology of Learning and Memory	
NRSC 4052	Behavioral Neuroscience	
NRSC 4072	Clinical Neuroscience: A Clinical and Pathological Perspective	
NRSC 4082	Neural Circuits of Learning and Decision Making	
NRSC 4092	Behavioral Neuroendocrinology	
NRSC 4132	Neuropharmacology	
Select 9 credit hours of upper-division elective course work by taking additional courses from upper-division requirements above or from the following neuroscience and general science electives with a maximum of 6 credit hours allowed from courses outside of psychology and neuroscience: ¹		9
CHEM 4611	Survey of Biochemistry	
ECEN 3030	Electrical/Electronic Circuits Non-Major	
ECEN 4120	Neural Network Design	
ECEN 4811	Neural Signals and Functional Brain Imaging	
ECEN 4821	Neural Systems and Physiological Control	
ECEN 4831	Brains, Minds, and Computers	
EBIO 3240	Animal Behavior	
IPHY 3410	Introduction to Human Anatomy	
IPHY 3430	Introduction to Human Physiology	
IPHY 3470	Human Physiology 1	
IPHY 4200	Physiological Genetics and Genomics	
IPHY 4580	Sleep Physiology	

IPHY 4720	Neurophysiology	
MCDB 3140	Cell Biology Laboratory	
MCDB 4201	From Bench to Bedside: The Role of Science in Medicine	
MCDB 4426	Cell Signaling and Developmental Regulation	
MCDB 4444	Cellular Basis of Disease	
MCDB 4680	Mechanisms of Aging	
NRSC 4011	Senior Thesis	
NRSC 4015	Affective Neuroscience	
NRSC 4062	The Neurobiology of Stress	
PSYC/NRSC 4155	Cognitive Neuroscience/Neuropsychology	
NRSC 4542	The Neurobiology of Mental Illness	
NRSC 4545	Neurobiology of Addiction	
PSYC 4021	Psychology and Neuroscience of Exercise	
PSYC 4142	Brain Injury, Plasticity and Recovery: From Neuron to Behavior	
NRSC 4561	Special Topics in Neuroscience	
MCDB 3651	The Brain: Dysfunction to Disease	
PSYC 4165	Psychology of Perception	
PSYC 4175	Computational Cognitive Neuroscience	

Ancillary Foundation Courses

Ancillary molecular biology requirement—select one of the following: 4-5

EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
MCDB 1150 & MCDB 1151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab	
MCDB 1150 & MCDB 1161	Introduction to Cellular and Molecular Biology and From Dirt to DNA: Phage Genomics Laboratory I	
MCDB 1150 & MCDB 1171	Introduction to Cellular and Molecular Biology and Drug Discovery Through Hands-on Screens I	

Ancillary calculus requirement: 5

MATH 1300	Calculus 1	
or MATH 1310		Calculus, Systems, and Modeling

Ancillary general chemistry sequence requirement—select one of the following options: 10

Option 1:		
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	
CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	

Option 2:
BCHM/CHEM Majors: the for-majors CHEM courses count. Discuss with you NRSC advisor.

Ancillary organic chemistry requirement: 4

CHEM 3311	Organic Chemistry 1 ²	
or CHEM 3351		

Total Credit Hours 57-62

¹ Please check all prerequisites and corequisites before enrolling in courses.

- ² Students planning graduate/medical school or work in the biotechnology industry should plan to take CHEM 3331 and CHEM 3341. Students should verify program requirements for any additional chemistry prerequisites.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major.

To maintain adequate progress in neuroscience, students should meet the following requirements:

- The neuroscience major must be started in the first semester. Adequate progress is defined as cumulative completion of at least one fourth of the required course work for the major during each academic year, including the following specific requirements: a) The ancillary molecular biology requirement and the genetics requirement must be completed during the first year; b) All ancillary requirements (molecular biology, calculus and general chemistry) and Introduction to Neuroscience and Laboratory Techniques in Neuroscience must be completed by the end of the second year.
- The neuroscience major requires at least 55 hours of required course work. Thus, at least 14 hours must be completed yearly, including timely completion of advanced course prerequisites.
- The four-year guarantee also requires completion of 30 hours of core curriculum courses by the end of the sophomore year. Calculus counts as three hours of QRMS; chemistry and molecular biology count as 13 hours of natural science.

Course	Title	Credit Hours
Year One		
Fall Semester		
MCDB 1150 with 1151, 1161, 1171, or 2171: Molecular Biology with lab (Preferred course to fulfill ancillary requirement. Taking a two credit lab will fulfill Genetics lab requirement).		4
CORE: Skills Acquisition (example: Lower Division Written Communication)		3
CORE: Content Area of Study (example: Ideals & Values)		3
Elective/MAPS: (example: if needed pre-requisite for MATH1300 or CHEM 1021 as preparation for General Chemistry. Speak to an advisor if you need both preparatory courses).		3
Elective/MAPS		3
	Credit Hours	16
Spring Semester		
MCDB 2150 & MCDB 2151	Principles of Genetics and Principles of Genetics Laboratory	4
MATH 1300	Calculus 1	5
CORE: Content Area of Study (example: U.S. Context)		3
CORE: Content Area of Study (example: Human Diversity)		3
	Credit Hours	15

Year Two

Fall Semester

CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5
NRSC 2100	Introduction to Neuroscience	4
CORE: Content Area of Study (example: Lower-Division Literature & the Arts)		3
CORE: Content Area of Study (example: Historical Context)		3
	Credit Hours	15

Spring Semester

CHEM 1133 & CHEM 1134	General Chemistry 2 and Laboratory in General Chemistry 2	5
NRSC 2200	Laboratory Techniques in Neuroscier	2
NRSC Statistics/Computation course: (See Degree Audit for choices. Check for pre-requisites.)		3
Elective/MAPS		3
Elective/MAPS		3
	Credit Hours	16

Year Three

Fall Semester

NRSC Core 4000 level course: (Three courses required, see Degree Audit for Choices)		3
NRSC Core 4000 level course: (Three courses required, see Degree Audit for Choices)		3
MCDB 3135	Molecular Cell Biology I	3
CORE: Skills Acquisitions (ex: Upper-Division Written Communication)		3
Elective/MAPS		3
	Credit Hours	15

Spring Semester

NRSC Core 4000 level course: (Three courses required, see Degree Audit for Choices)		3
CHEM 3311: Organic Chemistry 1 (Most common choice, see Degree Audit for additional choices. Talk to advisor about good choices if interested in Graduate/Medical School or working in the Biotechnology Industry)		4
Elective/MAPS		3
Elective/MAPS		3
	Credit Hours	13

Year Four

Fall Semester

NRSC Upper-division Elective course: (Three courses required, see Degree Audit for Choices)		3
NRSC Upper-division Elective course: (Three courses required, see Degree Audit for Choices)		3
Elective/MAPS		3
Elective/MAPS		3

Elective	3		
		Credit Hours	15
Spring Semester			
NRSC Upper-division Elective course: (Three courses required, see Degree Audit for Choices)	3		
CORE: Content Area of Study (example: Contemporary Societies)	3		
Elective/MAPS	3		
Elective/MAPS	3		
Elective	3		
		Credit Hours	15
		Total Credit Hours	120

EBIO 1210 General Biology 1
& EBIO 1230 and General Biology Laboratory 1

Either:

PSYC 2012 Biological Psychology
or NRSC 210 Introduction to Neuroscience

One course in general genetics

Select one of the following:

EBIO 2070 Genetics: Molecules to Populations
MCDB 2150 Principles of Genetics
IPHY 4200 Physiological Genetics and Genomics

Or an approved equivalent general genetics course

One course in statistics:

Select one of the following:

PSYC 2111 Psychological Science I: Statistics
IPHY 2800 Introduction to Statistics
EBIO 1010 Introduction to Quantitative Thinking for Biologists
EBIO 4410 Biometry
MATH 2510 Introduction to Statistics

Or an approved equivalent statistics course

At least two additional upper - division Neuroscience/Behavior courses in IPHY, MCDB, PSYC and/or another department; one of these courses has to be outside of the home department. In the case of double majors, one advanced neuroscience course from each major department fulfills this requirement.

All courses must be taken for a letter grade (no pass/fail).

For more information on this certificate, see the Neuroscience Undergraduate Certificate (<http://www.colorado.edu/neuroscienceprogram/ugcert.html>) website or send e-mail to Prof. Serge Campeau (Serge.Campeau@Colorado.EDU), director of the program. Answers to Frequently Asked Questions are also available on this web page.

To obtain the certificate, a student must satisfy the requirements of a major and the neuroscience certificate program, and maintain a grade point average of 3.20 or better.

Psychology - Bachelor of Arts (BA)

The psychology major provides a fundamental understanding of the principles of human cognition, emotion, behavior, social interactions and mind-brain relationships. Our distinguished faculty also teach excellent upper division courses in areas of expertise that include, but are not limited to, behavioral genetics, cognitive neuroscience, cognitive psychology, clinical psychology, child development, women's health, and judgment and decision making.

International Bachelor of Arts (IBA)

The International Bachelor of Arts (IBA) is a joint degree between the University of Colorado Boulder and the University of Wollongong, Wollongong, Australia. To earn an IBA in Psychology, in addition to completing all the current requirements for the BA with a major in Psychology at the home institution, students must complete one full-time semester experiential, customized, international learning experience at the non-home institution.

Neurosciences and Behavior - Certificate

The neurosciences certificate program encourages undergraduate students interested in how the brain controls behavior to take courses in the basic sciences while providing the means to specialize in neuroscience.

Since this subdiscipline of the biological sciences spans a number of departments at the university (e.g., integrative physiology, psychology & neuroscience, and MCD biology), students are encouraged to obtain greater academic breadth through interdepartmental course selection.

For more information, see www.colorado.edu/neuroscienceprogram (<http://www.colorado.edu/neuroscienceprogram>).

Requirements

The Neuroscience Certificate Requirements are:

Required Courses

General Chemistry sequence with lab (or equivalent sequence)

CHEM 1113 General Chemistry 1
& CHEM 1114 and Laboratory in General Chemistry 1

CHEM 1133 General Chemistry 2
& CHEM 1134 and Laboratory in General Chemistry 2

Organic Chemistry sequence (or equivalent sequence)

CHEM 3311 Organic Chemistry 1
& CHEM 3321 and Laboratory in Organic Chemistry 1

CHEM 3331 Organic Chemistry 2
& CHEM 3341 and Laboratory in Organic Chemistry 2

General Physics sequence with lab (or equivalent sequence)

PHYS 2010 General Physics 1
& PHYS 2020 and General Physics 2

Biology with lab

Select one of the two options (or approved equivalent biology courses):

MCDB 1150 Introduction to Cellular and Molecular Biology
& MCDB 1151 and Introduction to Cell and Molecular Biology Lab

OR

Concurrent Degree Program

BA/MA in Psychology with Specialization in Cognitive Psychology

A concurrent BA/MA in psychology with a specialization in cognitive psychology is offered. Both the BA and MA degree must be completed within a five-year period. In recent years, both basic and applied research in cognitive psychology have come to rely increasingly on related findings, theories and methods in other cognitive science disciplines, including philosophy, computer science and linguistics.

The purpose of this degree program is to provide training that prepares students either for continuing doctoral study in cognitive psychology or for technical careers involving cognitive psychology in government and industry. Students complete the requirements for an undergraduate major in psychology, an interdisciplinary undergraduate certificate in cognitive science and a master's degree in the cognitive psychology graduate training program. Because of the demanding nature of this program, only highly qualified students are admitted.

Requirements

Prerequisites

It is policy to enforce the course prerequisites listed in the course descriptions. If you have not either taken and passed (C- or better) the prerequisites for a course, or obtained permission from the instructor or a departmental advisor to take the course based on equivalent preparatory course work or experience here or elsewhere, you may be administratively dropped from the course.

Degree Requirements

Students must complete the general requirements of the College of Arts and Sciences and the requirements listed below. Students must fulfill all of the following requirements with a grade of C- or better. Additional explanatory notes are available in the department advising office, Muenzinger D260.

Transfer students must complete a minimum of 12 upper-division credit hours of psychology course work on the Boulder campus with a C- or better. Of those 12 credit hours, one laboratory and methods course must be included.

The department recommends taking PSYC 1001, PSYC 2012, PSYC 2145, PSYC 2606 and PSYC 2111 by the end of the sophomore year, and PSYC 3111 by the end of the junior year.

Required Courses and Credit Hours

Required Courses

PSYC 1001	General Psychology	3
PSYC 2012	Biological Psychology	3
PSYC 2145	Introductory Cognitive Psychology	3
PSYC 2606	Social Psychology	3
PSYC 2111	Psychological Science I: Statistics	4
PSYC 3111	Psychological Science 2: Research Methods in Psychology	4
PSYC 3102 or PSYC 3303	Behavioral Genetics Abnormal Psychology	3

Laboratory or Methods course

Select at least one upper-division laboratory and methods courses from the following: 4

PSYC 3001	Honors Research Methods Seminar
PSYC/NRSC 4052	Behavioral Neuroscience
PSYC 4136	Judgment and Decision Making
PSYC 4145	Advanced Cognitive Psychology
PSYC/NRSC 4155	Cognitive Neuroscience/Neuropsychology
PSYC 4165	Psychology of Perception
PSYC 4175	Computational Cognitive Neuroscience
PSYC 4376	Research Methods in Social Psychology
PSYC 4443	Research Methods in Clinical Psychology
PSYC 4733	Psychological Testing and Assessment
PSYC 4744	Methods in Developmental Psychology

Upper-Division PSYC or NRSC electives 7

Ancillary Natural Science sequence (some courses may have required labs):

Select one of the following natural science sequences:² 6-10

CHEM 1011 & CHEM 1031	Environmental Chemistry 1 and Environmental Chemistry 2
CHEM 1113 & CHEM 1133	General Chemistry 1 and General Chemistry 2
CHEM 1400 & CHEM 2100	Foundations of Chemistry and Chemical Energetics and Dynamics
EBIO 1210 & EBIO 1220	General Biology 1 and General Biology 2
MATH 1300 & MATH 2300	Calculus 1 and Calculus 2
MCDB 1150 & MCDB 2150	Introduction to Cellular and Molecular Biology and Principles of Genetics
MCDB 1150 & EBIO 1220	Introduction to Cellular and Molecular Biology and General Biology 2
PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2 (calculus based)
PHYS 2010 & PHYS 2020	General Physics 1 and General Physics 2 (algebra based)

Total Credit Hours 40-44

¹ Students are encouraged to use independent study to gain field or laboratory experience. However, independent study credit hours are pass/fail credit hours only and cannot be used toward the 34 credit hours required for graduation.

² The student is required to pass with a grade of C- or better.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility.

Course	Title	Credit Hours
Year One		
Fall Semester		
PSYC 1001	General Psychology	3-4
MATH Prerequisite for PSYC 2111: (example: MATH 1011, 1150, or 1300, also fulfills Core: Quantitative Reasoning & Mathematical Skills)		3
EBIO 1210	General Biology 1 ¹	3
CORE: Skills Acquisition (example: Lower Division Written Communication)		3

Elective/MAPS		3
	Credit Hours	15-16
Spring Semester		
PSYC 2606	Social Psychology	3
PSYC 2145	Introductory Cognitive Psychology	3
EBIO 1220	General Biology 2 ¹	3
EBIO 1240	General Biology Laboratory 2	1
Elective/MAPS		3
Elective/MAPS		3
	Credit Hours	16
Year Two		
Fall Semester		
PSYC 2111	Psychologic Science I: Statistics	4
PSYC 2012	Biological Psychology	3
CORE: Content Area of Study (example: Human Diversity)		3
Elective/MAPS		3
Elective/MAPS		3
	Credit Hours	16
Spring Semester		
PSYC 3111	Psychologic Science 2: Research Methods in Psychology	4
CORE: Content Area of Study (example: Lower-Division Literature & the Arts)		3
CORE: Content Area Natural Science		3
Elective/MAPS		3
	Credit Hours	13
Year Three		
Fall Semester		
PSYC 3303 or PSYC 3102	Abnormal Psychology or Behavioral Genetics	3
PSYC Elective: Upper Division		3
CORE: Content Area of Study (example: US Context)		3
CORE: Skills Acquisitions (ex: Upper Division Written Communication)		3
Elective: Upper Division		3
	Credit Hours	15
Spring Semester		
PSYC Approved Laboratory and Methods course: (At least one upper-division course required, see Degree Audit for choices)		4
PSYC Elective: Upper Division		3
CORE: Content Area of Study (example: Upper-Division Literature & the Arts)		3
CORE: Content Area of Study (example: Ideals & Values)		3
Elective/MAPS		3
	Credit Hours	16

Year Four**Fall Semester**

PSYC Elective: Upper-Division		3
CORE: Content Area of Study (example: Historical Context)		3
Elective/MAPS		3
Elective/MAPS		3
Elective/MAPS		3
	Credit Hours	15

Spring Semester

Elective/MAPS		3
	Credit Hours	15
	Total Credit Hours	121-122

¹ PSYC approved Natural Science Sequence and Ancillary. Also fulfills Core: Content Area Natural Science. Other choices can be found in your Degree Audit, but EBIO 1210 and 1220 are the most common.)

Religious Studies

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion, through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in one religious tradition, such as Buddhism, Christianity, Daoism, Hinduism, Islam and Native American traditions.

The undergraduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

Course codes for this program are RLST and SNSK.

Bachelor's Degree

- Religious Studies - Bachelor of Arts (BA) (p. 486)

Minor

- Religious Studies - Minor (p. 487)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ali, Aun H (https://experts.colorado.edu/display/fisid_155948)
Assistant Professor; PhD, McGill Univ (Canada)

Biernacki, Loriliai (https://experts.colorado.edu/display/fisid_115294)
Associate Professor; PhD, University of Pennsylvania

Boyd, Samuel L (https://experts.colorado.edu/display/fisid_155484)
Assistant Professor

Catlos, Brian Aivars (https://experts.colorado.edu/display/fisid_147829)
Professor; PhD, Univ of Toronto (Canada)

Chernus, Ira R (https://experts.colorado.edu/display/fisid_101043)
Professor; PhD, Temple University

Denny, Frederick M.
Professor Emeritus

Gayley, Antonia Hollis (https://experts.colorado.edu/display/fisid_144505)
Assistant Professor; PhD, Harvard University

Gill, Sam D (https://experts.colorado.edu/display/fisid_103595)
Professor; PhD, University of Chicago

Johnson, Gregory B (https://experts.colorado.edu/display/fisid_111214)
Associate Professor; PhD, University of Chicago

Kleeman, Terry F (https://experts.colorado.edu/display/fisid_114181)
Professor; PhD, University of California-Berkeley

Ross-Bryant, Lynn
Professor Emeritus

Sacks, Elias R. (https://experts.colorado.edu/display/fisid_151425)
Assistant Professor; PhD, Princeton University

Shneer, David (https://experts.colorado.edu/display/fisid_146105)
Professor; PhD, University of California-Berkeley

Taylor, Rodney L.
Professor Emeritus

Whitehead, Deborah Faith (https://experts.colorado.edu/display/fisid_144239)
Associate Professor; ThD, Harvard University

RLST 1620 (3) Religious Dimension in Human Experience

Studies religion as individual experience and social phenomenon. Examines varieties of religious language (symbol, myth, ritual, scripture) and of religious experience (Asian, Western, archaic).

Additional Information: Arts Sci Core Curr: Ideals and Values

RLST 1800 (3) Cyborgs and Robots: Implications for Gender and Religion

Making is the core idea that connects artificial intelligence (cyborgs and robots) with classic literature (Prometheus, Pygmalion, Golem and Frankenstein) and fundamental religious and cultural concerns (Genesis, technology, work). The guiding question is what will humanity and religion be in the future? The goal is less predictive than to set a mandate with potential strategies for those who will create this future.

Grading Basis: Letter Grade

RLST 1818 (3) Introduction to Jewish History: Bible to 1492

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1818 and JWST 1818

RLST 1820 (3) Religion and Politics in Ancient Egypt

Studies the literature, politics, religions and other traditions of Ancient Egypt.

Repeatable: Repeatable for up to 3.00 total credit hours.

RLST 1828 (3) Introduction to Jewish History since 1492

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1828 and JWST 1828

RLST 1830 (3) Global History of Holocaust and Genocide

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1830 and JWST 1830

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

RLST 1850 (3) Ritual and Media

Ritual continues to play an important role in contemporary societies in both religious and secular contexts. This course examines the elements and genres of ritual activity from African rites of passage to the Beijing Olympics, paying close attention to how the media documents, appropriates and transforms aspects of ritual.

Additional Information: Arts Sci Core Curr: Contemporary Societies

RLST 1900 (3) Introduction to the Hebrew Bible/Old Testament

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

Equivalent - Duplicate Degree Credit Not Granted: JWST 1900

Grading Basis: Letter Grade

RLST 1910 (3) Introduction to the New Testament

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1910

Grading Basis: Letter Grade

RLST 2200 (3) Religion and Dance

Connecting dancing to religions across the globe demonstrates the near synonymy of the two in most cultures, the remarkable potential for dancing to articulate cultural identity, and finally that dancing is strongly connected to what distinguishes being human. Provides an enriched appreciation of dancing and the introduction to dancing in many cultures.

Grading Basis: Letter Grade

RLST 2202 (3) Islam

Introduces students to foundational Islamic concepts, texts, core practices, historical narratives and intellectual, spiritual and literary traditions. Topics covered include: the figure of Muhammad; the Quran; the emergence of distinct Muslim identities; Hadith; Sharia; Islamic theology; Islamic philosophy; science in Islamic civilization; Islamic mysticism; the impact of colonialism and modernity on the Muslim world; gender and sexuality; political Islam.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

RLST 2320 (3) The Muslim World, 600-1250

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamicate society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills.

Equivalent - Duplicate Degree Credit Not Granted: ARAB 2320

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Asia Content

RLST 2400 (3) Religion and Contemporary Society

Explores the role of religion in contemporary society, focusing on debates in religious ethics. Examining diverse voices from Christianity, Judaism and other traditions, this course considers religion's role in debates about issues such as same-sex marriage, climate change, war, criminal justice, torture, sexual ethics, abortion and economic justice.

Additional Information: GT Pathways: GT-SS3 - Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

RLST 2500 (3) Religions in the United States

Explores the development of various religions within the shaping influences of American culture, including separation of church and state, the frontier experience, civil religion, and the interaction of religions of indigenous peoples, immigrants, and African Americans.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

RLST 2600 (3) Judaism, Christianity, and Islam

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2600

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

RLST 2610 (3) Religions of India

Introduces Hinduism, Buddhism, Jainism and Sikhism, in historical perspective.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

RLST 2612 (3) Yoga: Ancient and Modern

Addresses the history and philosophy of yoga, beginning from its earliest articulations in Vedic India 1200 BCE up to contemporary understandings of yoga. Examines yoga's historical evolution from a primarily mental practice to a bodily centered practice. Looks at the shifts yoga undergoes as it becomes popular in the modern West.

Additional Information: Arts Sci Core Curr: Human Diversity

RLST 2614 (3) Paganism to Christianity

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2610

Additional Information: Arts Sci Core Curr: Ideals and Values

RLST 2620 (3) Religions of East Asia

Introduces literature, beliefs, practices, and institutions of Taoism, Confucianism, Buddhism, and Shintoism in historical perspective.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

RLST 2700 (3) American Indian Religious Traditions

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2703

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Ideals and Values

RLST 2800 (3) Women and Religion

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism, and goddess traditions.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2800

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

RLST 2840 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

RLST 3000 (3) Christian Traditions

Serves as an introduction to the academic study of Christianity, understood in its historical context, beginning with its most remote Mesopotamian origins and through to beginnings of the Protestant Reformation. Coverage is global, but "Western" Christian tradition are emphasized, as is the evolution of doctrine, ritual and institutions in relation to social, cultural and political factors.

Additional Information: Arts Sci Core Curr: Historical Context

RLST 3010 (3) Religion and the Senses

Expanding the five common senses so they are grounded on a more fundamental kinesthetic sense, that is, sense of movement, this course focuses on the study of religion and culture on all those marvelous richly and sensuously textured aspects of religious behavior: movement, experience, feeling, action, sensation, gesture, art, music, dancing, architecture, costume, food, and ritual.

RLST 3020 (3) Advanced Writing in Religious Studies

Seminar for religious studies majors that emphasizes the development of writing skills for use inside as well as outside the academy. Writing assignments are focused on one or more core topics in religious studies.
Requisites: Restricted to students with 57-180 credits (Junior or Senior) Religious Studies (RLST) majors only.

Additional Information: Arts Sci Core Curr: Written Communication

RLST 3040 (3) The Quran

Explores the Quran from multiple perspectives including literary criticism, ethnomusicology, translation, history, paleaography, classical exegesis, Feminist Studies, Judicial interpretation, Islamic philosophy, materiality, Islamic law, spirituality, hip-hop and Jihadism.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

RLST 3050 (3) Religion and Literature in America

Studies religious dimensions of American culture through representative literature, beginning with the Puritans and focusing on diversity in the 19th and 20th centuries.

Additional Information: Arts Sci Core Curr: United States Context

RLST 3060 (3) Fundamentalism and Islam

Explores the global rise of fundamentalism, particularly Islamic fundamentalism. Students will analyze fundamentalism as a function of modernity, and in metaphysical rather than geostrategic or cultural terms. Students will examine the arguments of Muslim fundamentalists, and the counterarguments of their critics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

RLST 3070 (3) Sufism

Examines the development of Sufism from a piety movement to a social institution. Students will be introduced to classical and modern expressions of Sufism including treatises on spirituality and ethics, commentaries on the Quran, timeless poetry, music and mystical philosophy. Students will learn how Sufism differs across cultural contexts and how it compares to other mystical traditions.

RLST 3100 (3) Judaism

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3100

Additional Information: Arts Sci Core Curr: Historical Context
 Departmental Category: Asia Content

RLST 3110 (3) Of Jewish Legends, Folktales and the Supernatural

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3110

RLST 3120 (3) Radical Jews

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3120

Grading Basis: Letter Grade

RLST 3200 (3) Hinduism

Studies literature, beliefs, practices, and institutions of Hinduism, in historical perspective.

Additional Information: Departmental Category: Asia Content

RLST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3201 and JWST 3202 and HEBR 3202

Additional Information: Arts Sci Core Curr: Human Diversity

RLST 3300 (3) Foundations of Buddhism

Introduction to Buddhist thought and practice in the variety of its historical and cultural contexts. The course begins with an exploration of narrative, cosmology, doctrine and ritual in early Buddhism and the Theravada of South and Southeast Asia. Through case studies, we then trace diverse conceptions of the Buddhist path in Tibet and East Asia where the Mahayana spread.

Additional Information: Departmental Category: Asia Content

RLST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3530 and JWST 3530

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

RLST 3550 (3) Tibetan Buddhism

Explores Tibetan Buddhism through literature and film, including sacred biographies, treatises on the Buddhist path and films providing a visual window into Tibetan life worlds. We examine different kinds of Tibetan journeys: moving through the life cycle, treading the path of self-cultivation, embarking on solitary retreat, traversing from death to rebirth and traveling on pilgrimage and into exile.

Grading Basis: Letter Grade

RLST 3750 (3) Women in Buddhism

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra, and contemporary issues such as the nun's revival moment.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3750

Additional Information: Departmental Category: Asia Content

RLST 3800 (3) Chinese Religions

Studies classical Confucianism, Taoism, Buddhism, and Neo-Confucianism within the historical context of Chinese culture.

Additional Information: Departmental Category: Asia Content

RLST 3820 (3) Topics in Religious Studies

Intensive study of a selected area or problem in religious studies.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

RLST 3838 (3) Dancing, Religion, and Culture

A critical examination of the received cultural, religious, and academic understandings of dancing and the body; the construction of a richer theory of dancing that will more adequately support comparative studies; the study of dancing in cultures and religions in a diverse representation of cultures; and a more in depth social study of Latin American dancing including actual dancing experience.

RLST 3850 (3) The Mediterranean Religion Before Modernity

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3850

Additional Information: Arts Sci Core Curr: Historical Context

RLST 4030 (3) Religions in America

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5030

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

RLST 4045 (3) Ritual Art Dance Drama

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5045

Grading Basis: Letter Grade

RLST 4050 (3) Topics in Christian Studies

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5050

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

RLST 4170 (3) God and Politics

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5170 and JWST 4170

RLST 4180 (3) Is God Dead?

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5180 and JWST 4180

RLST 4200 (3) Topics in Hinduism

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5200

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 4250 (3) Topics in Buddhism

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America. Department enforced prerequisite: RLST 2610 or RLST 2620 or RLST 3300 or instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5250

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Asia Content

RLST 4260 (3) Topics in Judaism

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5260 and JWST 4260

Repeatable: Repeatable for up to 9.00 total credit hours.

RLST 4280 (3) Body and Magic in India

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5280

RLST 4300 (3) Topics in Native American Religions

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5300

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of RLST 2700 (minimum grade C-).

Recommended: Prerequisite 3 additional credit hours of RLST course work or instructor consent.

RLST 4353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5353 and ETHN 4353 and ETHN 5353

RLST 4450 (3) Religion and Nonviolence

Studies theories of nonviolence developed by major thinkers and movements, especially in the U.S., in the context of their religious commitments and beliefs and their historical circumstances.

RLST 4650 (3) Islam in the Modern World

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5650

Recommended: Prerequisite 6 credit hours of religious studies at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 4750 (3) Daoism

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5750 and CHIN 4750 and CHIN 5750

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

RLST 4800 (3) Critical Studies in Religion

Focuses on a current issue or area of research in the study of religion. Students analyze the way theories develop and learn to develop their own critical analysis. Topics vary, e.g., comparative kingship, colonialism, ritual theories, feminist analysis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Religious Studies (RLST) majors only.

RLST 4810 (3) Honors Thesis

Students write an honors thesis based on independent research under the direction of a faculty member. Required for students who elect departmental honors.

Additional Information: Arts Sciences Honors Course

RLST 4820 (3) Interdisciplinary Seminar on Religion: Topics

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5820

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Requisite 6 credit hours of religious studies at any level or instructor consent.

RLST 4830 (3) Senior Majors Seminar

Topics and instructors vary. Brings advanced majors together in order to focus their major experience on significant topics and issues of common interest.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

RLST 4840 (1-6) Senior Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

RLST 4850 (3) Gender in Hagiography

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5850 and WGST 4850

Grading Basis: Letter Grade

SNSK 1010 (3-4) Introductory Sanskrit 1

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Sanskrit

SNSK 1020 (3-4) Introductory Sanskrit 2

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 1020 (minimum grade C-).

Additional Information: Departmental Category: Sanskrit

SNSK 2110 (3-4) Intermediate Sanskrit 1

Continued study of the grammar of classical Sanskrit and translation of selected readings from the literature.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 1020 (minimum grade C-).

Additional Information: Departmental Category: Sanskrit

SNSK 2120 (3-4) Intermediate Sanskrit 2

Continuation of SNSK 2110.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 2110 (minimum grade C-).

Additional Information: Departmental Category: Sanskrit

Religious Studies - Bachelor of Arts (BA)

The curriculum in the Department of Religious Studies at the University of Colorado Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion, through careful study of history, texts, rituals, narrative, art, and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in one religious tradition,

such as Buddhism, Christianity, Daoism, Hinduism, Islam and Native American traditions.

The undergraduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

Graduation with Honors

The Honors Program in Religious Studies offers the opportunity for highly motivated undergraduates to undertake a deeper and more individualized study than is provided by the regular BA curriculum and to earn an honors designation on their diploma. Religious studies majors with at least a 3.30 overall grade point average and 3.50 in the major are eligible to participate in the program. Honors that may be earned are cum laude (with honors), magna cum laude (with high honors), and summa cum laude (with highest honors).

Students interested in pursuing departmental honors are encouraged to consult with the departmental undergraduate advisor by the beginning of their junior year.

Concurrent Degree Program BA/MA in Religious Studies

A concurrent bachelor's/master's degree program offers a select group of exceptional undergraduates the opportunity to begin graduate work while still an undergraduate and thereby complete the BA and MA degrees simultaneously and on an accelerated schedule. The entire program normally requires five to six years and permits 6 credit hours to be double-counted toward both degrees; otherwise, requirements for the two degrees remain unchanged.

Admission to the Program

Applicants to the program must be full-time, continuously enrolled students with a minimum overall GPA of 3.00, and a 3.50 GPA in RLST courses. They must have completed at least 24 credit hours prior to admission to the concurrent BA/MA degree program, and must have satisfied any MAPS deficiencies. Applications will include letters of recommendation from RLST faculty and will be evaluated by faculty as a whole, much as graduate applications are.

Continuation in the Program

Students enrolled in the concurrent BA/MA program must maintain a minimum cumulative GPA of 3.25, and 3.50 in the department. Concurrent degree students may not participate in the Time Out program; exceptions may be granted by the CDAC (Concurrent Degree Appeals Committee) based on a review of extenuating circumstances. Each BA/MA student will be assigned a graduate advisor with whom to meet regularly and will be required to demonstrate satisfactory progress toward degree to the advisor within the framework of the department's graduate student assessment policies.

Curriculum

Students enrolled in the concurrent BA/MA program are permitted to double-count 6 credit hours of course work, thereby reducing the total amount of RLST course work to $(36 + 31 - 6 =) 61$ credit hours. One of these courses must be RLST 6830, which would replace Senior Seminar for BA/MA students, and the other must be in an area of depth concentration. Otherwise program students will fulfill all the normal requirements for the BA and the MA degree.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and at least 36 credit hours of religious studies course work, at least 12 of which must be upper-division. At least 27 credit hours must be taken in the CU Department of Religious Studies in addition to the following requirements.

Required Courses and Semester Credit Hours

Academic Study of Religion Requirement

RLST 1620	Religious Dimension in Human Experience	3
RLST 4830	Senior Majors Seminar	3

Cluster Requirement

Select three courses in either of the following: 9

A single religious tradition (i.e. Buddhism, Christianity, East Asian Religions, Hinduism, Islam, Judaism, Native American and Indigenous Religions)

A particular theme (i.e. ancient and medieval religions, gender and sexuality, interreligious interactions, law and politics, media, culture, and contemporary society, philosophy and ethics, religion and violence, ritual, performance, and the body)

Electives	21
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Total Credit Hours	36
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Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in religious studies, students should meet the following requirements:

- At the beginning of the second semester of study, declare the major.
- Each semester, complete two religious studies courses.
- The last spring semester in residence, take the senior seminar.

Religious Studies - Minor

The Department of Religious Studies offers a minor in religious studies in addition to the BA. Students are subject to the College of Arts and Sciences minor requirements.

Requirements

Students must complete at least 18 credit hours in religious studies course work, including at least 6 credit hours of lower-division and 9 credit hours of upper-division work. At least 12 credit hours must be taken in the CU Department of Religious Studies.

Sociology

Sociology is the study of society. Students who major in sociology have the opportunity to learn in-depth about social structures and processes,

and to gain skills in critical thinking, writing, and data analysis. Sociology graduates go into many different fields, as described by a recent study by the American Sociological Association.

Course code for this program is SOCY.

Bachelor's Degree

- Sociology - Bachelor of Arts (BA) (p. 494)

Minor

- Sociology - Minor (p. 495)

Certificate

- Care, Health and Resilience - Certificate (p. 495)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Patricia A.
Professor Emeritus; PhD, University of California, San Diego

Bailey Mollborn, Stefanie Faun (https://experts.colorado.edu/display/fisid_142921)
Associate Professor; PhD, Stanford University

Bartos, Otomar J.
Professor Emeritus

Belknap, Joanne Elizabeth (https://experts.colorado.edu/display/fisid_113617)
Professor; PhD, Michigan State University

Boardman, Jason D (https://experts.colorado.edu/display/fisid_125577)
Professor; PhD, University of Texas at Austin

Brown, Matthew C (https://experts.colorado.edu/display/fisid_107370)
Instructor; PhD, University of Colorado Boulder

Downey, Liam C (https://experts.colorado.edu/display/fisid_129297)
Associate Professor; PhD, University of Arizona

Downton, James V.
Professor Emeritus

Elliott, Delbert S.
Professor Emeritus

Gimenez, Martha E.
Professor Emeritus

Grant II, Don Sherman (https://experts.colorado.edu/display/fisid_154039)
Professor; PhD, Ohio State University

Harrison, Jill Lindsey (https://experts.colorado.edu/display/fisid_149614)
Associate Professor; PhD, University of California-Santa Cruz

Hubbard, Eleanor
Professor Emeritus

Hunter, Lori Mae (https://experts.colorado.edu/display/fisid_118372)
Professor; PhD, Brown University

Irvine, Leslie Jane (https://experts.colorado.edu/display/fisid_113150)
Professor; PhD, SUNY at Stony Brook

Kjolseth, J. Rolf
Professor Emeritus

Masters, Ryan Kelly (https://experts.colorado.edu/display/fisid_152730)
Assistant Professor; PhD, University of Texas at Austin

Mayer, Thomas
Professor Emeritus

Menken, Jane A (https://experts.colorado.edu/display/fisid_112411)
Distinguished Professor; PhD, Princeton University

Mileti, Dennis S.
Professor Emeritus

Mojola, Sanyu Amimo (https://experts.colorado.edu/display/fisid_145741)
Associate Professor; PhD, University of Chicago

Pampel, Fred
Professor Emeritus

Pedersen-Gallegos, Liane G (https://experts.colorado.edu/display/fisid_107962)
Instructor

Pinto, Leonard J.
Professor Emeritus

Platter, Adele
Professor Emeritus

Pyrooz, David C (https://experts.colorado.edu/display/fisid_155784)
Assistant Professor; PhD, Arizona State University

Radelet, Michael L (https://experts.colorado.edu/display/fisid_121802)
Professor; PhD, Purdue University

Regoli, Robert M.
Professor Emeritus

Rinaldo, Rachel Ann (https://experts.colorado.edu/display/fisid_156309)
Assistant Professor; PhD, University of Chicago

Riosmena, Fernando (https://experts.colorado.edu/display/fisid_144419)
Associate Professor; PhD, University of Pennsylvania

Rogers, Richard G (https://experts.colorado.edu/display/fisid_106129)
Professor; PhD, University of Texas at Austin

Steen, Sara (https://experts.colorado.edu/display/fisid_122698)
Associate Professor; PhD, University of Washington

Sue, Christina Alicia (https://experts.colorado.edu/display/fisid_145679)
Associate Professor; PhD, University of California-Los Angeles

Tierney, Kathleen Jane (https://experts.colorado.edu/display/fisid_125978)
Professor; PhD, Ohio State University

Wadsworth, Thomas Pearson (https://experts.colorado.edu/display/fisid_144382)
Associate Professor; PhD, University of Washington

Walden, Glenda D (https://experts.colorado.edu/display/fisid_105898)
Instructor; PhD, University of Colorado Boulder

Wanderer, Jules J.
Professor Emeritus

Wehr, Paul E.
Professor Emeritus

Wilkins, Amy Catherine (https://experts.colorado.edu/display/fisid_143151)
Associate Professor; PhD, University of Massachusetts at Amherst

SOCY 1001 (3) Introduction to Sociology

Examines basic sociological ideas including social relations, social interaction, social structure, and social change. Examples are drawn from societies around the world.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: General Sociology

MAPS Course: Social Science

SOCY 1004 (3) Deviance in U.S. Society

Examines the social construction of deviance in the U.S., the process of acquiring a deviant identity and managing deviant stigma, and the social organization of deviant act, lifestyles, relationships and careers.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Departmental Category: Deviance and Criminology

SOCY 1006 (3) The Social Construction of Sexuality

Discusses the social determinants of sexuality. Analyzes the economic, psychological, and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

Equivalent - Duplicate Degree Credit Not Granted: WGST 1006

Additional Information: Departmental Category: Sex and Gender

SOCY 1016 (3) Sex, Gender, and Society 1

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

Equivalent - Duplicate Degree Credit Not Granted: WGST 1016

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Departmental Category: Sex and Gender

SOCY 1021 (3) United States Race and Ethnic Relations

An examination of race and minority problems in U.S. society, including the psychological, social, and cultural sources of prejudice and discrimination.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: United States Context

Departmental Category: General Sociology

SOCY 1022 (3) Ethics and Social Issues in U.S. Health and Medicine

Explores current ethical and policy issues in U.S. health and medical practices. Includes such issues as alcohol and drug abuse, organ transplants and substitutes, genetic engineering, contraception, abortion, occupational safety and health, and euthanasia.

Additional Information: Arts Sci Core Curr: Ideals and Values

Departmental Category: Population and Health Issue

SOCY 1841 (1-6) Independent Study in Sociology

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: General Sociology

SOCY 2011 (3) Contemporary Social Issues and Human Values

Explores contemporary societies on a global scale. Focuses on such issues as capitalism, socialism, race and ethnic problems, sex discrimination, poverty and the concentration of wealth, crime and deviance, human rights and human values, peace and war.

Additional Information: Departmental Category: General Sociology

SOCY 2021 (3) Nonviolence and the Ethics of Social Action

Examines nonviolence as a strategy of social action. Focuses on ethics and dynamics of nonviolent action; racial and economic justice movements; civil disobedience; and conscientious objection to war.

Additional Information: Departmental Category: General Sociology

SOCY 2031 (3) Social Problems

Examines U.S. society from a normative perspective emphasizing theories of social change. Considers such problems as distribution of power, unemployment, poverty, racism and sexism, the changing role of the family, and drugs.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Departmental Category: General Sociology

SOCY 2034 (3) Drugs in United States Society

Examines the relationship between drugs and social contexts. Lends insight into why people find consciousness alteration meaningful, what kinds of experiences and problems arise, and what types of social policies emerge to control drug use.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 2044 (3) Crime and Society

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, and how the institutions designed to address crime (police, courts, corrections) function.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2044

Additional Information: Departmental Category: Deviance and Criminology

SOCY 2061 (3) Introduction to Social Statistics

Introduces students to quantitative analysis of social phenomena. Emphasizes understanding and proper interpretation of graphs; measures of central tendency, dispersion, and association; and the concept of statistical significance. Assumes students have only limited mathematical background.

Additional Information: Departmental Category: General Sociology

SOCY 2077 (3) Environment and Society

Examines how both natural and built environments influence human behavior and social organization. Focuses on microenvironments and their influence on individuals; the impact of macroenvironments on societal organization; and environmental movements.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Environment and Society

SOCY 2080 (3) Sociology of the Helping Professions

Investigates how today's helping professionals are trained and socialized to care for clients, the challenges they face in working within modern bureaucracies and with advanced technologies and the importance of inter-professional care.

Additional Information: Departmental Category: General Sociology

SOCY 2091 (3) Topics in Sociology

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content. Students may receive credit for this course up to three times for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: General Sociology

SOCY 2092 (3) Sex, Power and Reproduction

Examines fertility, contraception and abortion with an emphasis on demographic trends, social stratification and policy impacts. Sociological, demographic and public health perspectives will be presented.

SOCY 3001 (3) Classical Theory

In-depth study of classical sociological theorists, particularly Marx, Durkheim, and Weber. Examines their roles in defining the discipline of sociology.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3002 (3) Population and Society

Examines population, its structure and processes, and its relationships to selected areas of the social structure. Examines Malthusian, neo-Malthusian, and Marxist perspectives.

Requisites: Restricted to Sociology (SOCY) majors only.

Additional Information: Departmental Category: Population and Health Issue

SOCY 3011 (3) Contemporary Theory

Continuation of SOCY 3001. In-depth study of modern and post-modern theories of the 20th century, including structural-functionalist, conflict, symbolic interactionist, feminist, and world system theories.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3012 (3) Women and Development

Investigates the status of women in the context of globalization and social and economic development.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3012

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Population and Health Issue

Departmental Category: Asia Content

SOCY 3016 (3) Marriage and the Family in U.S. Society

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3016

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: Sex and Gender

SOCY 3032 (3) Social Epidemiology

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision and health care delivery systems.

Additional Information: Departmental Category: General Sociology

SOCY 3041 (3) Self and Consciousness

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

Equivalent - Duplicate Degree Credit Not Granted: INVS 3041

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3042 (3) Topics in Population and Health

A variety of courses in population and/or health will be taught, usually by visiting lecturers. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Additional Information: Departmental Category: Population and Health Issue

SOCY 3044 (3) Race, Class, Gender, and Crime

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3044 and WGST 3044

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 3045 (3) Sociology of Death and Dying

Addresses sociological aspects of thanatology (the study of death and dying). Includes study of the social meaning of death and its normative treatment in western civilization, with a focus on the contemporary United States.

Requisites: Requires a prerequisite course of SOCY 1001 or SOCY 3001 (minimum grade D-).

Additional Information: Departmental Category: Population and Health Issue

SOCY 3046 (3) Topics in Sex and Gender

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3046

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sex and Gender

SOCY 3052 (3) Medical Sociology

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position, and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision, and health care delivery systems.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Population and Health Issue

SOCY 3141 (3) Social Movements in the U.S

Considers theory and research about American social movements. Emphasizes leadership, ideology, recruitment, strategy, organizational dynamics, public response, and reasons for success or failure.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: General Sociology

SOCY 3151 (3) Self in Modern Society

Explores how modern social institutions and culture shape our personal experiences, how personal experiences can affect the nature of those, institutions and culture, and how strategies can be developed for achieving balance between the individual and society.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Ideals and Values
Arts Sci Core Curr: United States Context
Departmental Category: General Sociology

SOCY 3161 (3) Sociological Perspectives on Race and Ethnicity

Addresses three subtopics of race from a sociological perspective: ethnic and racial identities, immigration, and race and ethnicity in Latin America.

Recommended: Prerequisite SOCY 1001 or SOCY 1021.

Additional Information: Departmental Category: General Sociology

SOCY 3171 (3) Whiteness Studies

Uses the conceptual framework of the sociology of race and ethnic relations to explore whiteness as a racial category that is centered and privileged in American society. Investigates the development of whiteness from past white supremacy, current colorblindness, to possible future multiculturalism. Analyzes the consequences of whiteness as a racial identity and a social structure.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Additional Information: Departmental Category: General Sociology

SOCY 3201 (3) Sociological Research Methods

Introduces students to the logics and methods of sociological research. This requirement for majors teaches ways to answer sociological questions by collecting and analyzing different types of data. Students are trained in research ethics and learn how to collect their own data and conduct original sociological research. Collection and analysis of both qualitative and quantitative data are included.

Requisites: Requires prerequisite course of SOCY 2061 or ANTH 4000 or EBIO 4410 or ECON 3818 or GEOG 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or EDUC 4716 (minimum grade C-). Restricted to Sociology (SOCY) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Sociology

SOCY 3301 (3) Survey Methods

Teaches quantitative research methods and, particularly, methods of survey research. Topics include sampling, interviewing, schedule construction, data analysis, computer methods, index construction, and statistical analysis. Students participate in a survey project, design, collect data, and prepare a research paper on the basis of collected data.

Requisites: Requires prerequisite courses of SOCY 2061 and SOCY 3001 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3314 (3) Violence Against Women and Girls

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3314 and WGST 3314

Recommended: Prerequisite SOCY 1016 or WGST 1016.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 3401 (3) Field Methods

Skill development prepares students to conduct qualitative sociological research. Emphasizes ethnographic techniques, including intensive interviewing, direct observation, coding, participant observation, and report writing. Students conceive and execute a field research project with data collection, analysis, and a report.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4000 (3) Gender, Genocide and Mass Trauma

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4010

Recommended: Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

Additional Information: Departmental Category: Sex and Gender

SOCY 4002 (3) Sociology of Aging

Studies present and future roles of the aged in the family, the community, and the larger society. Considers economic, political, and health consequences of various retirement systems.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: Population and Health Issue

SOCY 4004 (3) Advanced Topics in Criminology

Variety of courses in criminology. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4007 (3) Global Human Ecology

Examines global environmental issues from sociological perspectives. Focuses on such problems as overpopulation, world hunger and poverty, pollution, resource shortages, environmental impact of technology and population dynamics, public policy, and strategies for change.

Equivalent - Duplicate Degree Credit Not Granted: SEWL 2000

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: Environment and Society

SOCY 4010 (3) Sociology Capstone Course: Professional Writing

Builds on previous coursework in survey or field methods to result in an original, article-length research paper analyzing sociological data. Students will hone their writing skills through in- and -out-of-class writing exercises, and read and analyze models of quantitative and qualitative sociological articles to develop sociological writing skills.

Requisites: Requires a prerequisite course of SOCY 3301 or SOCY 3401 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: General Sociology

SOCY 4014 (3) Criminology

Examines the scientific study of types of criminal behavior and explanations for criminal behavior, with special attention to social factors affecting criminal behavior.

Requisites: Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4016 (3) Sex, Gender and Society 2

Studies status and power differences between the sexes at individual, group, and societal levels. Examines empirically established sex differences, and reviews biological, psychological, and sociological explanations for gender differences.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4016

Requisites: Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sex and Gender

SOCY 4017 (3) Animals and Society

Examines the role of non-human animals in human society. Investigates the social construction of the human/animal boundary. Challenges ideas that animals are neither thinking nor feeling. Examines the many ways humans rely on animals. Considers the link between animal cruelty and other violence. Explores the moral status of animals.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Additional Information: Departmental Category: Environment and Society

SOCY 4021 (3) Conflict Management in Social Systems

Explores conflict resolution theory and method as applied to interpersonal, intergroup, and interorganization conflict.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-).

Additional Information: Departmental Category: General Sociology

SOCY 4024 (3) Juvenile Justice and Delinquency

Examines the history, incidence and prevalence of delinquent behavior among youth.

Requisites: Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Deviance and Criminology

SOCY 4027 (3) Inequality, Democracy, and the Environment

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. Focuses on the role that global inequality plays in fostering environmental degradation.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4027

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Environment and Society

SOCY 4030 (3) Sociology of Climate Change

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4030

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Environment and Society

SOCY 4031 (3) Social Psychology

Studies individuals in social context. Reviews philosophical and sociological treatments of the relation between the individual and society. More specific topics include the socialization process, theories of human development and personality formation, language acquisition, conformity, aggression, sex differences in personality and gender identity, and the relation between attitudes and overt behavior.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4037 (3) Hazards, Disasters and Society

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 5037

Requisites: Requires a prerequisite course of SOCY 2077 (minimum grade D-).

Additional Information: Departmental Category: Environment and Society

SOCY 4042 (3) Economic Sociology

Defines relationship between economy and society; sociological approach to study of economic activity and organization; difference from the theoretical and methodological assumptions orienting the discipline of economics; tackles these questions in two ways: studies foundations as established in works of Smith, Marx, Weber, Polanyi, and Schumpeter, and considers current research in economic sociology, focusing on concepts of markets, networks, and embeddedness.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Sociology (SOCY) majors only.

Additional Information: Departmental Category: Population and Health Issue

SOCY 4047 (3) Topics in Environment and Society

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Environment and Society

SOCY 4052 (3) Social Inequalities in Health

Focuses on social inequalities in health in both U.S. and international contexts. Reviews the link between health status and various types of social statuses, including but not limited to socioeconomic status, gender, race and ethnicity. Explanations for the relationships between these factors and various health outcomes are discussed. Focuses on multiple levels of analysis, from the physician-patient interactions to health care systems and social policies. Students have the opportunity to develop their own specific research interests in this field.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Population and Health Issue

SOCY 4062 (3) Suffering and Care in Society

Examines how modern societies understand and respond to the reality of human suffering, how care systems are organized, and the experiences of professional caregivers.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Population and Health Issue

SOCY 4063 (3) Risk and Resilience in Society

Explores the growing dangers of modern life and the ability of society and its members to recover from epidemics, terrorism, financial disasters, natural catastrophes and other harmful events. Special attention is given to the social (as opposed to the individual) sources of risk and resilience and their implications for the helping professions.

Additional Information: Departmental Category: General Sociology

SOCY 4071 (3) Social Stratification

Studies theories of class, ethnic, sex, and age stratification. Examines social inequality in the United States and analyzes the resulting conflicts.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 5071

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4081 (1-3) Sociology of Education

Analyzes the school as a social organization. Among topics considered are power and control in the school; classroom interaction and its relation to learning and personality development in students; roles of educators; and reciprocal relations of school and community.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Sociology

SOCY 4084 (3) Punishment, Law and Society

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4084

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4086 (3) Family and Society

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic, and economic determinants of family formation.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4086

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: Sex and Gender

SOCY 4104 (3) The Death Penalty in America

Examines the historical and international use of capital punishment, and then focuses on its use and status in the United States in this century, with a special look at Colorado. Critically examines the arguments for and against capital punishment. The inmates on death row and their families will be examined, as well as the needs of families of homicide victims.

Requisites: Requires a prerequisite course of SOCY 4014 (minimum grade C-).

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4117 (3) Food and Society

Examines the food system along the lines of social justice and environmental sustainability. Investigates the institutional and cultural supports of major food system problems and contemporary efforts to address those problems, including the realms of food production, processing, distribution, marketing, policy, regulation, consumption, and activism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Environment and Society

SOCY 4121 (3) Sociology of Religion

Examines complex interactions between religious and other social structures, such as the economy, government, and the family, and how globalization is affecting religious traditions across the globe. Includes discussion of how various religions are used or misused to justify terrorism and other acts of violence.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: General Sociology

SOCY 4131 (1-3) Advanced Topics in Sociology

Variety of advanced specialty courses taught by visiting and regular faculty designed for upper division sociology majors. See current departmental announcement for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4132 (3) Gender, Islam and Modernity

Examines gender in contemporary Muslim societies, with emphasis on Asia and the Middle East. Explores issues such as veiling, feminism, sexuality, family, women's participation in politics and social movements.

Requisites: Requires prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

SOCY 4141 (3) The Social Psychology of Friendships

Studies friendships between individuals and groups, applying social psychological theories of interaction and group processes. Examines the effects of hierarchies of status and power and of norms and social pressure on friendships. Attempts to answer questions like how social categories like gender, race, and class affect friendships, what are the unwritten rules of behavior among friends in different situations, and what happens when we violate them.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4160 (3) Designing Social Innovations

Introduces students to theory and research on social entrepreneurship with special emphasis on the role of design thinking.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

SOCY 4161 (3) Executing Social Innovations

Introduces students to the skills and strategies involved in developing a business plan for a social business or an organization wanting to increase its social impact.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

SOCY 4441 (3) Senior Honors Seminar 1

Helps students design and initiate an honors thesis based on original sociological research.

Requisites: Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Arts Sciences Honors Course
Departmental Category: General Sociology

SOCY 4451 (3) Senior Honors Seminar 2

Helps students complete an honors thesis based on original sociological research. Emphasizes analyzing data, writing research reports, and presenting results.

Requisites: Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Arts Sciences Honors Course
Departmental Category: General Sociology

SOCY 4841 (1-8) Independent Study in Sociology

Upper-division variable credit. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4911 (1-3) Teaching Sociology

Students participate in a teaching seminar under the supervision of a faculty member. Includes pedagogical strategies for implementing concrete educational goals and encouraging higher levels of creativity and analysis in a large, lower-division class. Emphasizes mentorship and personal development. Instructor consent required.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4931 (1-6) Internship in Sociology

Provides an academically supervised opportunity for junior and senior sociology majors to work in public or private organizations to gain practical knowledge and experience, and allows students to make a connection between sociological theory and the "real world". Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4932 (3) Internship in Care, Health and Resilience

Provides an academically supervised opportunity for juniors and seniors interested in the helping professions to work in a job that provides them valuable hands-on experience, allows them to apply insights learned in their formal coursework and helps them make informed career choices upon graduation.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Population and Health Issue

Sociology - Bachelor of Arts (BA)

Sociology is the scientific study of human social behavior. It considers how society influences individuals, and how individuals influence society. Sociologists describe and explain the actions of persons, groups, organizations, classes, and entire societies. They also design and evaluate social programs and public policy. The study of sociology includes social theory, research methods, social stratification, race relations, social change, criminology, demography, gender roles, religion, social psychology, and the environment.

Students completing a BA in sociology will acquire the ability to:

- Locate and consult works relevant to a sociological investigation and write a high-quality sociological paper
- Understand the basic procedures of sociological research and analyze sociological data
- Understand and interpret the results of sociological research
Understand sociological concepts and Evaluate sociological writings

Requirements

Students must complete the graduation requirements of the College of Arts and Sciences and the required courses listed below. A minimum of 36 credit hours (but not more than 45) in sociology is required for the degree. Of the 36 credit hours, 21 must be upper division with a minimum of 15 upper-division credit hours of course work in the major taken on the Boulder campus. All required major courses must be completed with a grade of C- or better. The cumulative GPA required in sociology courses is 2.00.

In addition to formal course work, the degree offers opportunities for internships with various organizations, including social service agencies, the criminal justice system and non-profit organizations. There is also the opportunity to design and complete an honors thesis based on your own original research, as well as to work closely with one of our faculty members through the UROP program.

Required Courses and Credit Hours

SOCY 1001	Introduction to Sociology	3
SOCY 2061	Introduction to Social Statistics ¹	3
SOCY 3001	Classical Theory	3
SOCY 3201	Sociological Research Methods	3
Electives		24
Total Credit Hours		36

¹ A non-SOCY statistics course (C- grade or higher) can be used to substitute for SOCY 2061.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility (p. 127). The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in sociology, students should meet the following requirements:

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete SOCY 1001 and SOCY 3001 and 6 credit hours of sociology electives.
- By the end of the sixth semester, complete SOCY 2061 and SOCY 3201 and 15 credit hours of sociology electives (with a minimum of 9 of the 15 being upper-division credit hours).
- By the end of the eighth semester, complete 36 credit hours (but not more than 45), in sociology with at least 21 of those credit hours in upper-division courses.

Sociology - Minor

To declare a minor in sociology, students can attend a new majors/minors meeting, or they can email michael.lynn@colorado.edu (Michael.Lynn@colorado.edu) from their CU email account. Students will need to include their student ID number along with a request to add the SOCY minor.

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. A minimum of 18 credit hours in sociology is required for the minor. Of the 18 credit hours with a minimum of 9 upper division credit hours of course work taken on the Boulder campus. All minor courses must be completed with a grade of C- or better. The cumulative GPA required in sociology courses is 2.00.

Required Courses and Credit Hours

SOCY 1001	Introduction to Sociology	3
SOCY Electives		15
A minimum of 9 of the 15 credit hours of SOCY electives must be upper division		
Total Credit Hours		18

Care, Health and Resilience - Certificate

The Care, Health and Resilience certificate emphasizes the skills and practices necessary for careers in today's helping professions: nursing, medicine, counseling, ministry, community services, teaching, emergency management and related fields. These skills vary from the ability to nurture client's physical, emotional and/or social well-being to helping people thrive despite life-altering circumstances. The program will integrate a variety of occupational practices to give students the opportunity to explore career options through an internship experience.

Curriculum included in the certificate will:

- Provide students the opportunity to explore a variety of care-related occupations and the work experiences of their incumbents;
- Address the needs of suffering people and at-risk populations and will explore how society's understanding of the causes and consequences of human anguish have changed over time;
- Examine the ethical dilemmas posed by medical technologies and bureaucracies; and
- Link students to Colorado's only academic health sciences center, the University of Colorado Anschutz Medical Campus, and other local hospitals through its patient navigator internship program.

Requirements

The certificate is open to degree seeking and non-degree seeking CU Boulder undergraduates in good standing from any declared major. There is no GPA requirement for admission into the program, but students are required to achieve a C- or better in all coursework that applies toward the certificate.

Required Courses and Semester Credit Hours

Required Courses		
SOCY 1022	Ethics and Social Issues in U.S. Health and Medicine	3
SOCY 2080	Sociology of the Helping Professions	3

SOCY 4062	Suffering and Care in Society	3
SOCY 4063	Risk and Resilience in Society	3
Required Internship		
SOCY 4932	Internship in Care, Health and Resilience	3
Electives		
Choose one of the following:		
ANTH 4110	Human Evolutionary Biology	
ANTH 4610	Medical Anthropology	
ARSC 3001	Social Engagement & Human Rights: The South Africa Model	
ECON 4242	Urban Economics: The Economics of Cities	
ECON 4646	Topics in Health Economics	
ECON 4897	Economics of Organizations	
ENGL 1001	Freshman Writing Seminar	
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices	
GEOG 3692	Introduction to Global Public Health	
GEOG 3742	Place, Power, and Contemporary Culture	
GEOG 4852	Health and Medical Geography	
IPHY 2500	Perspectives in Health and Medicine	
INVS 3302	Facilitating Peaceful Community Change	
PHIL 1160	Introduction to Bioethics	
PHIL 3160	Bioethics	
PHIL 4110	Contemporary Moral Theory	
PSCI 3084	Diversity, Disagreement, and Democracy: an Introduction to the Theory and Practice of Democracy	
PSYC 2606	Social Psychology	
PSYC 3131	Human Emotion	
PSYC 3456	Psychology of Personality	
WGST 3400	Gender, Personality, and Culture	

- read sophisticated Spanish texts at a level at which literary and cultural analyses can be performed;
- write and speak Spanish sufficiently to participate in critical discussions and write critical essays;
- analyze and interpret texts in terms of themes, characters, structure, style and overall textual strategies;
- relate analysis and interpretations of different texts to one another; and
- communicate such interpretations competently in written form in Spanish.

The undergraduate degree in Spanish and Portuguese language and culture emphasizes knowledge and awareness of the same topics listed in the degree in Spanish language and literature, but specifies electives focusing on the culture of the Portuguese-speaking world and adding knowledge of the Portuguese language.

The undergraduate degree in Spanish for the professions emphasizes knowledge and awareness of:

- several professional practices including business, health, media and sustainable development practices as applied to the Spanish-speaking world;
- fundamental Professional Spanish terminology related to these areas;
- the cultural environment in which these professions are conducted in the Spanish-speaking world;
- basic disciplinary practices according to the canons of each discipline;
- best practices in cross-cultural communication; and
- best practices in the field of translation, interpretation and language services in the targeted professional areas.

In addition, students completing the degree in Spanish for the professions are expected to acquire the ability and skills to:

- read and interpret in cultural and professional-related terms sophisticated Spanish texts concerning business, health, media and sustainable development practices;
- write and speak Spanish sufficiently to communicate effectively on professional-related issues, and be involved in critical discussions and write critical essays on the subject;
- analyze a particular professional problem in order to place it in a relevant context and formulate an appropriate response; and
- adequately translate professional-related documents.

Course codes for these programs are SPAN and PORT.

Bachelor's Degree

- Spanish - Bachelor of Arts (BA) (p. 503)

Minors

- Portuguese Language and Culture - Minor (p. 503)
- Spanish - Minor (p. 506)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Spanish and Portuguese

The Spanish and Portuguese Department offers three major tracks and two minors. Language courses at the elementary and intermediate levels are also offered in Spanish, Portuguese and Catalan.

The department has identified the following as educational outcomes for the three tracks within the Spanish major.

The undergraduate degree in Spanish language and literature emphasizes knowledge and awareness of:

- the fundamental outlines of the history of literary and cultural expressions of the Spanish-speaking world;
- major creative writers in both Spanish and Spanish American literature;
- basic critical methodologies in the study of different genres ranging from fiction to poetry in a variety of textual forms, and from the written word to cinema, media and other visual arts; and
- the cultural and historical contexts in which Spanish-speaking societies developed.

In addition, students completing the degree in Spanish language and literature are expected to acquire the ability and skills to:

Baena, Julio (https://experts.colorado.edu/display/fisid_101497)
Professor; PhD, Georgetown University

Becher, Anne Helen (https://experts.colorado.edu/display/fisid_110035)
Senior Instructor; MA, University of Colorado Boulder

Brown, Esther Lynn (https://experts.colorado.edu/display/fisid_129298)
Associate Professor; PhD, University of New Mexico

Dabove, Juan Pablo (https://experts.colorado.edu/display/fisid_125397)
Associate Professor; PhD, University of Pittsburgh

Elmore, Peter Michael (https://experts.colorado.edu/display/fisid_103089)
Professor; PhD, University of Texas at Austin

Gomez, Leila Gabriela (https://experts.colorado.edu/display/fisid_133563)
Associate Professor; PhD, Johns Hopkins University

Green, Antonia M (https://experts.colorado.edu/display/fisid_103344)
Instructor; MA, University of Missouri-Columbia

Hallstead, Susan Rita (https://experts.colorado.edu/display/fisid_125579)
Senior Instructor; MA, University of Pittsburgh

Herrero-Senes, Juan (https://experts.colorado.edu/display/fisid_147159)
Associate Professor; PhD, Univ Pompeu Fabra (Spain)

Horno-Delgado, Asunción
Professor Emeritus; PhD, University of Massachusetts Amherst

Kopen, Carmen Lynn (https://experts.colorado.edu/display/fisid_127181)
Instructor; MA, University of Colorado Boulder

Krael, Javier (https://experts.colorado.edu/display/fisid_143248)
Associate Professor; PhD, Duke University

Long, Mary K (https://experts.colorado.edu/display/fisid_109994)
Senior Instructor; PhD, Princeton University

Malcolm, Karen L (https://experts.colorado.edu/display/fisid_108575)
Instructor; MA, University of Nebraska-Lincoln

Martuscelli, Tania A. (https://experts.colorado.edu/display/fisid_148379)
Assistant Professor; PhD, University of Massachusetts at Amherst

Molinaro, Nina L (https://experts.colorado.edu/display/fisid_105143)
Associate Professor; PhD, University of Kansas

Perez-Pamies, Susanna (https://experts.colorado.edu/display/fisid_147675)
Instructor

Prieto, Andres Ignacio (https://experts.colorado.edu/display/fisid_143948)
Associate Professor; PhD, University of Connecticut

Rivas Rodriguez, Jose Javier (https://experts.colorado.edu/display/fisid_144516)
Associate Professor; PhD, Univ of Santiago De Compostela (Spain)

Schincariol, Marcelo Tadeu (https://experts.colorado.edu/display/fisid_148724)
Instructor

Silleras-Fernandez, Nuria (https://experts.colorado.edu/display/fisid_147213)
Associate Professor; PhD, Univ Autonoma De Barcelona - UAB (Spain)

Tabler, Alicia V (https://experts.colorado.edu/display/fisid_104217)
Instructor; BA, University of Wyoming

Courses

Portuguese

PORT 1010 (5) Beginning Portuguese 1

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Portuguese

PORT 1020 (5) Beginning Portuguese 2

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil. Continuation of PORT 1010. Department enforced prerequisite: PORT 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Portuguese

PORT 2110 (3) Second-Year Portuguese 1

Involves practice in speaking, listening comprehension, reading and writing at an intermediate level. Explores relevant topics of the Brazilian culture through different media. Besides introducing grammar topics corresponding to the intermediate level of the Portuguese languages, it includes grammar review (PORT 1010 and PORT 1020) and extra work on vocabulary acquisition. Department enforced prerequisite: PORT 1020 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages
Arts Sci Core Curr: Foreign Language
Departmental Category: Portuguese

PORT 2120 (3) Second-Year Portuguese 2

Includes practice in speaking, listening comprehension, reading and writing at intermediate level, based on the Communicative Approach. Includes grammar and extra work on vocabulary acquisition, both explored through literary texts by renowned authors of the Portuguese speaking world, with a focus on Brazilian literature.

Additional Information: Departmental Category: Portuguese

PORT 2350 (3) Portuguese for Romance Language Speakers

Focusing on Brazilian Portuguese, this course constitutes an intensive introduction to Portuguese language for those who speak a Romance language. Comprehends basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Uses different media to explore cultural aspects of the Portuguese speaking world.

Recommended: Requisite three semesters of college equivalent in any Romance language.

Additional Information: Departmental Category: Portuguese

PORT 2800 (3) Brazil: Past and Present

Discusses contemporary Brazil through the lenses of its literary, as well as socio-political movements. Students acquire a broader perspective of the country's current dynamics based on the formation of its national identity from 1500 to today. History serves as background to analyze literature and arts and critically understand Brazilian culture. Taught in English. Does not count toward Portuguese minor or Spanish and Portuguese major.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Portuguese

PORT 3003 (3) Advanced Portuguese Language Skills

Consists of an advanced language course focused on current socio-environmental issues in Brazil. Involves reading academic texts of different areas of study, writing essays, watching documentaries, conducting class presentations and discussions and studying grammar and vocabulary in the context of a more sophisticated written Portuguese.

Requisites: Requires prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 3220 (3) Latin American Culture: Spanish America and Brazil

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present. Taught in Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 3220

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Recommended: Prerequisites PORT 2110 and PORT 2120.

Additional Information: Departmental Category: Portuguese

PORT 3230 (3) Transatlantic Relations in the Portuguese Speaking World

Examines cultural movements in Brazil, Portugal and Portuguese-speaking Africa, from the 15th century period of Portuguese expansion to the postcolonial present. Includes articles on culture as seen through literary, artistic, historical and sociological lenses. Taught in Portuguese.

Requisites: Requires prerequisite courses of PORT 2110 and PORT 2120 and PORT 2350 (all minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 3270 (3) Socio-Environmental Dynamics in Brazil

Gives students the opportunity to immerse themselves in the language, culture and contemporary realities of rural Maranhao, Brazil. Explores some of the most pressing issues in Brazil today with focus on sustainable development, environmental governance and social entrepreneurship.

Requisites: Requires a prerequisite course of PORT 2110 or PORT 2350 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Portuguese

PORT 4110 (3) Brazilian Literature

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays is included.

Equivalent - Duplicate Degree Credit Not Granted: PORT 5110

Requisites: Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 4150 (3) Literature of the Portuguese Speaking World

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

Equivalent - Duplicate Degree Credit Not Granted: PORT 5150

Requisites: Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 4230 (3) Special Topics in Luso-Brazilian and/or African Literature

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese colonization. Taught in Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 4230

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Portuguese

PORT 4840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Portuguese

Spanish**SPAN 1000 (3) Cultural Difference through Hispanic Literature**

For freshmen only. Organized around the general topic of cultural differences. Focuses on a related issue such as gender or history articulated in the literature of Spain, Latin America, and the Hispanic United States. Taught in English; students read selected literary texts in English from the various traditions. Does not count towards the Spanish major.

Requisites: Restricted to students with 0-26 credits (Freshmen) only.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 1010 (5) Beginning Spanish 1

Offers students a firm command of Spanish grammar. Grammar is used as a point of departure for development of oral skills. Reading and writing are stressed to a lesser degree. Attendance at the language laboratory may be mandatory.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 1150

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Spanish

SPAN 1020 (5) Beginning Spanish 2

Continuation of SPAN 1010. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1010 (min. grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SPAN 1150

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Spanish

SPAN 1150 (5) Intensive First Year Spanish

An intensive beginning course covering the same material as SPAN 1010 and 1020. Attendance at the language laboratory may be mandatory.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 1010 and SPAN 1020 SPAN 1010

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Spanish

SPAN 2110 (3) Second-Year Spanish 1

Grammar review. Emphasizes reading, writing, and speaking skills. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1020 (min. grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SPAN 2150

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages
Arts Sci Core Curr: Foreign Language
Departmental Category: Spanish

SPAN 2120 (3) Second-Year Spanish 2

Grammar review. Emphasizes reading, writing and speaking skills. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 2110 (min. grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SPAN 2150

Additional Information: Departmental Category: Spanish

SPAN 2150 (5) Intensive Second-Year Spanish

Intensive review of grammar and other subjects covered in SPAN 2110 and SPAN 2120. Attendance at the language laboratory may be mandatory.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 2110 or SPAN 2120 SPAN 2110

Requisites: Requires prerequisite course of SPAN 1020 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages
Arts Sci Core Curr: Foreign Language
Departmental Category: Spanish

SPAN 2450 (3) Catalan for Spanish Speakers

Offers an intensive introduction to the Catalan language for those able to speak Spanish. By the end of the course students should be able to communicate well in all language-skills areas: listening comprehension, speaking, reading and writing. Students will also have gained a better understanding and appreciation of the Catalan singularity.

Recommended: Prerequisite SPAN 3000 or placement or five semesters of college Spanish or department consent required.

Additional Information: Departmental Category: Spanish

SPAN 3000 (5) Advanced Spanish Language Skills

Transitional course that introduces students to the Spanish major and improves their writing skills. Involves composition, reading, and to a lesser extent, conversation.

Requisites: Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3001 (3) Spanish Conversation

Emphasizes vocabulary acquisition and speaking fluency. Through structured and carefully monitored individual, group, and class work, students achieve enduring language growth and meaningful acculturation that otherwise could only be achieved through an extended stay in an Hispanic country. This course is intended for those who are learning Spanish as a second-language. Native speakers of Spanish who have pursued formal education in a Spanish speaking country will not be admitted to the course. Heritage speakers of Spanish (native speakers who have pursued formal education in a non-Spanish speaking setting) as well as students from bi-lingual K-12 programs must meet with the coordinator to determine appropriate class level. Does not count toward the Spanish major or minor.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 3002

Requisites: Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3002 (3) Advanced Spanish Conversation

Focuses on refining fluency in both informal and formal discourse through group discussions, class work and individual and group presentations in order to prepare students for communication in professional settings. To that end, the materials used in the course will emphasize themes and problems relevant to the contemporary Hispanic world.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 3001

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3010 (3) Advanced Rhetoric and Composition

Designed to refine expository and argumentative writing in Spanish, this course will center around four main areas of study: culture, linguistics, sociopolitical and economic reality, and literature and criticism. A multi-draft process-based approach will guide the writing and revision of essays. Additionally, there will be a focus on grammar and lexical issues most challenging for students at the third-year level.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Spanish

SPAN 3030 (3) Professional Spanish for Business 1

Includes the study of business vocabulary, business concepts, geographic context, and cultural context.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3040 (3) Professional Spanish for Business 2

Complements SPAN 3030 with a focus on different business topics and countries. Emphasizes interpreting and elementary translation. Attention is given to the writing of resumes and application letters, as well as the entire job search process.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3050 (3) Spanish Phonology and Phonetics

Designed to teach some of the methods, techniques, and tools of descriptive linguistics as they apply to articulatory phonetics. Students analyze important contrasts between sounds of Spanish and English by means of phonetic transcription.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3060 (3) Spanish for Careers in Environmental Studies and Sustainable Development

Provides advanced Spanish language competency and transcultural knowledge of issues pertaining to the environment, energy and sustainable development in the Spanish-speaking world. Students will develop a critical apparatus for analyzing, reading, listening, speaking and writing about the social, cultural and economic parameters of these countries and the U.S.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 3070 (3) Spanish 21st Century Media Professions

Develops advanced Spanish language skills, trans-cultural knowledge and regional and historical understanding necessary for using Spanish in media related professions. Examines the production, representations and cultural meaning of Hispanic and Latino media within the United States and globally drawing on films, videos and readings in political economy, cultural studies, history and sociology. Students create five media products in Spanish.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 3080 (3) Spanish Health Professions

Develops advanced Spanish language competency and trans-cultural knowledge and skills for health related contexts both in the United States and abroad in order to develop a critical apparatus for analyzing, reading, listening, speaking and writing about health and understanding health fields in historical and sociocultural contexts of the Spanish speaking world.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 3100 (3) Literary and Cultural Analysis in Spanish

Fosters critical thinking and the ability to discuss texts from a historical, sociological, ideological and formalistic viewpoint. Analyzes literary and cultural expressions from Latin America, Spain and the US Latino traditions in different genres, ranging from fiction to poetry, and media from the written word to cinema and other visual arts.

Additional Information: Departmental Category: Spanish

SPAN 3120 (3) Advanced Spanish Grammar

Analysis of texts from morphological and syntactic perspectives. Structural and semantic characteristics of major features of Spanish are studied at the sentence level. Use of these grammatical features is then studied in selected literary texts.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3150 (3) Linguistic Analysis of Spanish

Introduces students to fundamental areas of linguistic analysis with special attention paid to Spanish (and Portuguese). The structural systems of language will be introduced (principles of sound patterns, word formation, meaning, and sentence structure). Different types of language variation will be discussed (historical, social, regional).

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3200 (3) Spanish Culture

Examines historical bases of modern Spain's cultural and political currents. Department enforced prerequisite: SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 3215 (3) Urban History and Culture in the Spanish-Speaking World

Understanding the complex history, social fabric, material life and cultural diversity of Latin American and Iberian cities is the goal of this course, which in its iterations will be devoted to analyzing and discussing different urban centers on either side of the Atlantic Ocean. Materials from a wide variety of media and genres such as literature, visual arts, historiography, film, will be used. Taught in Spanish.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3220 (3) Latin American Culture: Spanish America and Brazil

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present.

Equivalent - Duplicate Degree Credit Not Granted: PORT 3220

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3230 (3) Discovering Barcelona: Culture and Heritage

Presents more than 2,000 years of Barcelona's cultural heritage in the city of Barcelona from the Romans to the present. We will read works by locals and foreign authors to understand how the city has been a hub of the European and Mediterranean cultures for centuries. A faculty sponsored Global Seminar to Barcelona, Spain, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

Additional Information: Departmental Category: Spanish

SPAN 3240 (3) Catalan Culture 1: Nation and Art

Introduces students to the literary, artistic and historical currents of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people, its capital Barcelona, and a distinct culture and language. Examines national identity and major works from renowned Catalan artists, spanning architecture, painting and literature, like Dali, Gaudi, or Miro. Department enforced prerequisite: SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 3250 (3) Catalan Culture 2: Contemporary Trends and Barcelona

Introduces students to the contemporary social and cultural trends of Catalonia as they take place mainly in its capital Barcelona. Examines current developments in fields such as theatre, art, fashion, cooking, urban design or architecture. Department enforced prerequisite: SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 3260 (3) Late 19th and 20th Century Argentine Narrative

Considers a series of late 19th and 20th century canonical works from several genres (poetry, short story, essay, and the novel). Students will acquire a very specific knowledge of late 19th and 20th century Argentine literature, its relationship to specific social actors and specific historical processes. A faculty sponsored Global Seminar to Rosario, Argentina, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 3270 (3) Barcelona: Understanding Local and Immigrant Cultures

Explores the history of Barcelona, a cosmopolitan city that is one of the oldest in Europe, from an interdisciplinary, European perspective that emphasizes the city's cultural diversity and pluralism. A range of historical, literary, artistic, and sociological texts will be examined. Taught in Spanish. Offered through the Study Abroad program. Department enforced prereq., SPAN 3000.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Spanish

SPAN 3280 (3) Introduction to Catalan Literature & Film

Introduces students to the rich and diverse literary and film traditions of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people and a distinct culture and language. Department enforced prerequisite: SPAN 3000 or equivalent. Course taught in Spanish.

Additional Information: Departmental Category: Spanish

SPAN 3310 (3) 20th Century Spanish Literature

Surveys leading writers of Spain from 1898 until the present.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3340 (3) 20th Century Spanish American Literature

Introduces contemporary Spanish American literature.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3700 (3) Selected Readings: Spanish Literature in Translation

Introduces selected Spanish literature masterpieces. Taught in English. Will not count toward major requirements.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 3800 (3) Selected Readings: Latin American Literature in Translation

Introduces selected Latin American (Spanish and Portuguese) literature masterpieces. Taught in English. Does not count toward the Spanish major.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 4060 (3) Problems of Translation for Professions in Spanish 1

Develops skills in English-Spanish and Spanish-English translation and interpretation.

Requisites: Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4070 (3) Problems of Translation for Professions in Spanish 2

Presents documents from different professional areas (business, health, media and environmental studies and sustainable development) which are studied, prepared, translated and discussed in context in order to enable students to perform successfully in real translation situations.

Requisites: Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4110 (3) Hispanic Women Writers

Discusses the image of women in Spanish literature through the centuries using works by representative female writers.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4120 (3) Literature and Cinema in Spain and Latin America

Studies film and fiction in different periods and about main topics of the Hispanic world. It will provide a historical and cultural overview, introduce students to film theory, narrative theory and the vocabulary associated with both, and integrate critical texts about all the material studied.

Topics may vary each semester. This course will be taught entirely in Spanish.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4130 (3) The Power of Storytelling: Oral, Textual and Digital Narratives

Examines the ways in which oral, textual and digital narratives have shaped, and continue to shape, our lives and the different communities we inhabit. Looks at stories of the Spanish tradition produced in a variety of historical settings and across different media.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 4150 (3) Major Works and Trends in Literature and Culture in Spain Up to 1700

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from its origins to the end of the Baroque period.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4160 (3) Major Works and Trends in Literature and Culture in Spain: 1700-Present

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from 1700 to the present day.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4170 (3) Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century

Examines major works and trends in literature, visual arts and/or other cultural expressions of Latin America from the colonial period to the end of the 19th century.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4180 (3) Major Works and Trends in Literature and Culture in Latin America: 1900-Present

Examines major works of literature, visual arts and/or other cultural expressions of Latin America from the beginning of the 20th century to the present day.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4215 (3) Spanish in the United States

Describes the linguistic characteristics of U.S. Spanish, Spanish-English bilingualism and direct contact, including the study of borrowing, code switching, phonological and grammatical convergence, leveling, accommodation and attrition, among other linguistic phenomena.

Discusses the relationships between language and identity, as well as the role of Spanish in U.S. education, media and social institutions.

Requisites: Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 4220 (1-3) Special Topics in Spanish and/or Spanish American Literature

Examines intensively particular topics or issues concerning Spanish and/or Spanish American literature selected by the instructor.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4230 (3) Special Topics in Luso-Brazilian and/or African Literature

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4430 (3) Special Topics in Hispanic Linguistics

Examines intensively particular topics or issues concerning Hispanic linguistics selected by the instructor.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4450 (3) Introduction to Hispanic Linguistics

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5450

Requisites: Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4620 (3) Cervantes

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4650 (3) Methods of Teaching Spanish

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5650

Requisites: Requires a prerequisite course of SPAN 3000 and SPAN 3010 and SPAN 3002 or SPAN 3030 or SPAN 3040 or SPAN 3050 or SPAN 3150 or SPAN 3200 or SPAN 3220 or SPAN 3240 or SPAN 3250 or SPAN 3280 or SPAN 3310 or SPAN 3340 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4660 (6) High School Spanish Teaching

Part of supervised secondary school teaching required for state certification to teach Spanish. These hours do not count toward student hours in the major nor in the total departmental hours allowed. Pass/Fail only.

Requisites: Requires prerequisite course of SPAN 4650 or SPAN 5650 (minimum grade D-).

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Spanish

SPAN 4840 (1-3) Independent Study

Departmental approval required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 4930 (1-4) Languages Internship for Professions

Participants interested in public service or management-oriented careers in government or business are able to work as interns in public sector agencies or in private industry, on campus, or abroad.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3200 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4980 (1) Methods Language Learn/Pedagogy

Required, intensive mini-course for teaching assistants in Spanish and Portuguese. Provides teachers with the opportunity to learn about language learning theory and pedagogy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 4990 (3) Spanish Honors Thesis

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: 18 hours of upper-division Spanish, 3.00 GPA overall, and 3.50 GPA in Spanish.

Additional Information: Arts Sciences Honors Course
Departmental Category: Spanish

Portuguese Language and Culture - Minor

The Portuguese minor focuses on Brazilian Portuguese, but provides the students with knowledge of the Portuguese-speaking world and the relations between the different national contexts where the language is spoken. The courses were designed to cover a variety of topics that are relevant to Brazil and other Portuguese-speaking countries. Students acquire a wider comprehension of Portuguese in a multi-cultural context.

The topics of the courses range from language to literature, from academic writing to performing arts; from sixteenth century letters on colonial issues to contemporary issues of biodiversity; from documentary films to soap operas; from nineteenth century Brazilian opera to twenty-first century *funk ostentação*.

The professors in the Portuguese program incorporate their international research into their teaching. The innovative pedagogical approaches aim at students' cultural intelligence, more than just language fluency.

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements

Declaration of a minor in Portuguese is open to any student enrolled at CU Boulder, regardless of college or school. To declare the Portuguese Minor make an appointment with the Spanish and Portuguese Department Professional Advisor (<http://www.colorado.edu/mycuhub>).

The Minor in Portuguese consists of 18 credits, a grade of C- or better for a course to apply to requirements, and a cumulative GPA for Portuguese courses of at least 2.0.

Transfer credit must be approved by the Associate Chair for Undergraduate Studies. A maximum of two courses can be taken abroad; this may be in addition to transfer credits. Study Abroad courses must be approved; contact the Spanish and Portuguese Department Professional Advisor (<http://www.colorado.edu/mycuhub>) to begin the process.

Required Courses and Credit Hours

Required Courses

PORT 2110	Second-Year Portuguese 1	3
or PORT 2350	Portuguese for Romance Language Speakers	
PORT 2120	Second-Year Portuguese 2	3
PORT 3003	Advanced Portuguese Language Skills	3
PORT 3230	Transatlantic Relations in the Portuguese Speaking World	3
PORT 4110	Brazilian Literature	3
PORT 4150	Literature of the Portuguese Speaking World	3

Suggested Course

PORT 3270	Socio-Environmental Dynamics in Brazil (this is a faculty-sponsored global seminar in the Amazon, Maranhão and/or Bahia, and is offered through the Study Abroad Program)
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Total Credit Hours

18

Spanish - Bachelor of Arts (BA)

The Department of Spanish and Portuguese offers three different major tracks.

Spanish Language and Literature Track

This track emphasizes knowledge and awareness of:

- the fundamental outlines of the history of Spanish literature and of Spanish American literature;
- the major creative writers in both Spanish and Spanish American literature;
- basic critical methodologies in the study of poetry, drama, narrative fiction and nonfiction; and
- the cultural and historical contexts in which Spanish-speaking societies developed.

In addition, students completing this track are expected to acquire the ability and skills to:

- read sophisticated Spanish texts at a level at which literary analysis can be performed;
- write and speak Spanish sufficiently to participate in critical discussions and write critical essays;
- analyze and interpret texts in terms of themes, characters, structure, style and overall textual strategies;
- relate analysis and interpretations of different texts to one another; and
- communicate such interpretations competently in written form in Spanish.

Spanish and Portuguese Language and Culture Track

This track focuses on the literature and culture of Spanish-speaking and Lusophone countries, guiding students through readings on the history of Spain, Portugal, Brazil and Latin America. Along with major authors and literary movements of the Spanish and Portuguese-speaking world, students read a variety of complex texts across academic disciplines.

The linguistic and cultural mastery of Spanish and Portuguese is key in opening endless possibilities to the European Union (Portugal and Spain), as well as Brazil and the whole of Latin America. Through this bilingual combination, students will gain the tools needed to conduct business in the Western Hemisphere in today's competitive global market.

Spanish for the Professions Track

This track emphasizes knowledge and awareness of:

- modern business practices as applied to the Spanish-speaking world;
- the theories of economics, business law and international trade and finance;
- fundamental business Spanish terminology;

- the cultural environment in which business is conducted in the Spanish-speaking world;
- basic business according to the canons of this discipline; and
- international relationships.

In addition, students completing the degree in international Spanish for the professions are expected to acquire the ability and skills to:

- read and interpret in cultural and business-related terms sophisticated Spanish texts concerning business transactions;
- write and speak Spanish sufficiently to communicate effectively on business-related issues, be involved in critical discussions and write critical essays on the subject;
- analyze a particular business problem to place it in a relevant context and formulate an appropriate response; and
- adequately translate business-related documents.

Study Abroad

The department strongly recommends that all majors include some study in a Spanish-speaking country in their major program. The university cooperates with full-year and semester programs in Argentina, Bolivia, Chile, Costa Rica, Dominican Republic, Ecuador, Mexico, Nicaragua, Panama and Spain. There are also programs in Brazil and Portugal for Portuguese speakers. The Spanish and Portuguese Department also offers Global Seminars. Credit earned normally counts toward satisfaction of the major requirements, but the student should see the Professional Undergraduate Advisor before enrolling in a foreign program to discuss transfer of credit. Credit for work done in special programs offered by foreign universities is evaluated on an individual basis. It should be noted that courses taken abroad and designated as Spanish are also subject to the 45-hour maximum rule of the College of Arts and Sciences.

Students who present transfer work or credit earned in CU study abroad programs to satisfy major requirements are expected to complete at least 12 upper-division credits on the Boulder campus, including SPAN 3100. For the Spanish Language and Literature and Spanish and Portuguese Language and Culture majors, at least 6 must also be from the 4000-level "Major Works and Trends" courses listed above. For Spanish for the Professions, students must take at least 2 of the 3000-level profession courses and SPAN 4070 on the Boulder campus.

Concurrent Degree Program BA/MSIB in Spanish

This program is designed for students who wish to combine their BA in Spanish for the Professions with a 1-year MS in international business (MSIB) from the University of Colorado Denver. Students seeking this option should complete the Leeds Business Minor.

Admission Procedures: Students apply for the MSIB program during their third year by declaring their intention to the Spanish for the professions faculty director, submitting the standard MSIB application forms, and completing admissions requirements, which include the GMAT (Graduate Management Admissions Test). Students are notified of acceptance to the program before the start of their fourth year. Students must have at least a 3.00 GPA to be considered for admission.

Requirements

Please note that the following applies to all the major tracks:

- The College of Arts and Sciences does not allow more than 45 credit hours in any one discipline to be counted toward the 120 credit hours required for a BA degree. This rule does not mean that a student may not take more than 45 credit hours in Spanish, but rather that one must have at least 75 credit hours in courses other than Spanish. PORT 2120 will be accepted as partially fulfilling upper-division courses in other foreign languages. No Spanish or approved area courses with a grade lower than a C- will be counted in the major requirements. The ancillary GPA (made up of the combined grades from area courses) must be at least 2.00.
- To fulfill the requirements for any major track, students must complete at least 12 upper-division credits at CU-Boulder. For Spanish Language and Literature and the Spanish and Portuguese Language and Culture, 9 of the 12 credits must be from the major works/trends courses listed previously (SPAN 4150 or SPAN 4160, and SPAN 4170 or SPAN 4180) and SPAN 3100. For the Spanish for the Professions major, students must take at least 2 of the 3000-level profession courses and SPAN 4070 and SPAN 3100 on the Boulder campus.
- No more than 3 independent study credit hours may count toward the major.
- No grade lower than C- in a Spanish course will be counted in the major requirement.
- Please note that students seeking Colorado State Teaching Certification should complete the Spanish Language and Literature Track. Students seeking teaching certification in Spanish must take certain classes. For full requirements, please contact the Advisor for the Secondary Spanish Teaching Certificate program in the department.
- Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. All Spanish majors are encouraged to consult with Spanish and Portuguese Department Professional Advisor (<http://www.colorado.edu/mycuhub>) before they register each semester.

Spanish Language and Literature Track

Required Courses

SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3010	Advanced Rhetoric and Composition	3
or SPAN 3120	Advanced Spanish Grammar	

Hispanic Linguistics Requirement

SPAN 3050	Spanish Phonology and Phonetics	3
or SPAN 315	Linguistic Analysis of Spanish	
or SPAN 443	Special Topics in Hispanic Linguistics	
or SPAN 445	Introduction to Hispanic Linguistics	

4000-level Spanish Language and Literature courses

<i>Spanish Literature and Culture</i>		
SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	
or SPAN 4160	Major Works and Trends in Literature and Culture in Spain: 1700-Present	
<i>Latin American Literature and Culture</i>		
SPAN 4170	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	
or SPAN 4180	Major Works and Trends in Literature and Culture in Latin America: 1900-Present	

Additional 4000-level Spanish Literature course

Choose one of the following courses not used to fulfill an above requirement:

SPAN 4110	Hispanic Women Writers	
	or SPAN 415 Major Works and Trends in Literature and Culture in Spain Up to 1700	
	or SPAN 416 Major Works and Trends in Literature and Culture in Spain: 1700-Present	
	or SPAN 417 Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	
	or SPAN 418 Major Works and Trends in Literature and Culture in Latin America: 1900-Present	
	or SPAN 422 Special Topics in Spanish and/or Spanish American Literature	
	or SPAN 462 Cervantes	

Upper-Division Spanish Electives 9

9 credit hours of upper-division SPAN electives. 3 credit hours must be 4000-level. Can include courses not used to fulfill an above requirement.

Total Credit Hours 32

Spanish and Portuguese Language and Culture Track

Note that prerequisites for the program include sufficient Spanish knowledge to be admitted to 3000-level courses and sufficient knowledge of Portuguese to be admitted to 2000-level courses.

Required Courses

PORT 2110	Second-Year Portuguese 1	3
	or PORT 2350 Portuguese for Romance Language Speakers	
PORT 2120	Second-Year Portuguese 2 (or SPAN/PORT upper-division)	3
PORT 3003	Advanced Portuguese Language Skills	3
	or PORT 3220 Latin American Culture: Spanish America and Brazil	
	or PORT 3230 Transatlantic Relations in the Portuguese Speaking World	
4000-level PORT course		3

Required Spanish Language and Literature Courses

SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3010	Advanced Rhetoric and Composition	3
	or SPAN 3120 Advanced Spanish Grammar	

Hispanic Linguistic Requirement 3

Choose one of the following:

SPAN 3050	Spanish Phonology and Phonetics	
	or SPAN 315 Linguistic Analysis of Spanish	
	or SPAN 443 Special Topics in Hispanic Linguistics	
	or SPAN 445 Introduction to Hispanic Linguistics	

Spanish Literature and Culture Course 3

SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	
	or SPAN 416 Major Works and Trends in Literature and Culture in Spain: 1700-Present	

Latin American Literature and Culture Course 3

SPAN 4170	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	
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or SPAN 418 Major Works and Trends in Literature and Culture in Latin America: 1900-Present

SPAN or PORT Elective. Upper division (3xxx/4xxx) SPAN or PORT literature, culture and/or language. 3

Total Credit Hours 35

NOTE: Directly-related courses outside of the department, such as ANTH 4730, may replace 3 hours of Spanish or Portuguese elective credits. These courses must be pre-approved by the department.

Native speakers of Portuguese, and in general, all students whose Portuguese skills are beyond the PORT 2120 level, are not required to take Portuguese lower-division courses. However, students have to make up these credit hours by taking 6 hours of upper-division SPAN or PORT courses or any related courses outside the department. Related courses must be approved by the department.

Spanish for the Professions Track

The department offers an interdisciplinary major in Spanish for the Professions which includes the completion of 12 credits in a professional field, in a second major or in a second degree. It offers students numerous career possibilities, both in government and private industry at home and abroad. Those choosing this major are not able to enter the CU-Boulder graduate program in Spanish without fulfilling the requirements in the language and literature major.

NOTE: Prerequisites for the program include sufficient Spanish to be admitted to 3000-level courses and any pertinent pre-requisites for the 12 credits of professional field. SPAN 4070 must be taken at CU-Boulder.

Professional Spanish Courses ¹ 9

Choose three of the following:

SPAN 3030	Professional Spanish for Business 1	
SPAN 3060	Spanish for Careers in Environmental Studies and Sustainable Development	
SPAN 3070	Spanish 21st Century Media Professions	
SPAN 3080	Spanish Health Professions	

6 Credit Hours - Required

SPAN 4060	Problems of Translation for Professions in Spanish 1	3
SPAN 4070	Problems of Translation for Professions in Spanish 2	3

Spanish Language Courses

SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3010	Advanced Rhetoric and Composition	3
	or SPAN 3120 Advanced Spanish Grammar	

Upper-division SPAN elective 3

Any SPAN 4000-level course. SPAN 4930 is an option. Upper Division Elective 3

Students are required to take 12 credit hours outside of Spanish in a certificate program, minor, second major or degree related to their professional interests. Students must fulfill the pre-requisites for the relevant program. The Business Minor, or the Public Health Certificate, or the Technology, Arts and Media Certificate are recommended. Courses meeting this requirement must be approved by the faculty director of the major. 12

Total Credit Hours 44

¹ No substitutions permitted.

Spanish - Minor

The Department of Spanish and Portuguese's minor in Spanish will help students gain an understanding of the Spanish language, as well as a grasp of main cultural concepts, practices and current literary and cultural trends.

In a global economy and competitive market environment, a Spanish minor adds value to an existing CU degree. Cultural and linguistic competence broadens a student's understanding of the nuances and complexities of today's world. Spanish, Portuguese and English are the most spoken languages in the Western Hemisphere.

Requirements

The minor in Spanish consists of 20 credit hours. A maximum of 9 credits, with no more 6 upper-division credits, can be transferred from other US institutions toward the minor. A maximum of 6 credits can be taken abroad; this may be in addition to transfer credits.

Required Courses and Credit Hours

Required Courses

SPAN 2120	Second-Year Spanish 2 ¹	3
or SPAN 2150	Intensive Second-Year Spanish	
SPAN 3000	Advanced Spanish Language Skills ²	5

Electives

Twelve upper-division credits from any course offered by the department and taught in Spanish ³ 12

¹ If students take SPAN 2150 instead of SPAN 2120, only 3 out of the 5 credits from SPAN 2150 will be counted toward the minor.

² Students who test into SPAN 3000 (i.e., who do not need to take SPAN 2120) must take 15 upper-division credits instead of 12.

³ Courses below SPAN 2120 do not count toward the minor, nor does SPAN 3001. SPAN 3100 is not required for the minor, but it is a prerequisite for all 4000-level literature courses.

Speech, Language and Hearing Sciences

The undergraduate program in speech, language and hearing sciences (SLHS) introduces concepts basic to human communication and provides opportunities for students to acquire an understanding of normal and disordered speech, language and hearing processes. The curriculum for the undergraduate degree in SLHS provides a strong academic foundation for students interested in a wide variety of careers related to the fields of disabilities, healthcare, and education. Additionally, it provides the appropriate undergraduate background for students interested in continuing onto graduate school in speech pathology, audiology and/or special education.

The undergraduate degree in speech, language and hearing sciences emphasizes knowledge of:

- the anatomy of the speech and hearing mechanisms, as well as the processes of speech production, transmission and reception;
- the development of language;

- scientific methods used in investigating speech/language/learning and hearing processes;
- the etiologies, characteristics and treatments of speech/language/learning and hearing disorders; and
- the role of the professional speech-language pathologist and audiologist, including the scientific traditions of the discipline and the ethical issues in providing service to individuals with communication disorders.

In addition, students completing the degree in speech, language and hearing sciences are expected to acquire the ability and skills to:

- express themselves effectively both orally and in written scientific and clinical discipline-specific reports;
- critically evaluate literature in the discipline; and
- analyze the acoustic output of the speech production process auditorily and/or instrumentally.

Course code for this program is SLHS.

Bachelor's Degree

- Speech, Language and Hearing Sciences - Bachelor of Arts (BA) (p. 509)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Arehart, Kathryn H (https://experts.colorado.edu/display/fisid_105561)
Professor; PhD, University of Washington

Brennan, Christine (https://experts.colorado.edu/display/fisid_155861)
Assistant Professor; PhD, Northwestern University

Fredrickson, Tammy L. (https://experts.colorado.edu/display/fisid_148888)
Clinical Asst Professor; PhD, University of Colorado Boulder

Hardin, Kathryn Theresa Yarema (https://experts.colorado.edu/display/fisid_139358)
Clinical Asst Professor; MA, University of Colorado Boulder

Hedberg, Natalie L.
Professor Emeritus

Horii, Yoshiyuki
Professor Emeritus

Jancosek, Elizabeth G.
Professor Emeritus

Kan, Pui Fong (https://experts.colorado.edu/display/fisid_145806)
Associate Professor; PhD, University of Minnesota Twin Cities

Kates, James (https://experts.colorado.edu/display/fisid_146722)
Scholar In Residence

Lewon, Jennifer Walentas (https://experts.colorado.edu/display/fisid_147362)
Clinical Asst ProfessorLecturer

Meyers, Christina Nicole (https://experts.colorado.edu/display/fisid_155857)
Assistant Professor; PhD, University of Arizona

Moers, Willard Lee (https://experts.colorado.edu/display/fisid_114371)
Instructor; MA, Gallaudet University

Perez-Pamies, Susanna (https://experts.colorado.edu/display/fisid_147675)
Instructor

Pollard, Ryan D (https://experts.colorado.edu/display/fisid_153106)
Instructor; PhD, University of Colorado Boulder

Ramig, Peter R.
Professor Emeritus

Ramsberger, Gail (https://experts.colorado.edu/display/fisid_100943)
Associate Professor; DSc, Boston University

Rowinski, Chris Morton (https://experts.colorado.edu/display/fisid_113035)
Lecturer

Sadagopan, Neeraja (https://experts.colorado.edu/display/fisid_144517)
Assistant Professor; PhD, Purdue University

Schick, Brenda (https://experts.colorado.edu/display/fisid_110058)
Professor; PhD, Purdue University

Sharma, Anu (https://experts.colorado.edu/display/fisid_143814)
Professor; PhD, Northwestern University

Snyder, Lynn
Professor Emeritus

Sweetman, Richard H.
Professor Emeritus

Thrasher, Amy H. (https://experts.colorado.edu/display/fisid_120907)
Clinical Asst Professor; MA, University of Colorado Boulder

Weiss, Rita S.
Professor Emeritus

SLHS 1010 (3) Disabilities in Contemporary American Society

Addresses the issue that 50 percent of all individuals experience disability in their lifetime. Introduces students to the social, cultural, psychological, economic, political, legal, and health-care issues related to society and individuals with disabilities.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Didactic: All-Department

SLHS 2000 (3) Introduction to Communication Disorders

Surveys communication disorders, including hearing impairments, learning disabilities, and speech-language disorders, as well as an introduction to basic speech and hearing science.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 2010 (3) Science of Human Communication

Discusses how human communication (the process by which a thought is transmitted from the brain of a speaker to the brain of a listener) involves a complex interaction of acoustics, anatomy, physiology, neurobiology, and psychology.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Didactic: All-Department

SLHS 2305 (4) American Sign Language 1

Introduces basic sign vocabulary, grammatical structures of ASL, and the culture of deaf people. Classes are taught using ASL without the use of spoken English.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: American Sign Language

SLHS 2315 (4) American Sign Language 2

Develops more complex vocabulary and grammatical structures, and an understanding of deaf culture. Classes are taught using ASL without the use of spoken English.

Requisites: Requires a prerequisite course of SLHS 2305 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: American Sign Language

SLHS 2325 (4) American Sign Language 3

Continuation of SLHS 2315. Covers ASL literature, advanced grammatical structures, idiomatic expressions, and deaf culture. Meets core requirement for a foreign language.

Requisites: Requires a prerequisite course of SLHS 2315 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: American Sign Language

SLHS 3003 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and LING 3005 and PHIL 3310 and PSYC 3005

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2240 or PSYC 2145.

SLHS 3006 (3) Phonetics

Focuses on production of speech sounds, transcribing speech using the International Phonetic Alphabet, analyzing the acoustic properties of speech sounds, understanding how speech sounds vary depending on the context. Provides a foundation for understanding normal and atypical speech development, atypical speech problems and patterns, regional and foreign accents, and speech recognition by computers.

Requisites: Requires a prerequisite course of LING 2000 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 3014 (3) Hearing Loss Epidemiology

Introduces students to basic epidemiological concepts related to hearing loss. Provides an overview of the hearing mechanism, assessment and identification of hearing loss, prevalence of hearing disorders, treatment and intervention. Noise pollution, aging and toxic agents are discussed. Focuses on risk factors for hearing impairment and comorbidities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 3106 (3) Hearing Science

Focuses on the three main aspects of the hearing process: sounds in the environment (physical acoustics), sounds encoded within the auditory system (physiological acoustics) and perception of sound (psychological acoustics).

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-). Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 3116 (3) Speech Science

Provides a basic understanding of the structural organization (anatomy), function (physiology), and neural controls of the structures used to produce speech, swallowing, respiration, and related behaviors in humans.

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-).

Recommended: Prerequisite SLHS 3106.

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 4000 (3) Multicultural Aspects of Communication Differences and Disorders

Examines perceptions and attitudes regarding differences in communication as a function of cultural-linguistic diversity. Discusses implications of differing verbal and nonverbal communication styles of various cultural groups in terms of professional responsibilities.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite upper-division standing and a minimum of 60 credit hours.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 4100 (1-3) Special Topics in Speech, Language, and Hearing Sciences

Studies selected topics in speech, language, hearing sciences, communication disorders, and other professional issues.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 4502 (3) Language Disorders: Child and Adult

Language disorders can result from problems with cognitive, linguistic, and/or discourse processing. The theoretical framework of language dysfunction is addressed while drawing upon real clinical examples of language disorders that have been observed in children and adults.

Requisites: Requires a prerequisite or corequisite course of SLHS 4560 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 4512 (3) Speech Disorders: Voice, Cleft Palate, Motor Disorders, Stuttering

Provides students with an introductory understanding of specific speech disorders including voice disorders, neurogenic speech disorders, articulation and phonological disorders and craniofacial disorders in children and adults.

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 4560 (3) Language Development

Covers the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

Equivalent - Duplicate Degree Credit Not Granted: LING 4560 and PSYC 4560

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 4576 (3) Communication Neuroscience

Provides an introduction to neuroscience with an emphasis on the systems that support human communication including speech perception and production, language, memory and cognition. Topics areas will include auditory processing, language, memory and motor systems. Development of brain systems and structures will be explored, as well as neurologically based disorders. Neuroscientific methods surveyed will include MRI, fMRI, EEG, MEG, NIRS, lesion studies and electrophysiology.

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

SLHS 4704 (3) Audiological Evaluation

Studies basic principles and techniques of hearing evaluation, including pure-tone, speech, immittance, and advanced audiometry; hearing conservation in hospital, school, and industrial settings; and identification and evaluation of auditory pathologies. Required projects in screening and pure-tone audiometry.

Requisites: Requires a prerequisite course of SLHS 3106 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Audiology

SLHS 4714 (3) Audiological Rehabilitation

Covers basic principles and techniques related to the habilitation and rehabilitation of individuals who are deaf or hard of hearing: amplification, speech, language, auditory, speech reading, and educational issues.

Requisites: Requires prerequisite courses of LING 3100 or SLHS 3006. Requires a prerequisite or corequisite course of SLHS 4704 (all minimum grade C-).

Additional Information: Departmental Category: Didactic: Audiology

SLHS 4849 (1-6) Independent Study for Undergraduates

Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

SLHS 4918 (2) Introduction to Clinical Practice

Introduces students to the clinical processes and key components of assessment and interventions. Explores the applications of the theoretical and scientific information to clinical settings. Students complete supervised observation of individuals with communication challenges.

Requisites: Requires a prerequisite course of SLHS 2000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Speech, Language and Hearing Sciences (SLHS) majors only.

Additional Information: Departmental Category: Practica

SLHS 4938 (1-6) Internship: Speech-Language Intervention

Provides a supervised clinical experience with children who have communication challenges enrolled in the Child Learning Center programs; individuals demonstrating communication disorders as a cotherapist in the Speech, Language, and Hearing Center; or off-campus experience in an affiliated hospital or public school program. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

Speech, Language and Hearing Sciences - Bachelor of Arts (BA)

The undergraduate major in speech, language and hearing sciences (SLHS) at CU Boulder includes course work in three general areas:

- characteristics, causes and treatment of disorders that impact speech, language and/or hearing (e.g., stuttering, head injury, deafness, autism, learning disabilities, etc.),
- the science behind human communication (e.g., the anatomy and physiology of the speech and hearing mechanisms, acoustics of sound, etc.), and
- linguistics, specifically the normal development of language in children, phonetic transcription and the various component parts of language.

The program leads to a Bachelor of Arts (BA) degree. In addition to learning in the classroom about normal and disordered communication, students will observe graduate students and professionals engaged in clinical work with individuals exhibiting speech, language, learning and hearing problems. Internships are optional but are encouraged throughout a student's program.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below. The major includes 35 credit hours of required course work plus a 3-credit course in general psychology.

Required Courses and Credit Hours

Required Courses

LING 2000	Introduction to Linguistics	3
LING 3100	Language Sound Structures	3
PSYC 1001	General Psychology	3
SLHS 2000	Introduction to Communication Disorders	3
SLHS 2010	Science of Human Communication	3
SLHS 3106	Hearing Science	3
SLHS 3116	Speech Science	3
SLHS 4502	Language Disorders: Child and Adult	3
SLHS 4512	Speech Disorders: Voice, Cleft Palate, Motor Disorders, Stuttering	3
SLHS 4560	Language Development	3
SLHS 4704	Audiological Evaluation	3
SLHS 4714	Audiological Rehabilitation	3
SLHS 4918	Introduction to Clinical Practice	2

Electives

The following courses are recommended, but not required:

SLHS 2305 American Sign Language 1

Speech-Language Assistant Certificate Program

If planning to attend graduate school for SLHS, students should take one course from each of the following categories (graduate school prerequisite courses):

Statistics

EDUC 4716/5716 Basic Statistical Methods

SOCY 2061 Introduction to Social Statistics

MATH 2510 Introduction to Statistics

Biological Science

ANTH 2010 Introduction to Biological Anthropology 1

ANTH 2020 Introduction to Biological Anthropology 2

EBIO 1030 Biology: A Human Approach 1

EBIO 1040 Biology: A Human Approach 2

EBIO 1210 General Biology 1

EBIO 1220 General Biology 2

Physics or Chemistry

PHYS 1010 Physics of Everyday Life 1

PHYS 1230 Light and Color for Nonscientists

PHYS 1240 Sound and Music

PHYS 1580 Energy and Interactions

Total Credit Hours 38

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
SLHS 2000	Introduction to Communication Disorders	3
LING 2000	Introduction to Linguistics	3
Core course: content area of study (e.g., historical context)		3
Core course: skills acquisition (e.g., lower-division written communication)		3
Elective/MAPS course		3
		Credit Hours 15
Spring Semester		
PSYC 1001	General Psychology	3
SLHS 2010	Science of Human Communication	3
Core: skills acquisition (e.g., quantitative reasoning & mathematical skills)		3
Core: content area of study (e.g., U.S. context)		3
Elective/MAPS course		3
		Credit Hours 15
Year Two		
Fall Semester		
LING 3100	Language Sound Structures	3
SLHS 4560	Language Development	3

Core: content area of study (e.g., natural science sequence 1)		3
Core: skills acquisition (e.g., natural science lab)		1
Core: content area of study (e.g., human diversity)		3
Elective/MAPS course		3
	Credit Hours	16
Spring Semester		
SLHS 3106	Hearing Science	3
Core: content area of study (e.g., natural science sequence 2)		3
Core: content area of study (e.g., lower-division literature & the arts)		3
Elective/MAPS course		3
Elective/MAPS course		3
	Credit Hours	15
Year Three		
Fall Semester		
SLHS 3116	Speech Science	3
SLHS 4502	Language Disorders: Child and Adult	3
Core: content area of study (e.g., ideals & values)		3
Core: skills acquisition (e.g., contemporary societies)		3
Elective/MAPS course		3
	Credit Hours	15
Spring Semester		
SLHS 4704	Audiological Evaluation	3
SLHS 4918	Introduction to Clinical Practice	2
Core: content area of study (e.g., upper-division written communication)		3
Core: skills acquisition (e.g., natural science nonsequence)		3
Elective: upper-division		3
	Credit Hours	14
Year Four		
Fall Semester		
SLHS 4512	Speech Disorders: Voice, Cleft Palate, Motor Disorders, Stuttering	3
Core: content area of study (e.g., upper-division literature & the arts)		3
Elective/MAPS course		3
Elective: upper-division		3
Elective: upper-division		3
	Credit Hours	15
Spring Semester		
SLHS 4714	Audiological Rehabilitatio	3
Elective/MAPS course		3
Elective/MAPS course		3
Elective: upper-division		3
Elective: upper-division		3
	Credit Hours	15
	Total Credit Hours	120

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in the Department of Speech, Language and Hearing Sciences students should meet the following requirements:

- Declare the major by the beginning of the sophomore year
- Complete prerequisite courses—LING 2000, SLHS 2010 and PSYC 1001—by the end of spring semester of sophomore year.

Theatre & Dance

The Department of Theatre & Dance (<http://www.colorado.edu/theatredance>) offers undergraduate and graduate degrees in both Theatre and Dance, a graduate degree in Experience Design (<http://www.colorado.edu/theatredance/mfa-experience-design>), and a Graduate Certificate in Applied Shakespeare (<http://www.colorado.edu/connect/certificate-programs/applied-shakespeare>). These programs combine traditional studies with practical training. Ambitious seasons of theatre productions and dance concerts feature student performers, designers, directors, choreographers, and guest artists of national and international fame whom often participate in curricular and extracurricular activities.

Recent guests have included Ralph Lemon, Ana Prada, Asia One, Teena Marie Custer, Nina Flagg, Nina Martin, Millicent Johnnie, Ananya Chatterjea, Maria Bauman, Jane Hawley, Tim O'Donnel, Ms. Prissy, April Rose, Chris Aiken and Angie Hauser, Art Bridgman/Myrna Packer, Rennie Harris, Heidi Henderson, Kathleen Hermesdorf, Deborah Jowitt, Darrell Jones, Susan Marshall & Co., Bebe Miller, David Dorfman, Joe Goode, Kevin Wynn, John Scott and Shelley Senter in dance; Lisa Wolpe, Jennifer Hubbard, Geoffry Kent, Eric Van Baars, Silvia Gregory, Gary John LaRosa, Ami Dayan, Terry Berliner, Lee Blessing, Jill Dolan, Elizabeth Dowd, Melanie Marnich, Jim Moody, Tim Miller, Holly Hughes, Jane Page, Joan Schirle, Karen Finley and Mark Medoff in theatre.

Students interested in Theatre and Dance are urged to consult with an advisor in the appropriate field to obtain both advice and the most current information concerning program opportunities and expectations.

Course codes for this department are THTR, DNCE, TDXD and THDN.

Bachelor's Degrees

- Dance - Bachelor of Arts (BA) (p. 521)
- Dance - Bachelor of Fine Arts (BFA) (p. 523)
- Theatre - Bachelor of Arts (BA) (p. 526)
- Theatre - Bachelor of Fine Arts (BFA) (p. 528)
- Theatre - Bachelor/Master of Arts (BAMA) (p. 526)

Minors

- Dance - Minor (p. 525)
- Theatre - Minor (p. 532)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bergner, Bruce Alan (https://experts.colorado.edu/display/fisid_113315)
Associate Professor; MFA, University of Illinois at Chicago

Cobin, Martin T.
Professor Emeritus

Coleman, Bertram E (https://experts.colorado.edu/display/fisid_103065)
Professor; PhD, University of Texas at Austin

Court, Iain Maxwell (https://experts.colorado.edu/display/fisid_156486)
Instructor; MEd, University of Wollongong (Australia)

Cripe, Kerry M (https://experts.colorado.edu/display/fisid_126542)
Senior Instructor; MFA, Florida State University

Devin, Richard
Professor Emeritus

Diachenko, Nada (https://experts.colorado.edu/display/fisid_101362)
Professor; MA, New York University

Ellsworth, Michelle (https://experts.colorado.edu/display/fisid_112060)
Professor; MFA, University of Colorado Boulder

Gerland, Oliver W (https://experts.colorado.edu/display/fisid_101092)
Associate Professor; PhD, Stanford University

Haig, Robin
Professor Emeritus

Hankin, Toby R.
Professor Emeritus

Harris, Lorenzo R. (https://experts.colorado.edu/display/fisid_147634)
Artist in Residence

Henry, Mark Allen (https://experts.colorado.edu/display/fisid_134379)
Associate Professor; MFA, University of Connecticut

Irey, Charlotte York
Professor Emeritus

Lane, Constance Irene (https://experts.colorado.edu/display/fisid_149778)
Instructor; BA, Beloit College

Lessley, Merrill J.
Professor Emeritus

Manno, Jesse J (https://experts.colorado.edu/display/fisid_120813)
Senior Instructor

Mason, Gesel R (https://experts.colorado.edu/display/fisid_149966)
Assistant Professor; MFA, University of Colorado Boulder

Mejia, Donna (https://experts.colorado.edu/display/fisid_151942)
Assistant Professor; MFA, Smith College

Meneghini-Stalker, Tamara L. (https://experts.colorado.edu/display/fisid_146090)
Associate ProfessorAssistant Professor; MFA, Northern Illinois University

Nichols, Lynn Wayne (https://experts.colorado.edu/display/fisid_103654)
Senior Instructor; PhD, University of Colorado Boulder

Osnos, Mary Beth (https://experts.colorado.edu/display/fisid_102607)
Associate Professor; PhD, University of Colorado Boulder

Pang, Cecilia J (https://experts.colorado.edu/display/fisid_129479)
Associate Professor; PhD, University of California-Berkeley

Persons, Charles Howard (https://experts.colorado.edu/display/fisid_145012)
Associate Professor; MFA, Columbia University In the City of New York

Potts, Margaret Lee
Professor Emeritus

Randall, Erika Anne (https://experts.colorado.edu/display/fisid_144755)
Associate Professor; MFA, Ohio State University

Shannon, Robert J.
Professor Emeritus

Sowah, Nii Armah (https://experts.colorado.edu/display/fisid_115125)
Senior Instructor; MA, Lesley College

Spanier, Nancy L.
Professor Emeritus

Stark, Theodore (https://experts.colorado.edu/display/fisid_118462)
Senior Instructor; MFA, Boston University

Symons, James M.
Professor Emeritus

Williams, Letitia S.
Professor Emeritus

Yang, Daniel
Professor Emeritus

DNCE 1000 (2) Beginning Contemporary Dance Technique

Introduces students to the dynamic capabilities of the body as an articulate means of expression. Presents basic concepts and skills from contemporary dance forms that may include Afro-modern, floor work, inversion, classical modern and improvisation. Classwork develops efficient alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness. No experience necessary.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1012 (2) Dance Production

Provides the dancer with an introduction to the types of performance venues available today, and their technical systems and equipment. It will also establish an awareness of how technical theatre design arts may be utilized by a choreographer.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Production

DNCE 1013 (2) Dance Improvisation

An opportunity for students to develop skills of dance improvisation through the exploration of structured movement problems. Students study selected contemporary dance artists whose work stresses improvisation in performance and/or as a training vehicle. Department consent required for dance minors.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 1017 (3) Dance in Popular Culture and Media

Explores and contextualizes contemporary popular culture and dance. Introduces methods of critical analysis that reveal the rich heritage hidden within and around the dances students commonly encounter at the club, on the street, on television, on the big screen and elsewhere in everyday life. Through watching, reading, and discussion, students discover new meaning in their lived cultural experience.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Dance and Cultural Studies

DNCE 1020 (1) Beginning Contemporary Dance with Experience

Invites students to deepen their somatic awareness, efficient athleticism, and creative voice through the medium of contemporary dance. Continues the investigation of contemporary dance forms that may include Afro-modern, floor work, inversions, classical modern, and improvisation. Classwork will deepen students' alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1000 or previous dance experience.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1027 (3) Dance in Cultural Perception and Expression

Explores how the practice of dance can reflect, disrupt, subvert, support, and reinforce cultural expectations, norms and practices. Introduces international and domestic dance traditions and provides context for an interdisciplinary examination. Comparative readings from sociology, anthropology, gender studies, history, post-colonial studies, and political science provide a foundation to understand how cultural identities are negotiated and represented through movement.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts

Departmental Category: Dance and Cultural Studies

Departmental Category: Asia Content

DNCE 1091 (1) Modern 1

Introduces basic skills of modern dance. In-class technique work increases muscle strength, flexibility, and coordination. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 1100 (1) Beginning Ballet

Introduces beginning students to fundamental aspects of classical ballet technique; no previous experience required. Basic principles of alignment, rotation, and movement quality are introduced as the building blocks for success in advanced material. Foundational movements and ballet vocabulary are learned and refined. Students work toward mastery of simple combinations and rhythmic patterns.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1120 (1) Beginning Ballet with Experience

Relies on a demonstrated comprehension of kinesthetic and conceptual principles mastered at the beginning level. New movements from the classical ballet vocabulary are introduced with continued emphasis on alignment, rotation, and movement quality. Ballet sequences are longer and more complex.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1100 or previous ballet experience.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1190 (1) Ballet 1

Beginning ballet covering the basic vocabulary of classical ballet technique. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1200 (1) Beginning Jazz Dance

Introduces various styles of movement unique to jazz dance including improvisation, isolations, and African-influenced polyrhythms. Working within a range of dynamic performance styles, students will learn fundamental dance skills and jazz vocabulary, from which more advanced skills can be developed. Designed for students with little or no dance experience.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1220 (1) Beginning Jazz with Experience

Digs deeper into syncopated movement style of the jazz vernacular by continuing the embodied investigation of the Africanist influence on the form. Demands a rigorous awareness of efficient alignment while engaging with complex movement and challenging rhythmic structures.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1200 or previous dance experience.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1290 (1) Jazz 1

Introduces jazz dance, consisting of a technique warm-up, locomotion across the floor, and a series of dance phrases developed into a short dance combination. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1301 (2) Hip-Hop Dance Technique 1

Introduces students to Hip-Hop dance as a culturally significant form. Students learn history, the social and political forces at work, and the fundamental techniques (Campbell Locking, Popping, Breaking etiquette/movements, Hip-Hop Party Dance and House). Intellectual challenge is offered through the lens of critical race theory and historical context. Training addresses flexibility, sequencing, coordination, and performance skills.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 1401 (1) Transnational Fusion Dance: USA and Middle East/North Africa

Introduces a fusion form popularized in 2000: secular dance traditions of the Middle East/North African (MENA) communities in dialog with popular dances of the hip-hop and underground electronic dance music communities. Stretching, hip work, spinal undulations and poly-rhythmic orientations are covered. Educational highlights include discourse regarding cultural appropriation and gender coding in human movement.

Repeatable: Repeatable for up to 2.00 total credit hours.

DNCE 1849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Freshman level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 1901 (1-3) Technique Practicum

Broadens students' exposure to a range of diverse movement material. Topical course in dance technique, see subtopic for specific form.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technique

DNCE 1908 (1) First Year Dance Seminar

Designed for new dance majors as an introduction to the place of dance within academia and the professional/public spheres. Through the practice of descriptive dance writing, theoretical and physical exploration of discrete pedagogical and choreographic procedures, and interactions with in-class guest artists of different disciplines, students will engage in independent research and physical experimentation, culminating in a final personal presentation and group performance.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Performance

DNCE 2005 (3) Movement Awareness and Injury Prevention for the Dancer

Focuses on safe and effective dance practices supporting longevity and wellness. Areas explored include: experiential anatomy, conditioning, alignment, nutrition, injury prevention, care of common dance injuries, and experience with various somatic practices.

Requisites: Requires a prerequisite course of DNCE 2021 or DNCE 3041 or DNCE 4061 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Somatic Awareness

DNCE 2021 (2) Major Technique

Designed for Dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 2091 (1) Modern 2

Continuation of Modern 1. a developmental sequence of modern dance technique designed to refine the technical/expressive skills required of the professional dancer. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 2098 (1) Performance/Repertory

Students learn and perform dances from the repertory of guest artists. Offered summers only.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Performance

DNCE 2101 (1) Pointe

Introduces the basic training for the art of dancing in pointe shoes. Includes enchainements in pointe shoes and additional conditioning exercises for the feet and legs. Students should be at an Intermediate/Advanced ballet level with a strong understanding of rotation and alignment. No previous pointe experience necessary. Audition required.

Repeatable: Repeatable for up to 4.00 total credit hours.

Recommended: Prerequisite DNCE 3161 or DNCE 4181.

Additional Information: Departmental Category: Major Technique

DNCE 2141 (1) Low Intermediate Ballet

Builds on an existing understanding of alignment, rotation, and movement quality to introduce more mentally and physically difficult movements and enchainements of the classical ballet vocabulary. Students must be able to demonstrate an embodied familiarity with all traditional barre exercises on the first day of class.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1120 or previous ballet experience.

Additional Information: Departmental Category: Technique

DNCE 2191 (1) Ballet 2

Intermediate ballet, covering the complete vocabulary of classical ballet technique. Enchainements are of complex structure. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 2290 (1) Jazz 2

Continuation of Jazz 1. Studies coordination, rhythm, style, and advanced body part isolation in depth. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 2501 (2) African Dance

Explores the technique, styles, and rhythms of regional and national cultures of Africa. Areas of concentration may vary each semester (e.g. Ghana, Mali, Guinea, etc.). Introduces signature attributes common to different countries' dance traditions and features discussions of the musical traditions, histories, cosmologies, philosophies and aesthetics to contextualize and increase familiarity.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technique

DNCE 2701 (2) Contact Improvisation 1

Investigates movement vocabulary and kinesthetic understanding through physical contact and weight-sharing between two or more dancers. Fundamental skills of contact will be introduced and employed in duets and larger group improvisations: rolling, falling, giving and receiving weight, and the use of momentum and gravity.

Additional Information: Departmental Category: Major Technique

DNCE 2849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Sophomore level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 2901 (1-3) Technique Practicum 2

Topical course (second level) in dance technique, see subtopic for specific form. May require an audition.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Major Technique

DNCE 2909 (1-4) Special Topics

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4909 and DNCE 5909

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 3001 (2) Intermediate/Advanced Contemporary Dance Technique

Challenges intermediate and advanced students to refine their understanding and personal approach to the study of international contemporary dance. Demands a deep sense of somatic awareness, efficient athleticism, and creative voice. Floor work, inversions, and improvisation may be included. No audition required.

Repeatable: Repeatable for up to 4.00 total credit hours.

Recommended: Prerequisite DNCE 1000 or DNCE 1020 or any major technique course ending in "1" or previous dance experience.

Additional Information: Departmental Category: Technique

DNCE 3014 (2) Rhythmic Skills for Dancers

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class.

Department consent required for dance minors.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Music

DNCE 3024 (2) Musical Resources for Dance

Examines how musical choices can profoundly affect audiences, dancers, and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues. Department consent required for dance minors

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Music

DNCE 3033 (3) Choreographic Resources

Explores movement invention and strategies of choreographic manipulation of body, space and time. Students add to their toolbox of compositional resources through solo and duet studies. Class interrogates and supports the students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3043. Formerly DNCE 2033.

Requisites: Requires a prerequisite course of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 3035 (1) Production Practicum

Practical production activities and projects within a designated area of dance design, stage technology, or stage management, normally related to the department's season. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Production

DNCE 3041 (2) Major Technique

Designed for dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 3043 (3) Choreographic Process

Examines physical and spatial relationships via group and site specific work. New methods of creative problem solving unearth and mine one's imagination and inspiration, cultivating the individual's unique process of dance-making. Class interrogates and supports students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3033.

Requisites: Requires prerequisite courses of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (all minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 3101 (1-3) Ballet Practicum

Practical studio training in ballet at the advanced/professional level with a professional company. Designed for dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of DNCE 2141 or DNCE 3161 or DNCE 4181 (minimum grade C-).

Additional Information: Departmental Category: Major Technique

DNCE 3161 (1) Intermediate Ballet

Surveys a wide range of the intermediate-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Students must work efficiently to execute the technique with rhythmic accuracy, clarity of line, propriety of style, and fluency in translating names of steps. Enrollment by audition only.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 3241 (1) Intermediate Jazz

Expands student's performance of the syncopated movement style of the jazz vernacular. Designed for the experienced jazz dancer. Includes dance techniques that further improves alignment, strength, flexibility, and coordination within the jazz idiom through an emphasis on style, rhythm, and more challenging dance combinations.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1220 or previous dance experience.

Additional Information: Departmental Category: Technique

DNCE 3301 (2) Hip-Hop Dance Technique 2

Builds on fundamentals established in Hip-Hop Dance Technique 1. Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. The course focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 3601 (2) Alexander Technique for Actors and Dancers

Studies how human reaction, coordination, and movement play a role in all activities. Through in-depth class discussions, movement, exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 5601.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) or Theatre (THTR or TBFA, excludes THTR-MIN) majors only.

Additional Information: Departmental Category: Technique

DNCE 3801 (2) Major Technique: Multiple Accompanists

Designed for dance majors. Encompasses range of dance forms that require multiple accompanists. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 3849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Junior level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 3901 (1-3) Technique Practicum

Topical course (intermediate level) in dance technique. See subtopic for specific form. May require an audition.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technique

DNCE 4012 (1) Concert Production

Provides practical experience in producing formal and informal dance concerts. Introduces basic familiarity with production and promotional responsibilities, backstage and front-of-house duties and procedures. Meets with DNCE 5012.

Requisites: Requires a prerequisite course of DNCE 1012 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Major Technique

DNCE 4015 (3) Movement Analysis

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 5015.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Movement Awareness Injury Prevent for the Dancer

DNCE 4016 (3) Creative Dance for Children

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5016

Requisites: Requires a prerequisite course of DNCE 2033 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Pedagogy

DNCE 4017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5017

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite or corequisite a Human Diversity core requirement course.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Dance and Cultural Studies

DNCE 4023 (2) Performance Improvisation Techniques

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5023

Additional Information: Departmental Category: Creative Process

DNCE 4036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5036

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Pedagogy

DNCE 4037 (3) Contemporary Concert Dance: Shifting Perspectives in Performance

Focuses on the development of perceptual, descriptive, and analytical skills as well as the ability to apply cultural and critical theory to 20th and 21st century concert dance. Specific pieces of choreography are looked at from a broad range of perspectives.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite or corequisite a Human Diversity core requirement course.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Dance and Cultural Studies

DNCE 4038 (1-3) Dance Repertory

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5038

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Performance

DNCE 4046 (1) Teaching Practicum

Designed to give students supervised practical teaching skills through practice teaching, discussion, observation (in-person and video), reflection and feedback. Students will develop age appropriate lesson plans, define and refine principles of classroom management and understand the needs of diverse groups of students in a community, academic (K-12) and/or studio setting. All genres of dance are topic relevant.

Requisites: Requires a prerequisite course of DNCE 4036 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Pedagogy

DNCE 4047 (3) Hip-Hop Dance History

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 5047.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 4053 (3) Advanced Dance Composition

Focuses on deepening the artistic voice and engaging with other art forms. Students explore the integration of technology and collaboration in creative projects and continue to engage in an objective critical process of their own work and the work of others. Meets with DNCE 5053.

Requisites: Requires a prerequisite course of DNCE 3043 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 4061 (2) Major Technique

Designed for dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Major Technique

DNCE 4128 (1) Ballet Repertory

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and New-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 5128.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Performance

DNCE 4181 (1) Advanced Ballet

Investigates the full range of the advanced-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Exercises require strength and a deeply subtle understanding of principles of alignment, rotation, epaulement, and movement quality. Class moves quickly through enchainements of complex structure. Enrollment by audition only.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 4261 (1) Advanced Jazz Dance Technique

Refines advanced students' approach to the nuances and virtuosity of jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 5261.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 4701 (2) Contact Improvisation 2

Builds upon skills introduced in DNCE 2701 and moves into more rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 5701.

Requisites: Requires a prerequisite course of DNCE 2701 (minimum grade C-).

Additional Information: Departmental Category: Major Technique

DNCE 4849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Senior level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 4909 (1-4) Special Topics

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 2909 and DNCE 5909

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 4919 (1-3) Dance Practicum

Project in dance under supervision of senior faculty.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5919

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

DNCE 4939 (1-3) Dance Internship

Provides an opportunity for upper-division dance majors to serve apprenticeships in the community in work areas related to their major interests and career goals. Internships are available in areas such as arts administration, dance therapy, and technical production. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Independent Study

THTR 1003 (3) Acting 1: Introduction to Acting

Introductory course designed to explore creativity, collaboration and communication in the craft of acting. Focuses on basic terms and concepts of psychological realism fundamental to the actors' process through solo work and ensemble exercises. Open to majors and non-majors.

Additional Information: Departmental Category: Performance

THTR 1009 (3) Theatre and Society

Explores the importance of telling (and listening) to stories from the stages of the world; in theatre we learn what people value in their time and place. Investigates the range of genres of theatre in today's society and how theatrical artwork is devised and presented. Ideal for non-majors.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression Arts Sci Core Curr: Literature and the Arts

Departmental Category: Special Courses in Theatre

THTR 1011 (3) Global Theatre 1: Live Performance to Shakespeare

Travels across four continents exploring live performance from the beginning of recorded history to Shakespeare through various forms of theatrical storytelling including masked dramas, shadow puppets, kabuki, passion plays and commedia.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression Arts Sci Core Curr: Literature and the Arts

Departmental Category: History/Dramaturgy/Directing

THTR 1019 (3) Script Laboratory: Text Analysis and Practice for the Theatre

Introduces fundamental methods of text analysis for performance. Equips theatre makers with common vocabulary and concepts to more effectively communicate when collaborating with other artists. Provides tools for analyzing any narrative art form.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) Theatre (THTR or TBFA) majors only (excluding minors).

Additional Information: Departmental Category: Special Courses in Theatre

THTR 1105 (3) Stage Technologies

Introduces technical production elements and procedures, including materials, organizations, methods and equipment to realize theatrical scenery, properties, lighting and sound.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 1115 (3) Costume Technologies

Introduces technical production elements and procedures including materials, organizations, methods and equipment to realize theatrical costuming and make-up.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 2003 (3) Acting 1

Emphasizes principles of acting, focusing on exercises in relaxation, talking and listening, actions and objectives, and basic concepts of process work.

Requisites: Restricted to Theatre (THTR or TBFA) majors only (excluding minors).

Additional Information: Departmental Category: Performance

THTR 2021 (3) Global Theatre 2: Forms of Modern Theatre and Drama

Explores the dramatic literature, performance traditions and cultural contexts in world theatre from 1600s to the present, through discussion, writing and theatre practice, with an emphasis on the impacts of modernity and colonialism.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 2035 (3) Design Fundamentals

Introduces principles and techniques relevant to the expression of dramatic mood and idea through visual elements of the theatre, giving practice in concept development, style selection, and rendering techniques in scenery and costume design.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 2043 (3) Voice and Movement for the Stage

Natural resources of the human voice and body are studied as artistic resources for the performing artist. Designed to examine both the process and products of vocal and physical craft work.

Requisites: Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

Additional Information: Departmental Category: Performance

THTR 2059 (3) Open Topics in Theatre and Drama

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online schedule planner.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 2105 (3) Introduction to Performance Design

Introduces the creative/collaborative process of design for theatre and dance, including scenery, costume, lighting, and sound. Students create design projects and evaluate them with regard to artistic and practical concerns. Much of the course work is hands-on, experiential, and team-oriented.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 2849 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 3005 (3) Costume Design 1

Study and application of the principles of design as applied to stage costume, emphasizing texts in analysis and interpretation. Presented in a studio format and project driven. Explores concept development, style selection, and extensive practice in a variety of media and techniques for costume rendering.

Requisites: Requires prerequisite course of THTR 1115 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3011 (3) American Musical Theatre History

Studies the creation, evolution and influence of American musical theatre and its importance to American society. Students analyze landmark productions, artists and the creative process.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 3 credits in THTR, DNCE or MUSC.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: History/Dramaturgy/Directing

THTR 3013 (3) Studio 1: Building a Character

Students learn to deepen and develop their proficiency with specific acting techniques. Explores the craft elements of acting, as well as text analysis.

Requisites: Restricted to Theatre (TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 3015 (3) Scene Design 1

Examines the process of theatrical scene design from early conception to realization. Course work is project-based. Students are introduced to the crafts of script analysis, conceptualization, design expression, drafting, and 3-D model building.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3023 (3) Studio 2: Creating a Role

Continued development of acting technique and tools for play analysis, with particular emphasis on scene study. Special attention will be given to the Master Teachers of Acting and their pedagogies.

Requisites: Requires prerequisite course of THTR 3013 (minimum grade C-). Restricted to Theatre (TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 3031 (3) Development of Theatre 3: 20th Century International Drama

Introduces 20th century international drama. Discusses selected plays by major African, Asian, and European authors and explores different dramatic traditions and their increasing interactions throughout the 20th century.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 3033 (1-3) Production Research and Practicum: Acting

Allows students to undertake an acting project, either within the major season or approved departmental production. Requires detailed preparational research, rehearsal commitments, and public presentation of theories and concepts in practice. Following the performance, students present written reports and evaluations.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Performance

THTR 3035 (1-2) Production Practicum

Practical production projects within a designated area of technical theatre, design, stage management, normally related to the department's season.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3037 (2-3) Shakespeare Practicum

Students are assigned to work with production artisans of the Colorado Shakespeare Festival. While there are many possible areas, production designs for each season determine the number of available positions.

May substitute for two credits of THTR 3035.

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Shakespearean Production

THTR 3043 (3) Advanced Voice for the Stage

Continues the work begun in THTR 2043. Studies advanced vocal techniques with the goal of integrating these skills into the working process of the performing artist.

Requisites: Requires prerequisite course of THTR 2043 (minimum grade C-). Restricted to Theatre (THTR or TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 3045 (3) Stage Management

Covers stage management from the inception of a production concept through the process of mounting a production, focusing on the interrelationships of the various artists involved, management and scheduling of time, and the psychology of handling a wide range of personalities.

Requisites: Requires prerequisite course of THTR 1105 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3053 (3) Acting 2

Continuation of the techniques introduced in the beginning acting course (THTR 1003). Emphasis is placed on monologues and scene study of contemporary plays. Basic techniques in developing a character are explored.

Requisites: Requires prerequisite course of THTR 1003 (minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 3055 (3) Stage Lighting Design 1

Introduces the craft of stage lighting design through experimental lighting labs, lecture/demos, hands-on production experience, and theoretical projects. Subject matter includes aesthetics of light, color theory, lighting for performance, design graphics, and basic lighting technology.

Requisites: Requires prerequisite course of THTR 1105 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3075 (3) Sound Design

Study and application of the principles of sound technology and design, emphasizing concepts of electricity, acoustics, equipment, and their application to the stage.

Requisites: Requires prerequisite course of THTR 1105 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3085 (3) Fashion, Society and Decor

Surveys topics in western dress and the decorative arts from civilizations of antiquity to contemporary time: the garments, objects, materials and technologies in the context of philosophical, political, social and technological change.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3149 (2) Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors

Explores and identifies a wide range of professional opportunities connected to personal strengths and interests in theatre and dance by studying current professional practices, trends and cross-disciplinary connections. Instructor will: provide information/learning needed from representative professionals; open avenues to find/create employment opportunities towards internship consideration/post-graduation; and mentor structured self-assessment/professional development.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) or Dance (DNCE or DBFA) majors (excluding minors).

Additional Information: Departmental Category: Special Courses in Theatre

THTR 3849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4005 (3) Costume Design 2

Advanced studio course building on experiences and techniques studied in THTR 3005, with additional emphases on portfolio quality rendering technique and costume production technology as it affects and is affected by the designer.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of THTR 3005 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4013 (3) Studio 3: Acting Shakespeare

In-depth study of Shakespearean texts from the perspective of their demands on the actor, including the conventions and performance styles of Elizabethan theatre.

Requisites: Requires prerequisite courses of THTR 3013 and THTR 3023 (all minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4015 (3) Scene Design 2

Advanced projects in theatrical scene design. Provides intensive practice in sketching, rendering, drafting and model-building. Emphasizes portfolio development and preparing the student designer for graduate training or professional work.

Requisites: Requires prerequisite course of THTR 3015 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4021 (3) American Theatre and Drama

Explores American theatre and drama in the 18th centuries to the present. Examines productions, their creators and performers. Contains lecture, discussion, writing and theatre practice.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

Recommended: Requisite at least 12 hours of THTR course work.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4023 (3) Studio 4: Playing with Styles

Studies selected styles of theatre performance such as Greek Drama, Comedy of Manners, Commedia Dell'art, Modern Realism, Theatre of Absurd, and Non-Western Theatre, including vocal and physical style elements.

Requisites: Requires prerequisite courses of THTR 3013, THTR 3023 and THTR 4013 (all minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4029 (1-12) Performance and Community Engagement

Engages students in harnessing the power of performance for effecting positive social change. Students work collaboratively to create performances and workshop experiences. Readings will provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations to intentionally author the future they want. Open to all forms of performance: music, film, dance, theatre.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4033 (3) Advanced Movement for the Stage

Continues the work begun in THTR 2043. Studies the advanced physical techniques with the goal of integrating these skills into the working processes of the performing artist.

Requisites: Requires prerequisite course of THTR 2043 (minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4035 (3) Scene Painting

Introduces the craft of scene painting through practical projects. Sessions are in a studio format. Students are trained in traditional methods of scenic art, including layout, representational painting, trompe l'oeil, faux finishing, and related skills. Students are taught about proper tool use and care, paint products, and the profession.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4039 (3) Musical Theatre Repertory

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5039

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) or Music (MUSA-BAMUS, MUSC-BMUS or MUSE-BMUE) majors only (excluding minors).

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4041 (3) Women and Theatre of the 20th and 21st Centuries

Explores a body of 20th and 21st century dramatic literature central to the study of women and theatre as well as the study of 20th and 21st century cultural history from a cross-national and multiracial feminist perspective. Major playwrights, particularly women from Asia, Africa, and Europe, are read and discussed.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5041 and WGST 4041

Recommended: Prerequisite THTR 3031.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4047 (3) Shakespeare Behind the Scenes

Detailed study of script analysis, directing concepts, staging and criticism of the plays being produced by the Colorado Shakespeare Festival.

Additional Information: Departmental Category: Shakespearean Production

THTR 4049 (1-4) Special Topics in Theatre

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5049

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4051 (3) Playwriting

Introductory course in craft of playwriting; primary focus on technique of developing short plays.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4055 (3) Stage Lighting Design 2

Assumes a basic knowledge of stage lighting; concentrates on advanced technology, processes, and design projects.

Requisites: Requires prerequisite course of THTR 3055 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4059 (3) Open Topics in Theatre and Drama

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4061 (3) Directing

Theory and practice of directing for the stage.

Requisites: Requires prerequisite courses of THTR 1003 or THTR 2003 and THTR 1105 and THTR 1115 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

Recommended: Prerequisites two semesters of THTR 3035.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4063 (3) Audition Techniques

Prepares students for the demands of the acting profession. Trains students in various audition techniques including general auditions, prepared auditions, cold readings, on-camera auditions, and commercial auditions. Shows how to prepare and perfect audition material in a professional and exemplary way. Discusses agents, casting directors, and the process of becoming a professional actor.

Requisites: Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 4073 (3) Performing Voices of Women

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4073

Additional Information: Departmental Category: Performance

THTR 4081 (3) Senior Seminar

Intellectual and conceptual capstone course for departmental majors with separate sections for theatre and dance students. Course promotes integration of ideas regarding history, criticism, and theory in performance and production. All inquiry throughout the semester relates to the theme of creative process.

Requisites: Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4085 (3) Theatre Management

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5085

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4095 (1-3) Special Topics in Theatre Design and Technology

Intensive study of specialized topics in theatre technology and design. Topics and credits specified in the online Schedule Planner.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4103 (3) Acting for the Camera

Introduces fundamental tools of acting for the camera. Students learn basic film terminology, specific camera acting techniques, and the demands placed on an actor when shooting a film. Uses exercises, scenes, monologues, and readings to provide a solid understanding of how to create a character, analyze a text, utilize important vocabulary, and perform effectively on camera.

Requisites: Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 4105 (3) Theatre Make-Up Design

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5105

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4113 (3) Comedy: A Performance Study

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5113

Additional Information: Departmental Category: Performance

THTR 4125 (3) Watercolor Illustration and Rendering Techniques

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5125

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4145 (3) Colloquium in Advanced Design

An advanced theatre design course that emphasizes the collaborative process and advanced design presentation methods. Course work includes completion of several "mock" design projects, with students often working in collaborative teams.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4149 (1-3) Theatre Internship

Provides opportunities for theatre majors to explore career opportunities in theatre fields other than, or in addition to, those with performance emphasis. Students apply knowledge and skills developed in their major studies to a practical work experience.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Requisite 30 credit hours in THTR.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4173 (3) Creative Climate Communication

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3173 and ATLS 3173

Recommended: Prerequisite ENVS 1000.

Additional Information: Departmental Category: Performance

THTR 4175 (3) Conceptualization

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5175

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4193 (1-3) Studio 5: Senior Project

Students engage in a project or projects of their own undertaking that takes a broader experience to apply the craft utilizing self-initiative, collaborative approaches and public exhibition. Instructor consent required for non-BFA THTR performance majors.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of THTR 3013 and THTR 3023 and THTR 4013 and THTR 4023 (all minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4555 (1-2) Production Studio

Requires participation in a Theatre Department production assignment in the areas of design, technology, or management, as well as participation in a semester portfolio review. May be repeated upto 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Theatre (TBFA) majors only.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

Dance - Bachelor of Arts (BA)

CU Boulder has an exciting and diversified dance program. We are a contemporary program - one that values and provides study in a range of styles and fusion of forms that influence and reflect the multifaceted nature of dance performance today. Our curriculum is designed to develop concrete skills in performance and choreography and to instill an appreciation of the role that dance plays in human culture around the world. The following areas of knowledge and experience are central to all the undergraduate degrees in dance:

- physical accomplishment in a range of dance styles and within fusions of various forms, including Contemporary, Ballet, Jazz,

Hip-Hop, Transnational Fusion, African Dance, Performance Improvisation, and other dance traditions from around the world;

- experience with the process and underlying aesthetics of dance creation, composition, and collaboration;
- basic familiarity with cultural, sociological, and aesthetic issues important to the contemporary realities of the field of dance, including a working knowledge of major world dance styles, works of dance literature, theoretical lenses, and the history of dance;
- knowledge of the various means, such as stagecraft, costuming, lighting, make-up, production, and projections, through which a public presentation of dance is realized;
- study and practical experience in dance pedagogy, identifying our purpose, goals and objectives as future educators;
- basic knowledge of tactics for sustaining wellness, including various somatic approaches to dance training, injury prevention and rehabilitation from injury;
- experiential study of the relationship between dance and music, including concrete practice of skills in playing and hearing music;
- and, opportunities to explore the power of performance for effecting positive social change.

In addition, students completing a degree in dance are expected to acquire the ability and skills to:

- actively participate in dance as an art form with particular attention to at least one of the following areas of dance: performance, choreography, dance production, scholarship, pedagogy or criticism;
- understand and mobilize knowledge of appropriate use of the anatomy and physiology of the body in performance and teaching;
- communicate effectively to an audience through at least one of the components of dance—performance, choreography, teaching or scholarship;
- and, function constructively as a member of a dance community in the preparation of regularly scheduled public productions.

BA and BFA students are expected to take a variety of technique styles. A minimum of three different styles, as well as African dance, are required. Dance majors must earn a C- or better in all required courses. Students who have not placed in the major technique class (DNCE 2021, DNCE 3041 or DNCE 4061) by their second semester in dance program are strongly advised not to continue in the major program in dance. Placement into and successful completion of major technique is a prerequisite for enrollment in other required dance courses.

Requirements

The Bachelor of Arts provides a well-rounded dance education in both technique and theory courses. Students must receive a C- or better in all required courses.

Required Courses and Credit Hours

Required lower division courses:

DNCE 1012	Dance Production	2
DNCE 1013	Dance Improvisation	2

DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 2501	African Dance	2

Required major technique courses:

*Fulfill 6 credit hours from the following:*¹ 6

DNCE 2021	Major Technique	
DNCE 3041	Major Technique	
DNCE 4061	Major Technique	

Choose one of the following upper division music courses:

DNCE 3014	Rhythmic Skills for Dancers	2
or DNCE 3024	Musical Resources for Dance	

Choose one of the following upper division creative process courses:

DNCE 3033	Choreographic Resources	3
or DNCE 3043	Choreographic Process	

Required production practicum courses:

Take 2 credit hours of production practica: (1 credit of Run Crew required) 2

DNCE 3035	Production Practicum	
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Required upper division courses:

DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
DNCE 4046	Teaching Practicum	1
DNCE 4939	Dance Internship	1
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4029	Performance and Community Engagement	3
THTR 4081	Senior Seminar	3

Electives in dance technique:

DNCE courses ending in "1" 6

Required theatre production course:

Select one of the following in THTR Production 3

THTR 1105	Stage Technologies	
THTR 1115	Costume Technologies	
THTR 2105	Introduction to Performance Design	
THTR 3005	Costume Design 1	
THTR 3015	Scene Design 1	
THTR 3045	Stage Management	
THTR 3055	Stage Lighting Design 1	
THTR 3075	Sound Design	
THTR 4035	Scene Painting	
THTR 4055	Stage Lighting Design 2	
THTR 4095	Special Topics in Theatre Design and Technology (Some sections including: Tailoring, Conceptualization or Product Design)	
THTR 4105	Theatre Make-Up Design	
THTR 5025	Costume Patterning and Construction	

Total Credit Hours

51

¹ Students are placed at the appropriate level based on audition. Students without sufficient training will be asked to take nonmajor technique classes to make up the deficiency. These classes will not count toward the major requirement.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in dance, students should meet the following requirements:

Course	Title	Credit Hours
Year One		
Fall Semester		
DNCE 1012	Dance Production	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2021	Major Technique	2
	Credit Hours	8
Spring Semester		
DNCE 1013	Dance Improvisatio	2
DNCE 3035	Production Practicum	1
DNCE 3041	Major Technique	2
	Credit Hours	5
Year Two		
Fall Semester		
DNCE 2501	African Dance	2
THTR 1115	Costume Technologies	3
THTR 4029	Performance and Community Engagement	3
	Credit Hours	8
Spring Semester		
DNCE 2005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 3035	Production Practicum	1
Additional Technique		2
	Credit Hours	6

Year Three

Fall Semester

DNCE 3014 or DNCE 3024	Rhythmic Skills for Dancers or Musical Resources for Dance	2
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DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
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THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
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Additional Technique		1
	Credit Hours	8

Spring Semester

DNCE 3033 or DNCE 3043	Choreographic Resources or Choreographic Process	3
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DNCE 4046	Teaching Practicum	1
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DNCE 4061	Major Technique	2
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	Credit Hours	6
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Year Four

Fall Semester

DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
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DNCE 4939	Dance Internship	1
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Additional Technique		2
	Credit Hours	6

Spring Semester

THTR 4081	Senior Seminar	3
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Additional Technique		1
	Credit Hours	4

	Total Credit Hours	51
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Dance - Bachelor of Fine Arts (BFA)

Our BFA program is designed to meet the needs of highly talented and motivated students interested in preparing for a professional dance career in performance and/or choreography while in an academic setting.

The characteristics that the faculty looks for in BFA students are:

- exceptional technical/expressive ability as demonstrated in class work and performance;
- choreographic skill or potential as demonstrated through movement invention and appropriate clarity of structure;
- willingness and drive necessary to pursue a professional career in dance;
- exceptional musicality and rhythmic precision; and,
- maturity, organization and positive attitude.

In addition to specified coursework, the BFA student must meet the following requirements:

- show original choreographic work each semester in Open Space, FRESH, or Dance Class Showings;
- present a concert in conjunction with other senior BFA's in the spring of their senior year;
- By December of their junior year the student must have formed a committee of two faculty members who will evaluate his/her concert. The student and First Reader (lead faculty member) of the committee will complete a BFA Concert Form that is given to the Director of Dance Production by January 31 junior year. The Director of Dance Production will help you plan and oversee the production aspects of the show; and,
- maintain a 3.2 in required dance and theatre courses. If you drop below the required GPA by the time of your concert proposal submission (January 31) you will be removed from the BFA and your concert proposal will no longer be considered.

Applying for the BFA

Students who did not pre-audition into the BFA program and who wish to pursue the BFA can audition during the fall semester of their freshman or sophomore year. If you a sophomore auditioning for the BFA, you must be enrolled in or have taken DNCE 3033 or DNCE 3043 in order to be on track to graduate in 4 years. Application guidelines for the BFA track will be posted each fall semester. The undergraduate director will notify students of faculty decisions regarding their audition. If a student is admitted to the program he/she should talk to Kyle Neidt, Primary Advisor, to have their degree status officially changed from BA to BFA.

Requirements

Required Courses and Credit Hours

Required Courses

DNCE 1012	Dance Production	2
DNCE 1013	Dance Improvisation	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2501	African Dance	2
DNCE 2005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 3014	Rhythmic Skills for Dancers	2
DNCE 3024	Musical Resources for Dance	2
DNCE 3033	Choreographic Resources	3

DNCE 3035	Production Practicum	1
DNCE 3043	Choreographic Process	3
DNCE 3601	Alexander Technique for Actors and Dancers	2
DNCE 4012	Concert Production	1
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
DNCE 4046	Teaching Practicum	1
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance	3
DNCE 4053	Advanced Dance Composition	3
DNCE 5052	Studio Concert	3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4029	Performance and Community Engagement	3
THTR 4081	Senior Seminar	3
Electives		
Take 12 credit hours of one of the following: ¹		12
DNCE 2021	Major Technique	
DNCE 3041	Major Technique	
DNCE 4061	Major Technique	
Select one of the following:		2-3
THTR 1003	Acting 1: Introduction to Acting	
DNCE 4023	Performance Improvisation Techniques	
THTR 4073	Performing Voices of Women	
Electives in dance technique courses ending in "1"		9
Select one of the following in THTR Production:		3
THTR 1105	Stage Technologies	
THTR 1115	Costume Technologies	
THTR 2105	Introduction to Performance Design	
THTR 3005	Costume Design 1	
THTR 3015	Scene Design 1	
THTR 3045	Stage Management	
THTR 3055	Stage Lighting Design 1	
THTR 3075	Sound Design	
THTR 4035	Scene Painting	
THTR 4055	Stage Lighting Design 2	
THTR 4105	Theatre Make-Up Design	
THTR 5025	Costume Patterning and Construction	
Some sections of the following including Tailoring, Conceptualization or Projection Design:		
THTR 4095	Special Topics in Theatre Design and Technology	
Total Credit Hours		77-78

¹ Students are placed at the appropriate level based on audition. Students without sufficient training will be asked to take nonmajor technique classes to make up the deficiency. These classes will not count toward the major requirement.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a

requirement for the major. To maintain adequate progress toward a BFA in dance, students should meet the following requirements:

Course	Title	Credit Hours
Year One		
Fall Semester		
DNCE 1012	Dance Production	2
DNCE 1027	Dance in Cultural Perception and Expression	3
DNCE 1908	First Year Dance Seminar	1
DNCE 2021	Major Technique	2
		Credit Hours
		8
Spring Semester		
DNCE 1013	Dance Improvisation	2
DNCE 3041	Major Technique	2
DNCE 3035	Production Practicum	1
Additional technique as needed		2
		Credit Hours
		7
Year Two		
Fall Semester		
DNCE 2501	African Dance	2
DNCE 3014	Rhythmic Skills for Dancers	2
THTR 1115	Costume Technologies	3
THTR 4029	Performance and Community Engagement	3
		Credit Hours
		10
Spring Semester		
DNCE 2005	Movement Awareness and Injury Prevention for the Dancer	3
DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 3033	Choreography Resources	3
DNCE 3024	Musical Resources for Dance	2
Additional technique as needed		2
		Credit Hours
		12

Year Three

Fall Semester

DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 3601	Alexander Technique for Actors and Dancers	2
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction	3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
		Credit 9
		Hours 11-12

Spring Semester

DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 3043	Choreograph Process	3
DNCE 4046	Teaching Practicum	1
THTR 1003 or DNCE 4023 or THTR 4073	Acting 1: Introduction to Acting or Performe Improvis Technique or Performi Voices of Women	2-3
Additional technique as needed		3
		Credit 11-12
		Hours 11-12

Year Four

Fall Semester

DNCE 3041 or DNCE 4061	Major Technique or Major Technique	2
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 4053	Advanced Dance Composition	3

DNCE 4012	Concert Production	1
		Credit 9
		Hours
Spring Semester		
DNCE 4037	Contempora Concert Dance: Shifting Perspectives in Performance	3
DNCE 5052	Studio Concert	3
THTR 4081	Senior Seminar	3
Additional technique as needed		2
		Credit 11
		Hours
		Total Credit 77-78
		Hours

Dance - Minor

The minor in dance is designed to provide the student with a broad overview of dance as an art form. Required core courses introduce students to basic elements of dance while the remaining plan is created by the student in conjunction with Primary Advisor, Kyle Neidt. If you have specific dance questions, please contact the Director of Dance.

The rules of the College of Arts and Sciences apply in designing each student's program.

Requirements

Requirements include a minimum of 20 credit hours; 9 of which must be upper division; a minimum grade of C- in each dance class; and a minimum of a 2.00 GPA for all dance and approved non-dance courses. Transfer students may apply a maximum of 9 transfer hours with a maximum of 6 upper-division credit hours to the dance minor. Students select courses from the dance curriculum based on their interests and course availability.

Required Courses and Semester Credit Hours

Required Courses

<i>Select two of the following:</i>		6
DNCE 1017	Dance in Popular Culture and Media	
DNCE 1027	Dance in Cultural Perception and Expression	
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance	
DNCE 4047	Hip-Hop Dance History	
<i>Plus 4 additional credit hours of dance technique (courses ending in 0 or 1), which could include the following:</i>		4
DNCE 1013	Dance Improvisation	
<i>Elective Courses ¹</i>		10
DNCE 1012	Dance Production	
DNCE 1908	First Year Dance Seminar	
DNCE 2005	Movement Awareness and Injury Prevention for the Dancer	
DNCE 3014	Rhythmic Skills for Dancers	

DNCE 3024	Musical Resources for Dance
DNCE 3033	Choreographic Resources
DNCE 3035	Production Practicum
DNCE 3043	Choreographic Process
DNCE 4023	Performance Improvisation Techniques
DNCE 4036	Dance Teaching Practices: Inclusive Approaches to Instruction
DNCE 4909	Special Topics
DNCE 4919	Dance Practicum
DNCE 4939	Dance Internship
DNCE Independent Studies	
DNCE Technique courses ending in 0 or 1	
THTR 1003	Acting 1: Introduction to Acting
THTR 3055	Stage Lighting Design 1
THTR 3075	Sound Design
THTR 4039	Musical Theatre Repertory
ARSC 4040	Arts and Sciences Special Topics
THTR 4073	Performing Voices of Women
THTR 4555	Production Studio
RLST 3838	Dancing, Religion, and Culture

Total Credit Hours 20

¹ Some upper division courses may require prerequisites. 800-900 sections are controlled enrollment and require an audition or instructor consent.

Theatre - Bachelor of Arts (BA)

The BA program in Theatre is a broad-based program of theatre practice and study for the student who may wish to pursue in-depth studies in another area as well. It also serves as the core of studies for a student who wishes to pursue further theatre training in one of the BFA areas of concentration.

The undergraduate degrees in theatre emphasize knowledge and awareness of:

- the major works of dramatic literature that are representative of the most important eras in the development of theatre and drama;
- the history of theatrical production—its styles, conventions and socially related mores—from ancient civilizations to the present time;
- the various means through which a theatrical concept is realized; and
- the aesthetic and intellectual relationship between theatre in its various 21st century modes and contemporary society.

In addition, students completing a degree in theatre are expected to acquire the ability and skills to:

- analyze and interpret plays and performances with particular attention to acting and performance of literature, designing, directing and/or playwriting and criticism;
- use, with safety and efficiency, the tools and equipment basic to theatre production technology;
- communicate to an audience through at least one of the components of theatrical art: acting, directing, designing, playwriting or criticism; and

- function effectively as a collaborative member of a production team in the preparation of regularly scheduled public productions.

Concurrent Degree Program BA/MA in Theatre and Performance Studies

The University of Colorado Department of Theatre & Dance introduces the new BA/MA in Theatre and Performance Studies. This new program is an accelerated program aimed primarily at high-achieving undergraduates who may be planning to pursue a PhD at another institution and who wish to challenge themselves in advanced critical thinking.

Concurrent degrees at CU Boulder have been created in recognition of the increasing demand for master's level training and research skills. The BA/MA in Theatre and Performance Studies can give students advanced skills in a shorter amount of time using an integrated degree plan. A student can enter as a freshman theatre major and graduate with a BA and MA in Theatre within a five-year period (dependent upon criteria described below).

The typical student will be a student writing an honors thesis who will use that project as the basis for developing the MA thesis, though this is not mandatory. This new degree program is open only to students enrolled in the BA in Theatre degree program at the University of Colorado Boulder.

Minimum standards for admission require a cumulative GPA of 3.0 and completion of all MAPS deficiencies. Interested students should apply for admission to the BA/MA by December 15 of their junior year.

Students admitted to the concurrent degree program will undergo a mid-program review at the middle of the senior year to determine their eligibility to continue. Students not recommended for continuation in the concurrent degree program will be eligible to complete their bachelor's degree. To comply with Title IV Higher Education regulations, CU Boulder students pursuing a BA/MA degree will automatically be changed to graduate status after the completion of 130 credit hours. (Note: Students may take graduate courses prior to this formal admission into the Graduate School.) Upon successful completion of the concurrent degree program, both the bachelor's and master's degrees will be awarded simultaneously.

Basic Requirements and Minimum Standards

1. Students in the concurrent degree program must be full-time (average 24 credit hours per year), continuously enrolled students maintaining a minimum cumulative GPA of 3.0 throughout their enrollment.
2. Only currently enrolled, University of Colorado Boulder students may be considered for admission to the program. Transfer students must complete at least 24 credit hours as a degree-seeking student before applying to the program.
3. Students who are admitted to the concurrent degree program may not pursue a double degree or double major of any other kind.
4. Any MAPS deficiencies must be completed prior to admission to the concurrent degree program.
5. Issues of satisfactory academic progress, petition/appeal, transfer credit and grievance shall be monitored by the Theatre Director of Graduate Studies regarding departmental major requirements and minimum standards of achievement. In addition, the Dean of the Graduate School will consider appeals and review standards regarding Graduate School or university requirements and will confer with college Deans as appropriate for issues that cross undergraduate/graduate or school/college lines of authority.

6. Concurrent degree students may not take a leave of absence. Exceptions may be granted only after consideration by the Dean of the Graduate School based on a review of extenuating circumstances.
7. Time limits for the concurrent degree program will generally be 5 years, as specified in the departmental guidelines. Extensions of time limits will be approved only after consideration by the Dean of the Graduate School based on a review of extenuating circumstances.
8. Minimum cumulative GPA for all students enrolled in the concurrent degree program must be maintained at 3.0 for the duration of the program. The Graduate School will be responsible for monitoring the minimum standard and notifying students who are placed on probation. Concurrent degree students may not be admitted to a PhD program prior to completion of both the bachelor's and the master's degrees.
9. Students are awarded the undergraduate and master's degrees simultaneously at the completion of the concurrent degree program.
10. Concurrent students who are permitted by their department and the Graduate School to double count courses toward both the bachelor's and the master's degrees, as allowed by the approved concurrent degree proposal, may not use those overlapped courses toward a subsequent PhD at the University of Colorado Boulder.
11. Students in the concurrent degree program are generally not eligible for TA/RA appointments within the department.
12. Appeals related to the automatic change to graduate status may be considered in some extenuating circumstances. These appeals are made to the Office of the Registrar. Information on this process can be found at: <http://www.colorado.edu/registrar/bama-program>. All other appeals of, or requests for exceptions to concurrent degree standards, rules or policies of the departments, schools and colleges will be reviewed by the Dean of the Graduate School.

For more information, visit www.colorado.edu/theatredance/admissions/degrees/bama-theatre (<http://www.colorado.edu/theatredance/admissions/degrees/bama-theatre>).

Requirements

The BA degree program in Theatre and Performance Studies requires 44 credit hours in Theatre, 3 in Dance and 6 in Dramatic Literature and/or Global Arts outside the department. A grade of C- or better is needed in each required course toward the BA degree, as well as an overall theatre GPA of 2.00.

Required Courses and Semester Credit Hours

Required Courses

THTR 1003	Acting 1: Introduction to Acting	3
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
THTR 1105	Stage Technologies ¹	3
THTR 1115	Costume Technologies ¹	3
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
THTR 2105	Introduction to Performance Design	3
THTR 3035	Production Practicum	5
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2

THTR 4021	American Theatre and Drama	3
THTR 4149	Theatre Internship	1
Select one upper-division performance course from the following:		3
THTR 3043	Advanced Voice for the Stage	
THTR 3053	Acting 2	
THTR 4039	Musical Theatre Repertory	
THTR 4059	Open Topics in Theatre and Drama (certain topics)	
THTR 4063	Audition Techniques	
THTR 4073	Performing Voices of Women	
THTR 4103	Acting for the Camera	

Electives

Electives in Theatre (6 credit hours must be upper-division)	9
Electives in Dance	3
Electives in Dramatic Literature and/or Global Arts, outside the Department of Theatre & Dance, including at least 3 credit hours in upper-division	6
Total Credit Hours	53

¹ THTR 1105 and THTR 1115 cannot be taken in the same semester.

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BA in Theatre, students should meet the following requirements:

Course	Title	Credit Hours
Year One		
Fall Semester		
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
	Credit Hours	6
Spring Semester		
THTR 1105	Stage Technologies	3
THTR 1003	Acting 1: Introduction to Acting	3
THTR 3035	Production Practicum	1
Dance Elective		2
	Credit Hours	9
Year Two		
Fall Semester		
THTR 1115	Costume Technologies	3

THTR 2105	Introduction to Performance Design	3
		Credit Hours 6
Spring Semester		
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
		Credit Hours 3
Year Three		
Fall Semester		
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 3035	Production Practicum	2
THTR Performance Elective		3
Dance Elective		1
		Credit Hours 8
Spring Semester		
THTR 3035	Production Practicum	1
THTR Elective		3
Dramatic/Global Lit Elective		3
		Credit Hours 7
Year Four		
Fall Semester		
THTR 4021	American Theatre and Drama	3
THTR 4149	Theatre Internship	1
THTR Elective		3
		Credit Hours 7
Spring Semester		
THTR Elective		3
Dramatic/Global Lit Elective		3
THTR 3035	Production Practicum	1
		Credit Hours 7
		Total Credit Hours 53

Bachelor of Arts/Master of Arts (BAMA)

In addition to the BA requirements, BAMA students must complete the following requirements:

THTR 5011	Seminar: Theory and Criticism	3
THTR 5010	Introduction to Performance Studies	3
On-Stage Studies Courses (2)		6
THTR 6009	Research Strategies and Techniques	1

THTR 6959	Master's Thesis ¹	4
Graduate Electives ²		7
Total Credit Hours		24

¹ The Master's thesis is optional. Students choosing the thesis plan complete 4-6 thesis hours. Students choosing the non-thesis plan take additional electives.

² Thirty credit hours are required to complete the Master of Arts degree. BAMA students transfer six undergraduate credits toward their graduate degree.

Theatre - Bachelor of Fine Arts (BFA)

The BFA degree programs in Theatre offer preprofessional training to a limited number of highly motivated and talented students aiming at professional careers. The BFA student pursues one of four possible areas of concentration:

- Performance
- Design/Technology
- Management
- Musical Theatre

Admission Requirements

Admission is based on talent, academic record, motivation, auditions and/or interviews. Enrollment is limited to ensure individual attention necessary for effective training. Interested students should identify themselves as early as possible. Contact the department for information regarding how to apply to the BFA degree programs.

Formal application to the BFA Musical Theatre concentration should be made concurrently with an application to the University. Auditions and interviews will be held at the regular spring auditions for the College of Music.

Formal application to the BFA Performance concentration should be made at the beginning of the second semester.

Formal application to the BFA Design/Technology/Management concentrations should be made at the beginning of the third semester.

General Degree Requirements

The college counts a maximum of 67 credit hours of THTR credits toward the total credit hours required for graduation. A grade of C- or higher is needed in all required courses to fulfill the requirements of the BFA degree, as well as an overall theatre GPA of 2.00.

In addition to the specific course requirements listed for completing a BFA degree in Performance, Design/Technology, and Management concentrations, students must fulfill all requirements for the BA degree in Theatre.

In addition to the specific course requirements listed for completing BFA degrees in the Performance, Design/Technology, Management concentrations, and Musical Theatre, students must fulfill all requirements for the BA degree in theatre.

Performance Concentration

Students accepted into the BFA Performance concentration each year constitute an ensemble and as a group follow the required sequence of courses. Students in this concentration must fulfill the BA requirements

in Theatre, with specified electives, and are required to audition for theatre season productions each semester.

Required Courses and Semester Credit Hours

Course	Title	Credit Hours
Year One		
Fall Semester		
THTR 1003	Acting 1: Introduction to Acting	3
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
		Credit Hours
		9
Spring Semester		
THTR 1105	Stage Technologies	3
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
THTR 3035	Production Practicum	1
Dance Electives		2
		Credit Hours
		9
Year Two		
Fall Semester		
THTR 1115	Costume Technology	3
THTR 2043	Voice and Movement for the Stage	3
THTR 3013	Studio 1: Building a Character	3
		Credit Hours
		9
Spring Semester		
THTR 3023	Studio 2: Creating a Role	3
THTR 3033	Production Research and Practicum: Acting	1
THTR 3043	Advanced Voice for the Stage	3
		Credit Hours
		7

Year Three

Fall Semester

THTR 3033	Production Research and Practicum: Acting	1-3
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4033	Advanced Movement for the Stage	3
THTR 4013	Studio 3: Acting Shakespeare	3
THTR 4061	Directing	3
		Credit Hours
		12-14

Spring Semester

THTR 3035	Production Practicum	1
THTR 4023	Studio 4: Playing with Styles	3
THTR 4063	Audition Techniques	3
ENGL 3563	Shakespeare	3
Dance Elective		1
		Credit Hours
		11

Year Four

Fall Semester

THTR 3035 or THTR 3033	Production Practicum or Production Research and Practicum: Acting	1-2
THTR 4149	Theatre Internship	1
THTR 4193	Studio 5: Senior Project	3
THTR Elective		3
Lit/DAS Elective		3
		Credit Hours
		11-12

Spring Semester

THTR 3035	Production Practicum (Tech Studio)	1-2
THTR 4021	American Theatre and Drama	3

THTR Electives	3
Credit Hours	7-8
Total Credit Hours	75-79

Design/Technology or Stage Management Concentrations

Required Courses and Semester Credit Hours

Course	Title	Credit Hours
Year One		
Fall Semester		
THTR 1011	Global Theatre 1: Live Performance to Shakespeare	3
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
THTR 1105	Stage Technologies	3
		Credit Hours 9
Spring Semester		
THTR 1003	Acting 1: Introduction to Acting	3
THTR 1115	Costume Technology	3
THTR 2021	Global Theatre 2: Forms of Modern Theatre and Drama	3
THTR 3035	Production Practicum (Design)	1
		Credit Hours 10
Year Two		
Fall Semester		
THTR 2105	Introduction to Performance Design	3
THTR 3035	Production Practicum (Tech Studio)	2
Des/Tech Required Course		3
		Credit Hours 8
Spring Semester		
THTR 3035	Production Practicum	1

THTR 3045	Stage Management (Or Des/Tech Required Course)	3
Des/Tech Required Course		3
THTR 4555	Production Studio	1-2
		Credit Hours 8-9
Year Three		
Fall Semester		
THTR 3035	Production Practicum	1
THTR 3149	Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors	2
THTR 4555	Production Studio	1
Des/Tech Required Courses		6
Outside Elective		3
		Credit Hours 13
Spring Semester		
THTR 4555	Production Studio	1
Des/Tech Required Course		6
Outside Elective		3
		Credit Hours 10
Year Four		
Fall Semester		
THTR 4021	American Theatre and Drama	3
THTR 4149	Theatre Internship	1
THTR 4555	Production Studio	1-2
THTR Elective		3
Dance Elective		3
Outside Elective		3
		Credit Hours 14-15
Spring Semester		
THTR 4555	Production Studio	1
THTR Elective		3
Outside Elective		3
		Credit Hours 7
		Total Credit Hours 79-81

Musical Theatre Concentration

The BFA in Musical Theatre offers a rigorous concentration in theatre, music, and dance to a select number of highly disciplined, motivated, and talented students. In addition to the Arts & Sciences core curriculum, this concentration requires 60 credit hours: 26 credit hours in THTR, 4 credit hours in DNCE, and 30 credit hours in the College of Music.

Students must confirm their decision to enroll as TBFA-MUS major upon acceptance following the audition and must meet immediately with a departmental advisor.

During the application process, all potential BFA musical theatre students must declare in writing their intention to audition by submitting the appropriate pre-audition materials (www.colorado.edu/TheatreDance/admissions (<http://www.colorado.edu/theatredance/admissions>)).

Course	Title	Credit Hours
Year One		
Fall Semester		
THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
MUSC 1101	Semester 1 Theory	2
MUSC 1121	Aural Skills Lab, Semester 1	1
PMUS 1105	Keyboard Musicianship 1	1
PMUS 1726	Voice	2
	Credit Hours	9
Spring Semester		
THTR 1003	Acting 1: Introduction to Acting	3
THTR 3035	Production Practicum	1
MUSC 1111	Semester 2 Theory	2
MUSC 1131	Aural Skills Lab, Semester 2	1
PMUS 1205	Keyboard-Musicianship 2	1
PMUS 1726	Voice	2
	Credit Hours	10
Year Two		
Fall Semester		
THTR 1115	Costume Technology	3
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 2726	Voice	2
Dance Elective		2
	Credit Hours	10
Spring Semester		
THTR 3053	Acting 2	3
THTR 4039	Musical Theatre Repertory	3
THTR 3035	Production Practicum	1

PMUS 2726	Voice	3
	Credit Hours	10
Year Three		
Fall Semester		
THTR 1105	Stage Technology	3
THTR 3035	Production Practicum	1
PMUS 4157	Opera Practicum	1
Non-Western Music History		3
	Credit Hours	8
Spring Semester		
THTR 3011	American Musical Theatre History	3
PMUS 4157	Opera Practicum	1
Dance Elective		2
	Credit Hours	6
Year Four		
Fall Semester		
THTR 3035	Production Practicum (Tech Studio)	2
PMUS 4137	Opera Theatre 1	1
	Credit Hours	3
Spring Semester		
PMUS 4147	Opera Theatre 2	1
Western History Music Course		3
	Credit Hours	4
	Total Credit Hours	60

Graduating in Four Years with a BFA degree in Theatre

Consult the Four-Year Guarantee Requirements for information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress toward a BFA in theatre students should meet the following requirements:

- By Dec. 1 of the year before the first semester, declare in writing the intention to audition for the BFA in Musical Theatre.
- During the second semester (performance concentration) or third semester (design/technology and management concentrations), complete the audition and interview.
- Immediately upon acceptance into a BFA concentration declare the major.
- Once accepted into a BFA concentration, meet with a departmental advisor to confirm in writing specific courses to be completed within the remaining semesters of study.

Theatre - Minor

The minor in Theatre is designed to provide the student with a broad overview of theatre. Theatre minor declaration meetings are held twice a month. Students may view the schedule and sign up to attend a group declaration meeting by going to the following website: advising.colorado.edu (<http://advising.colorado.edu>)

Requirements

Requirements include a minimum of 19 credit hours from the courses below, 9 credit hours of which must be upper-division. Students must receive a minimum grade of C- in each THTR course, and a minimum of 2.00 GPA for all THTR courses. Transfer students may apply a maximum of 9 transfer hours with a maximum of 6 upper-division credit hours to the theatre minor. Students select courses from the theatre curriculum based on their interests and course availability.

Required Courses and Semester Credit Hours

Required Courses

Select one of the following:	3
THTR 1003 Acting 1: Introduction to Acting	
THTR 1009 Theatre and Society	
THTR 2105 Introduction to Performance Design	
Select one of the following:	3
THTR 1011 Global Theatre 1: Live Performance to Shakespeare	
THTR 2021 Global Theatre 2: Forms of Modern Theatre and Drama	
THTR 3011 American Musical Theatre History	
THTR 4021 American Theatre and Drama	
Select one of the following:	3
THTR 1105 Stage Technologies or THTR 111 Costume Technologies	
Additional Requirements	
THTR 3035 Production Practicum	
Run Crew is required, additional 2 credits can be another THTR 3035 or THTR 3033: Acting Practicum	3
Dance elective	1
Theatre electives (must be upper-division)	6
Total Credit Hours	19

Western American Studies

The Center of the American West offers an undergraduate certificate program in Western American Studies for students who have an intellectual commitment to any of a broad range of issues and aspects of the American West, including history and literature, culture and society and economic and environmental challenges facing western communities. Courses involve students in an exploration of the past, an appreciation for traditional and contemporary stories and art in the region and an understanding of western landscapes, ecosystems and the factors that affect them.

Course code for this program is CAMW.

Certificate

- Western American Studies - Certificate (p. 532)

CAMW 2001 (3) The American West

Students tour the cultural, social, and natural features of the American West, based on readings and presentations by guest speakers from the CU faculty and from important professions and positions in the West. Designed as the foundation course in the Western American Studies certificate program.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomores).

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: United States Context

CAMW 3939 (1-3) Center of the American West Internship

Work for public and private organizations on projects that enhance the understanding of various Western American topics and issues (environmental, cultural, public policy, etc.), and which foster students' development as community leaders working for a sustainable West.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CAMW 2001.

CAMW 4001 (3) Seminar on the American West

Interdisciplinary capstone seminar for the Western American Studies certificate program. Applies a selected natural science, social science, or humanities topic to the American West and addresses how westerners can make and sustain viable landscapes and communities.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CAMW 2001 and completion of Western American Studies certificate electives.

CAMW 4840 (1-4) Independent Study: The American West

Requisites: Requires prerequisite course of CAMW 2001 (minimum grade B). Restricted to students with 57-180 credits (Junior or Senior).

Western American Studies - Certificate

The certificate in Western American studies offers students at CU Boulder a unique regional studies curriculum. The interdisciplinary format allows an exploration of the region's characteristic and evolving issues: from its flora and fauna to its history and literature; and from the political, social, cultural, economic and environmental concerns facing Westerners to the landscapes and ecosystems that they inhabit.

The Center for the American West believes in community and in helping students feel more at home within the larger university. As such, the center hosts dinners each semester where students and faculty can get to know each other as well as various noteworthy featured guests in a more social, off-campus environment. Students enrolled in the program are also eligible to apply for the Beardsley Family Scholarship, and the center welcomes applications from all CU Boulder students for its annual Thompson Awards writing contest.

Requirements

The certificate requires 18 credit hours (9 of which must be at the upper division level) and includes an introductory course and a capstone course. It also allows students to choose the remaining four classes from a variety of academic areas. In this way, students are able to piece together a survey of the American West that aligns with their own unique interests.

Required Courses and Semester Credit Hours

Required Courses

CAMW 2001	The American West	3
CAMW 4001	Seminar on the American West	3
Electives		
Choose 4 courses from a variety of academic areas, as approved by the department		12
Total Credit Hours		18

Western Civilization Studies

The Center for Western Civilization, Thought & Policy (CWCTP) offers an undergraduate certificate program, Foundations of Western Civilization, for students interested in a rigorous grounding in Western culture. The certificate promotes critical reflection and academic research on the traditions and issues that characterize Western civilization through the study of Western culture, science and government in their ancient, medieval and modern forms. It helps students understand their role as citizens in a nation founded on the ancient ideals of consensual rule and republican government.

Course code for this program is CWCV.

Certificate

- Foundations of Western Civilization - Certificate (p. 533)

CWCV 2000 (3) The Western Tradition

Encourages a historical and critical investigation into the formative influences on what is often called Western culture, including religious, political, social and economic factors, and contemporary interpretations and critiques of these developments and concepts. Designed as the foundation course for the Center for Western Civilization.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Arts Sciences Special Courses

CWCV 4000 (3) Foundations of Western Civilization

Offers in-depth consideration of one or more foundational traditions in Western civilization. Focus changes from semester to semester, but possible topics include the Hebrew Bible, classical Greece, Islam, early Christianity, Persia, and North Africa. Designed as a senior seminar for the certificate in Western Civilization.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Arts Sciences Special Courses

Foundations of Western Civilization - Certificate

Our undergraduate certificate program is for students interested in a rigorous grounding in Western culture, reflecting on its traditions and values, and the certificate itself is the equivalent of an inter-disciplinary minor. The program allows students to study Western culture, science and government in their ancient, medieval and modern forms. The curriculum embraces over 30 courses taught by faculty in departments that include art history, classics, English, German, history, humanities, Italian, philosophy, political science and religious studies.

For more information on the program, requirements and current course offerings, visit the Center for Western Civilization, Thought & Policy (CWC)'s Certificate in Western Civilization (<http://www.colorado.edu/>

cwctp/student-resources/certificate-western-civilization) webpage, or contact CWC Director Robert Pasnau at 303-492-4837 or pasnau@colorado.edu.

Requirements

The interdisciplinary curriculum of over 30 courses is taught by faculty in departments that include: classics, English, history, philosophy, religious studies, and Germanic languages and literatures.

The certificate requires the completion with a grade of C- or better of eight courses (24 credit hours), of which 12 credit hours must be at the upper-division level. Up to three courses (or 9 credit hours) may come from the student's major.

In addition, students must fulfill the requirements for a BA in a major in a school or college at the University of Colorado Boulder.

Required Courses and Credit Hours

The required courses are offered each year. Students will enroll in one course from each cluster (9 hours total): literature, history and science.

The elective courses are offered regularly, but not each semester. Students are advised to check with the offering department regarding availability. Some courses may have prerequisites. Additional courses may be petitioned for inclusion in meeting certificate requirements through the center director.

Required Courses

<i>History</i>		3
Select one course from the following:		
HUMN 1120	Introduction to Humanities: Literature 2	
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600	
HIST 1012	Empire, Revolution and Global War: European History Since 1600	
HIST/CLAS 1051	The World of the Ancient Greeks	
HIST/CLAS 1061	The Rise and Fall of Ancient Rome	
CWCV 2000	The Western Tradition	
<i>Science</i>		3
Select one course from the following:		
PHIL 1400	Philosophy and the Sciences	
PHIL 3410	History of Science: Ancients to Newton	
PHIL 3430	History of Science: Newton to Einstein	
CLAS 2020	Science in the Ancient World	
<i>Literature</i>		3
Select one course from the following:		
HUMN 1110	Introduction to Humanities: Literature 1	
ENGL 2503	British Literary History to 1660	
ENGL 3000	Shakespeare for Nonmajors	
ENGL 3563	Shakespeare	
ENGL 3573	Shakespeare in Performance	
CLAS 1100	Greek Mythology	
CLAS 1120	Power and Passion in Ancient Rome	
Electives		15
<i>Art</i>		

ARTH 3019	Pompeii and the Cities of Vesuvius
ARTH 3029	Medieval and Early Modern Visual Culture, A.D. 400 to A.D. 1750
ARTH 3079	Medieval Art Survey
ARTH 3210	The Art of Renaissance Cities and Courts

Literature

SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700
SPAN 4620	Cervantes
ITAL 3160	Readings in Italian Literature—Medieval and Renaissance
HUMN 3310	The Bible as Literature
HUMN 3505	The Enlightenment: Tolerance and Emancipation
HUMN 3240	Tragedy
HUMN 4000	The Question of Romanticism
HUMN 4110	Greek and Roman Epic
HUMN 4120	Greek and Roman Tragedy
HUMN 4130	Greek and Roman Comedy
HUMN 4140	The Age of Dante: Readings from The Divine Comedy
HUMN 4150	Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages
GRMN 3502	Literature in the Age of Goethe
FREN 3110	Main Currents of French Literature 1
FREN 4350	French Enlightenment
ENGL 3553	Geoffrey Chaucer
ENGL 3583	Milton
ENGL 4113	History and Culture of Medieval England

History

HIST 4021	Athens and Greek Democracy
HIST 4031	Alexander the Great and the Rise of Macedonia
HIST 4061	Twilight of Antiquity
HIST 4081	The Roman Republic
HIST 4091	The Roman Empire
HIST 4122	Europe During the Renaissance
HIST 4212	The Age of Religious Wars: Reformation Europe, 1500-1648
HIST 4232	From Absolutism to Revolution in Europe, 1648-1789
HIST 4320	The History of the Mediterranean, 1000-1600
HIST 4454	Jewish Intellectual History
HIST 4511	Europe in the Dark Ages (400-1000 A.D.)
HIST 4521	Europe in the High Middle Ages (1000-1400 A.D.)

Ideas

RLST 3000	Christian Traditions
RLST 3100	Judaism
PHIL 3000	History of Ancient Philosophy
PHIL 3010	History of Modern Philosophy
PHIL 4030	Medieval Philosophy
GRMN 3505	The Enlightenment: Tolerance and Emancipation
GRMN 4502	Nietzsche: Literature and Values
CWCV 4000	Foundations of Western Civilization

Politics

PSCI 2004	Survey of Western Political Thought
HIST/CLAS 4041/PHIL 4210	Classical Greek Political Thought

Women and Gender Studies

The Department of Women and Gender Studies offers a bachelor of arts degree, a minor, an undergraduate certificate in global gender and sexuality studies as well as a graduate certificate for students enrolled in another disciplinary master's or doctoral degree program. The interdisciplinary field of women and gender studies offers students rigorous but flexible programs of study that examine women, gender and sexuality in relation to race, class, national identity and ability, among other variables. Students explore the ways that gender and sexuality work in diverse communities and in different cultural and historical contexts. Areas of inquiry include but are not limited to: gender/sex systems across cultures and historical periods; gender and sexuality in literature, the arts, and popular and media culture; legal and public policy issues around gender and sexuality; women's participation in social and cultural production; transnational feminisms; feminist and queer theories and their relation to different philosophical and epistemological traditions; and LGBTQI politics and histories.

The department houses a reading library and organizes colloquia, workshops and other cultural and educational events.

Many students incorporate their women and gender studies degree with other departmental offerings across campus, either as a second major, a minor, or a certificate. A graduate of the department who also completes studies in biology may attend medical school to specialize in women's health; by combining a women and gender studies degree with a focus in business, a graduate could better understand how gender affects the workplace. Students have coupled the critical thinking skills they learn in women and gender studies with additional fields of study from the College of Arts and Sciences or from other colleges or schools at CU Boulder. Students have gone on to careers in fields such as law, medicine, government, public health, social work, teaching, public policy, counseling, advocacy, media, public relations, academia, politics, fundraising, small business development, librarianship and arts administration, among others.

For more information, visit the Department of Women and Gender Studies (<http://www.colorado.edu/wgst>) website.

Course code for this program is WGST.

Bachelor's Degree

- Women and Gender Studies - Bachelor of Arts (BA) (p. 542)

Minor

- Women and Gender Studies - Minor (p. 545)

Certificate

- Global Gender and Sexuality Studies - Certificate (p. 541)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bayard de Volo, Lorraine M. (https://experts.colorado.edu/display/fisid_143611)

Associate Professor; PhD, University of Michigan Ann Arbor

Bowen, Scarlet (https://experts.colorado.edu/display/fisid_130905)

Lecturer; PhD, University of Texas at Austin

Buffington, Robert Marshall (https://experts.colorado.edu/display/fisid_144975)

Professor; PhD, University of Arizona

Bullington, Sam N (https://experts.colorado.edu/display/fisid_152528)

Instructor

David, Emmanuel A. (https://experts.colorado.edu/display/fisid_146542)

Assistant Professor; PhD, University of Colorado Boulder

Jacobs, Janet L (https://experts.colorado.edu/display/fisid_100744)

Professor; PhD, University of Colorado Boulder

Jaggar, Alison M (https://experts.colorado.edu/display/fisid_100454)

Professor; PhD, SUNY at Buffalo

Misri, Deepti (https://experts.colorado.edu/display/fisid_146428)

Associate Professor; PhD, University of Illinois at Urbana-Champaign

Montoya Kirk, Celeste Marie (https://experts.colorado.edu/display/fisid_144862)

Associate Professor; PhD, Washington University

Pois, Anne Marie

Professor Emeritus

WGST 1006 (3) The Social Construction of Sexuality

Discusses the social determinants of sexuality. Analyzes the economic, psychological and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 1006

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Sociology

WGST 1016 (3) Sex, Gender, and Society 1

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 1016

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Departmental Category: Sociology

WGST 1260 (3) Introduction to Women's Literature

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 1260

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: English

WGST 2000 (3) Introduction to Feminist Studies

Introduces students to the field of Women and Gender Studies. Examines gender issues in the United States from interdisciplinary, multicultural and feminist perspectives. Covers such topics as sexuality, beauty ideals, women's health, violence against women, work, the economy, peace and war and the environment.

Additional Information: Arts Sci Core Curr: Human Diversity

MAPS Course: Social Science

WGST 2020 (3) Femininities, Masculinities, Alternatives

Examines the construction of gender and sexual identities in the modern world. Focuses on the role of social attitudes and material circumstances in shaping how individuals understand themselves and are understood by others, as well as the actions they take to accept, negotiate and resist these pressures.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 2030 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay and transgender communities.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 2000

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: LGBT Studies

WGST 2050 (3) Gender, Sexuality, and Popular Culture

Explores diverse cultural forms such as film, popular fiction and non-fiction, music videos, public art, websites, blogs and zines which are shaped by, and in turn shape, popular understandings of gender at the intersections of race, class, ability, religion, nation and imperialism.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 2100 (3) Gender and Sexuality in Ancient Greece

Examines evidence of art, archaeology and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature and daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2100

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Classics

WGST 2110 (3) Gender and Sexuality in Ancient Rome

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2110

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Classics

WGST 2200 (3) Women, Literature, and the Arts

Introduces the contributions of women to literature and the performing arts from a historical and cross-cultural perspective. Emphasizes the cultural contexts in which artworks are created, as well as representations of gender and sexuality. Stresses issues of structure, content, and style, along with the acquisition of basic techniques of literary and arts criticism.

Recommended: Prerequisite WGST 2000.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Literature and the Arts

WGST 2290 (3) Philosophy and Women

Explores different approaches to the study of women.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 2290

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Philosophy

WGST 2400 (3) Women of Color and Activism

Studies the history of social activism in the United States by women of color, with an emphasis on modes of social activism, issues that have organized specific communities of color, issues that have crossed ethnic/racial boundaries and the interaction of women from different ethnic/racial groups, including women of color and white women.

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: GT Pathways: GT-H11 - History
Arts Sci Core Curr: United States Context

WGST 2600 (3) Gender, Race, and Class in a Global Context

Examines the positionality of women in terms of gender, race, ethnicity, class and power relations in a global context.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Asia Content

WGST 2700 (3) Psychology of Gender and Sexuality

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 2700

Recommended: Prerequisite WGST 2000 or PSYC 1001.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 2800 (3) Women and Religion

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism and goddess traditions.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2800

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Religious Studies

WGST 3004 (3) Women in Education

Honors women in education and their legacy. Introduces women educators, beginning in the late 19th century, whose significant theories of education and work in teaching have had an impact on all of our lives, in history and in society. Explores the educational theories and methods of several representative women educators and analyzes them through an investigation of their professional and personal lives.

Equivalent - Duplicate Degree Credit Not Granted: HONR 3004

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Honors

Departmental Category: Journalism

WGST 3012 (3) Women and Development

Investigates the status of women in the context of globalization and social and economic development.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3012

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Sociology

Departmental Category: Asia Content

WGST 3016 (3) Marriage and the Family in the United States

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3016

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: Sociology

WGST 3020 (3) Methods of Inquiry in Gender, Race, Class, and Sexuality

Examines various research methods and approaches in women's and gender studies. Students will gain practical experience to be able to write a proposal for a significant research project, informed by course readings and discussions.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3044 (3) Race, Class, Gender, and Crime

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3044 and SOCY 3044

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

Additional Information: Departmental Category: Sociology

WGST 3046 (3) Topics in Sex and Gender

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3046

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sociology

WGST 3100 (3) Feminist Theories

Explores a variety of alternative systematic accounts of, and explanations for, gender inequities. Social norms of both masculinity and femininity are analyzed in relation to other axes of inequality such as class, sexuality, race/ethnicity, neocolonialism and the domination of nonhuman nature.

Requisites: Requires a prerequisite course of WGST 2000 or WGST 2020 or WGST 2050 or WGST 2600 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 3110 (3) Feminist Practical Ethics

Explores a variety of personal and public policy issues in light of basic feminist commitment to opposing women's subordination. Provides students not only with a deeper understanding of the specific issues discussed but also with a sense of the ways in which a principled commitment to feminism may influence and be influenced by prevailing interpretations of contemporary ideals and values (such as freedom, equality and community). Provides an opportunity to develop skills of critical analysis useful in a wide range of contexts.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 3110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2000 or WGST 2290 or PHIL 2290.

Additional Information: Arts Sci Core Curr: Ideals and Values

WGST 3135 (3) Chicana Feminisms and Knowledges

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images and film portrayals.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3136

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chicano Studies

WGST 3174 (3) Sex, Power, and Politics: U.S. Perspectives

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted and changed by studying the politics of the women's, gay liberation and men's movements in the U.S.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3174

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

Additional Information: Departmental Category: Political Science

WGST 3200 (3) Religion and Feminist Thought

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3200

WGST 3201 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3202 and HEBR 3202 and RLST 3202

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 3208 (3) Women in Nordic Society: Modern States of Welfare

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture.

Equivalent - Duplicate Degree Credit Not Granted: SCAN 3208

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Nordic (Formerly Scandinavian)

WGST 3210 (3) American Indian Women

Explores the experiences, perspectives and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity and activism, especially in maintaining Indigenous traditions.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3213

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600 or ETHN 2001 or ETHN 1023.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 3220 (3) Women in Islam

Examines the historical and contemporary relation between women, gender and Islamic cultures in different parts of the world. We will consider the role and rights of women in Islam, historical and literary representations of Muslim women, and the historically changing constructions of gender and sexuality in Muslim societies. In addition, we will critically explore the construction of Muslim women in western discourses, including liberal feminist discourse, and ask whether the representation of Muslim women in these discourses achieves or undermines ends that we might consider "Feminist". In attending to the wide range of Muslim women's lived experiences in Islamic communities and cultures, as well as the self-representations of Muslim women themselves, our readings will urge us to reexamine our presumptions about piety, secularism, modernity and feminism.

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Departmental Category: Asia Content

WGST 3250 (3) Disney's Women and Girls

Examines the construction of gender, race, class, sexual orientation and disability in a selection of Disney's animated films. Cultivates skills of media literacy, exploring how mass media acts to enforce and maintain conventional gendered understandings of power, privilege and difference. Analyzes the political economy of the Disney phenomenon through a feminist lens.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 3267 (3) Women Writers

Introduces literature by British and American women.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3267

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: English

WGST 3300 (3) Gender, Sexuality and U.S. Law

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; discrimination based on sex and sexual orientation in education and in the workplace.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3301

Recommended: Prerequisite WGST 2000 or PSCI 1101.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Political Science

WGST 3302 (3) Facilitating Peaceful Community Change

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

Equivalent - Duplicate Degree Credit Not Granted: INVS 3302

WGST 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation and other identities in U.S. politics.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3311

WGST 3314 (3) Violence Against Women and Girls

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class and sexuality in gendered violence.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3314 and SOCY 3314

Recommended: Prerequisite SOCY 1016 or WGST 1016.

WGST 3400 (3) Gender, Personality, and Culture

Explores the relationship among gender, culture and personality. Brings together the disciplines of psychology and sociology in the study of gender and personality formation through investigation of psychoanalytic theory and the social environment.

Recommended: Prerequisite WGST 2000 or WGST 2700.

WGST 3410 (3) Gender, Sexuality and Culture in the Modern Middle East

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing and constructions of gender and sexuality have been shaped by local, national and international factors.

Equivalent - Duplicate Degree Credit Not Granted: ARAB 3410

Grading Basis: Letter Grade

Additional Information: Departmental Category: Arabic

WGST 3500 (3) Global Gender Issues

Introduces global gender issues, such as the gendered division of labor in the global economy, migration, women's human rights, environmental issues, gender violence in war, women in the military, nationalism and feminism and the representation of the Third World in the United States. Offers students the opportunity to broaden their perspectives beyond the borders of the United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2050 or WGST 2600.

Additional Information: Departmental Category: Asia Content

WGST 3505 (3) Historical and Contemporary Issues of African American Women

Explores the social, economic, political, historical and cultural role of African American women from an interdisciplinary perspective. Special emphasis is placed on African American women's rich oral and literary tradition.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3502

Recommended: Prerequisite WGST 2000 or ETHN 1022 or ETHN 2001.

WGST 3510 (3) Gender, Sexuality and Global Health

Examines the intersections of gender, sexuality and health in global perspective. Explores how men's and women's health are shaped by gender and sexual relations in a wide range of social contexts, including South and Southeast Asia, Latin America, sub-Saharan Africa and the United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Sociology

WGST 3600 (3) Latinas: History, Culture, and Social Activism

Drawing from work produced by and about Latinas, discusses the social and cultural construction of race and ethnicity, the function of nationalism, the politics of migration and citizenship, Latina literary production and theory, historiographical trends, Latina feminist theory, activism and the academy, and Latina/o political organizing.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3601 (3) German Women Writers

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form and feminism. Visual arts, film and feminist theory will also be considered in their relation to literature. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3601

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: German

WGST 3650 (3) Gender and Politics in Latin America

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations and the differential impact of political, economic, and social changes on men and women.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3052

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2600 or PSCI 2012 or PSCI 3032.

Additional Information: Departmental Category: Political Science

WGST 3670 (3) Gender, Race, Sexuality and Global Migration

Engages in an interdisciplinary study of the intersections of gender, race and sexuality that have created a multicultural, multiethnic and multiracial world. Focuses on the effects of political, economic, social and cultural forces on gender, race and sexuality in migrant communities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Ethnic Studies

WGST 3672 (3) Gender and the Global Economy

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation and women's social movements worldwide.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3672

Recommended: Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2002 or GEOG 2412 or WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Geography

WGST 3700 (3) Topics in U.S. Gender and Sexuality Studies

Examines selected topics in women, gender and sexuality in the US context.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3710 (3) Topics in Global Gender and Sexuality Studies

Content varies by semester and reflects relevant issues in global feminist scholarship.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3750 (3) Women in Buddhism

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra and contemporary issues such as the nun's revival moment.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3750

Additional Information: Departmental Category: Religious Studies
Departmental Category: Asia Content

WGST 3767 (3) Feminist Fictions

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality, and thereby the creative malleability, of gender itself. Some cinematic and performance texts will also be included.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3767

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: English

WGST 3800 (3) Advanced Writing in Feminist Studies

Offers expository writing and training in analytical and descriptive skills, structures or argument, critical thinking, the rhetoric of persuasion, and the development of a personal voice. Readings and papers focus on basic issues in gender studies.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Written Communication

WGST 3930 (1-6) Women and Gender Studies Internship

Provides field experience in local and national government and non-governmental agencies focusing on women and gender-related issues. Supervision by approved field instructors. Students must relate their academic experience to their field work experience through a portfolio and a final paper. Department enforced prerequisite: 6 hours of course work in Women and Gender Studies and 30 cumulative credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 3940 (1) Practicum in Women and Gender Studies

Enriches the academic experience of majors and minors within Women and Gender Studies. Usually will combine readings from books with lectures and discussions, community outreach and in-house publications spanning the interdisciplinary focus of the department.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to Womens Studies (WGST) majors or minors only.

Grading Basis: Letter Grade

WGST 4000 (3) Advanced Topics in Gender and Sexuality Studies

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

Equivalent - Duplicate Degree Credit Not Granted: WGST 5000

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 4010 (3) Gender, Genocide and Mass Trauma

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4000

Recommended: Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

Additional Information: Departmental Category: Sociology

WGST 4016 (3) Sex, Gender and Society 2

Studies status and power differences between the sexes at individual, group and societal levels. Examines empirically established sex differences and reviews biological, psychological and sociological explanations for gender differences.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4016

Requisites: Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sociology

WGST 4041 (3) Women and Theatre of the 20th and 21st Centuries

Explores a body of 20th and 21st century dramatic literature central to the study of women and theatre as well as the study of 20th and 21st century cultural history from a cross-national and multiracial feminist perspective. Major playwrights, particularly women from Asia, Africa and Europe, are read and discussed.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4041 and THTR 5041

Recommended: Prerequisite THTR 3031.

Additional Information: Departmental Category: Theatre

WGST 4063 (3) Women in Victorian England

Examines changing roles and status of women in a period of expansion. Studies the impact of industrialization on working women, sexuality, family planning, expansion of women in education, politics and the professions, the single women crisis and women's rights.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4063

Additional Information: Departmental Category: History

WGST 4073 (3) Performing Voices of Women

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4073

Additional Information: Departmental Category: Theatre

WGST 4086 (3) Family and Society

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic and economic determinants of family formation.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4086

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: Sociology

WGST 4277 (3) Topics in Women's Literature

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4277

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

WGST 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature. May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 4287 and ENGL 4287

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

WGST 4300 (3) Sex, Power, Politics: International Perspectives

Studies the commercial trade of sexual labor in the global economy, examining theories and assumptions about sexual-economic exchanges and gendered and racialized relations of power in the sex trade. Emphasizes prostitution.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2600 or WGST 3100.

WGST 4301 (3) Gender, Race and Immigration in Germany and Europe

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation and sexuality. Texts may include film, literature, television, magazine images. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4301 and GRMN 5301

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: German

WGST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture

Studies the construction, interconnections, and replications of gender, race, class and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

WGST 4400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: WGST 5400 and LGBT 4400 and LGBT 5400

Grading Basis: Letter Grade

Additional Information: Departmental Category: LGBT Studies

WGST 4471 (3) Women in 20th-21st Century Russian Culture

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4471 and RUSS 5471

Recommended: Prerequisite lower level literature or culture course.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Russian

WGST 4500 (3) Gender Politics and Global Activism

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 4391

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 4616 (3) History of Gender and Sexuality in the United States to 1870

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4616 and HIST 5616

Additional Information: Departmental Category: History

WGST 4619 (3) Women in East Asian History

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state and cultural systems. Topic varies in any given semester.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4619 and HIST 5619

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: History
Departmental Category: Asia Content

WGST 4620 (3) A Global History of Sexuality: The Modern Era

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4620

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 4626 (3) History of Gender and Sexuality in the United States from 1870

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4626

Additional Information: Departmental Category: History

WGST 4636 (3) Lesbian and Gay History: Culture and Politics and Social Change in the U.S.

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics and queer cultural resistance.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4636 and HIST 5636

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite HIST 1015 or HIST 1025 or LGBT 2000 or WGST 2000 or WGST 2600.

WGST 4640 (3) Women, Gender and War

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4640

Recommended: Prerequisite HIST 1015 or HIST 1020 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

Additional Information: Departmental Category: History

WGST 4769 (3) Gender Studies in Early Modern Visual Culture

Examines 15th and 16th century European ideas about women from a variety of feminist perspectives. Focuses on recent contributions to history of women as they intersect with the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4769

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art and Art History

WGST 4800 (3) Senior Colloquium in Feminist Studies

Provides students with the opportunity to actively reflect on their education and to complete a research project that incorporates an interdisciplinary and feminist approach to the study of gender, class, race, ethnicity and sexuality. Offered each spring.

Requisites: Requires prerequisite courses of WGST 2000 and WGST 2600 and WGST 3100 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Womens Studies (WGST) majors or minors only.

WGST 4840 (1-6) Independent Study

Department enforced prerequisite: over minimum GPA of 3.3.

Repeatable: Repeatable for up to 7.00 total credit hours.

WGST 4850 (3) Gender in Hagiography

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources, and examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4850 and RLST 5850

Grading Basis: Letter Grade

Additional Information: Departmental Category: Religious Studies

WGST 4950 (3) Honors Research

For qualified Women and Gender Studies majors working on the research phase of departmental honors. Department enforced prerequisite: overall GPA of 3.3.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course

WGST 4999 (1-3) Senior Honors Thesis

Qualified Women and Gender Studies majors may write an honors thesis, an in-depth research paper, on a topic of choice. Thesis hours available to majors only after successfully completing the research phase.

Requisites: Restricted to Womens Studies (WGST) majors only.

Additional Information: Arts Sciences Honors Course

Global Gender and Sexuality Studies - Certificate

The Department of Women and Gender Studies offers an undergraduate certificate in global gender and sexuality studies. The ever-increasing movement of people, commodities, politics and culture—"globalization"—impacts all of us in different ways. The Certificate in Global Gender and Sexuality Studies provides students with an opportunity to study how individuals and groups from diverse gender, racial, ethnic, national, class and sexual backgrounds live in and engage with the world and how processes of global change affect gender relations locally, nationally and internationally. The certificate is designed for students who wish to understand, analyze and respond to these dramatic global transformations and their impact on women and gender relations, complementing students' majors and interests and preparing them for graduate studies and employment.

This interdisciplinary undergraduate certificate program is designed to take advantage of the research strengths of the department's core and associate faculty and to enhance the experience of undergraduate students in any major, including international affairs, political science, history, ethnic studies, geography, English, anthropology, sociology, integrative physiology, environmental studies and many others. Career

specialization in international gender and sexuality has grown in both the private and public sectors, in fields including international development, finance, public health, public policy and education.

For more details including application instructions, visit the undergraduate certificate (<http://www.colorado.edu/wgst/ggss>) webpage, or email wgst@colorado.edu.

Requirements

Certificate requirements include 18 credit hours of specified course work, including 12 credit hours at the upper-division level. For more details including application instructions, visit the undergraduate certificate webpage, or email wgst@colorado.edu.

Required Courses and Credit Hours

Lower-Division Required Course

WGST 2600	Gender, Race, and Class in a Global Context	3
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Upper-Division Required Courses (must select two of the following courses)

WGST 3500	Global Gender Issues	6
WGST 3510	Gender, Sexuality and Global Health	
WGST 3650	Gender and Politics in Latin America	
WGST 3710	Topics in Global Gender and Sexuality Studies	
WGST 4010/ SOCY 4000	Gender, Genocide and Mass Trauma	
WGST 4300	Sex, Power, Politics: International Perspectives	
WGST 4500/ PSCI 4391	Gender Politics and Global Activism	
WGST/HIST 4620	A Global History of Sexuality: The Modern Era	

Elective Courses

Lower-Division Electives (no more than 3 credit hours)

WGST 2050	Gender, Sexuality, and Popular Culture	9
ANTH 1170	Exploring Culture and Gender through Film	
LING 2400	Language, Gender and Sexuality	

Upper-Division Electives (students may draw from the upper-division requirements listed above as well as the following courses, 6-9 credit hours)

WGST/SOCY 3012	Women and Development	9
WGST 3201/ JWST 3202/ RLST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions	
WGST/SCAN 3208	Women in Nordic Society: Modern States of Welfare	
WGST 3210/ ETHN 3213	American Indian Women	
WGST 3220	Women in Islam	
WGST 3670	Gender, Race, Sexuality and Global Migration	
WGST 3672	Gender and the Global Economy	
WGST/GRMN 4301	Gender, Race and Immigration in Germany and Europe	
WGST/HIST 4619	Women in East Asian History	
WGST/HIST 4640	Women, Gender and War	

ETHN/FILM 4001	Screening Race, Class & Gender in the U.S. and the Global Borderland
ANTH 4505	Globalization and Transnational Culture

Total Credit Hours 18

Appropriate topics courses offered by other departments and programs—those that deal centrally with issues of gender and/or sexuality in global context—may count for upper division elective credit with the permission of the department's director of undergraduate studies. Students must get the director's approval beforehand, or credit toward the certificate is not guaranteed.

Study Abroad and CU Global Seminars

Appropriate study abroad courses and CU Global Seminars that deal centrally with issues of gender and/or sexuality in global context may count for lower- or upper-division elective credit with the permission of the department's director of undergraduate studies. Only CU-sponsored study abroad programs and Global Seminars will count as CU credit. Appropriate study abroad courses taken through other accredited study abroad programs may count for elective transfer credit with the permission of the director of undergraduate studies. In all of these cases, students must get the director's approval beforehand, or credit toward the certificate is not guaranteed.

Women and Gender Studies - Bachelor of Arts (BA)

The interdisciplinary women and gender studies undergraduate major and minor offer students a rigorous but flexible program of study that examines women, gender and sexuality in relation to race, class, national identity and ability, among other variables. Students explore the ways that gender and sexuality work in diverse communities and in different cultural and historical contexts. Drawing from approximately 50 courses, many cross-listed with other academic units, students fulfill the requirements of the major or minor and can design an emphasis relevant to their special interests by focusing on one of three cognate areas: 1) gender/sexuality, 2) race/ethnicity and 3) global/transnational.

Requirements

Students must complete the general requirements of the College of Arts and Sciences and the required courses listed below.

Students must complete a minimum of 36 credit hours with grades of C- or better in approved women and gender studies courses, a minimum of 24 credit hours of which must be upper-division (3000- or 4000-level).

Required Courses and Semester Credit Hours

Required Courses

WGST 2000	Introduction to Feminist Studies	3
WGST 2600	Gender, Race, and Class in a Global Context	3
WGST 3100	Feminist Theories	3
WGST 4800	Senior Colloquium in Feminist Studies	3

Cognate Areas

At least three courses, one from each of the three cognate areas (see below)

Electives¹

Three upper-division approved WGST elective courses (those listed under upper-division electives or cognate areas below)

Two additional lower- or upper-division approved WGST elective courses (see below)	6
Total Credit Hours	36

¹ Internships and independent study credit hours may apply, as well as special topics courses (WGST 3700, WGST 3710 and WGST 4000); see advisor or department for more information.

Cognate Areas

Students must take three courses (for a total of 9 credit hours), one each from the three following cognate areas. Select topics offerings of special topics courses (WGST 3700, WGST 3710 and WGST 4000) may apply to cognate areas; see advisor or department for more information.

Gender/Sexuality Cognate Area

At least one course (3 credit hours) from the gender/sexuality cognate area

LGBT 3796	Queer Theory	3
WGST/SOCY 3046	Topics in Sex and Gender	
WGST 3250	Disney's Women and Girls	
WGST 3300	Gender, Sexuality and U.S. Law	
WGST 3510	Gender, Sexuality and Global Health	
WGST 3767	Feminist Fictions	
WGST 4010	Gender, Genocide and Mass Trauma	
WGST 4016	Sex, Gender and Society 2	
WGST 4287	Special Topics in LGBT Literature	
WGST 4400	Critical Inquiries in Transgender Studies	
WGST 4620	A Global History of Sexuality: The Modern Era	
WGST 4636	Lesbian and Gay History: Culture and Politics and Social Change in the U.S.	
WRTG 3020	Topics in Writing (select topics only; see advisor or department for approved topics)	

Race/Ethnicity Cognate Area

At least one course (3 credit hours) from the race/ethnicity cognate area

ETHN 3026	Women of Color: Chicanas in U.S. Society	3
WGST/ETHN/SOCY 3044	Race, Class, Gender, and Crime	
WGST 3135/ETHN 3136	Chicana Feminisms and Knowledges	
WGST 3210/ETHN 3213	American Indian Women	
WGST/PSCI 3311	Gender and U.S. Politics: Protest, Polls and Policy	
WGST 3505	Historical and Contemporary Issues of African American Women	
WGST 3600	Latinas: History, Culture, and Social Activism	
WGST/MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
WGST/HIST 4619	Women in East Asian History	

Global/Transnational Cognate Area

At least one course (3 credit hours) from the global/transnational cognate area

WGST/SOCY 3012	Women and Development	
WGST 3220	Women in Islam	
WGST 3500	Global Gender Issues	
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)	
WGST 3650/PSCI 3052	Gender and Politics in Latin America	
WGST 3670	Gender, Race, Sexuality and Global Migration	
WGST/GEOG 3672	Gender and the Global Economy	
WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)	
WGST 4300	Sex, Power, Politics: International Perspectives	
WGST/GRMN 4301	Gender, Race and Immigration in Germany and Europe	
WGST 4500/PSCI 4391	Gender Politics and Global Activism	
WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)	

Lower-Division Electives

No more than 6 credit hours of lower-division electives 0-6

LING 2400	Language, Gender and Sexuality	
LGBT/ENGL 2707	Introduction to Lesbian, Bisexual, and Gay Literature	
WGST/SOCY 1006	The Social Construction of Sexuality	
	or WGST 101 Sex, Gender, and Society 1	
	or SOCY 101 Sex, Gender, and Society 1	
WGST/ENGL 1260	Introduction to Women's Literature	
WGST 2020	Femininities, Masculinities, Alternatives	
WGST 2030/LGBT 2000	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies	
WGST 2050	Gender, Sexuality, and Popular Culture	
WGST 2200	Women, Literature, and the Arts	
WGST 2400	Women of Color and Activism	
WGST/PSYC 2700	Psychology of Gender and Sexuality	

Upper-Division Electives

Select additional courses from the three cognate areas above or from the following upper-division electives below, total credits toward the degree must equal 36 credit hours

ARTH 3209	Art, Culture, and Gender Diversity, 1400–1600: Renaissance Art Out of the Canon	
ENGL 3217	Topics in Gender Studies	
FILM 3013	Women and Film	
ITAL 4730	Italian Feminisms: Culture, Theory, and Narratives of Difference	
WGST/SOCY 3016	Marriage and the Family in the United States	

WGST 3020	Methods of Inquiry in Gender, Race, Class, and Sexuality	
WGST/PHIL 3110	Feminist Practical Ethics	
WGST/PSCI 3174	Sex, Power, and Politics: U.S. Perspectives	
WGST/JWST 3200	Religion and Feminist Thought	
WGST 3201/ JWST 3202/ RLST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions	
WGST/ENGL 3267	Women Writers	
WGST/INVS 3302	Facilitating Peaceful Community Change	
WGST/ETHN/ SOCY 3314	Violence Against Women and Girls	
WGST/ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East	
WGST/GRMN 3601	German Women Writers	
WGST/RLST 3750	Women in Buddhism	
WGST 3800	Advanced Writing in Feminist Studies	
WGST/THTR 4041	Women and Theatre of the 20th and 21st Centuries	
WGST 4063	Women in Victorian England	
WGST/THTR 4073	Performing Voices of Women	
WGST/SOCY 4086	Family and Society	
WGST/ENGL 4277	Topics in Women's Literature	
WGST/RUSS 4471	Women in 20th-21st Century Russian Culture	
WGST/HIST 4616	History of Gender and Sexuality in the United States to 1870	
WGST/HIST 4626	History of Gender and Sexuality in the United States from 1870	
WGST/RLST 4850	Gender in Hagiography	

Honors

Students may take up to 6 credit hours of honors in women and gender studies; credit hours apply to upper-division electives in the major.

For more information about pursuing departmental honors, visit the department honors (<http://www.colorado.edu/wgst/students/undergraduates/wgst-honors-program>) webpage and the main Honors Program (<http://www.colorado.edu/honors/graduation>) webpage describing qualifications, requirements and deadlines.

WGST 4950	Honors Research	3
WGST 4999	Senior Honors Thesis	1-3

Internship

Students may take up to 6 credit hours of internship in women and gender studies; credit hours apply to upper-division electives in the major. See the College of Arts and Sciences guidelines (<http://>

www.colorado.edu/advising/sites/default/files/attached-files/internshipcredit_0.pdf) for earning internship credit.

WGST 3930	Women and Gender Studies Internship	1-6
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Special Topics

Students may take up to 6 credit hours in WMST topics courses; course topics vary each semester. Ask the women and gender studies advisor or department about how each course applies to major cognate area requirements, if applicable.

WGST 3700	Topics in U.S. Gender and Sexuality Studies	3
WGST 3710	Topics in Global Gender and Sexuality Studies	3
WGST 4000	Advanced Topics in Gender and Sexuality Studies	3

Graduating in Four Years

Consult the Four-Year Guarantee Requirements for more information on eligibility. The concept of "adequate progress" as it is used here only refers to maintaining eligibility for the four-year guarantee; it is not a requirement for the major. To maintain adequate progress in women and gender studies, students should meet the following requirements:

- By the beginning of the second semester, declare the major.
- By the end of the fourth semester, complete WGST 2000 and WGST 2600 and 9 additional credit hours of major requirements.
- By the end of the sixth semester, complete WGST 3100 and 9 additional credit hours of major requirements (27 credit hours total of the major requirements completed).
- During the seventh and eighth semester, complete WGST 4800 and 6 additional credit hours of the major requirements.

Students should consult with their advisor for specific recommendations. The following sample plan will outline the major requirements, but the order of some classes can vary greatly. It is important for students to check the degree audit and work with the major advisor each semester to make sure of the requirements and graduation timeline.

Course	Title	Credit Hours
Year One		
Fall Semester		
WGST 2000 or WGST 2600	Introduction to Feminist Studies or Gender, Race, and Class in a Global Context	3
	Credit Hours	3

Spring Semester			
WGST 2600 or WGST 2000	Gender, Race, and Class in a Global Context or Introduction to Feminist Studies	3	
	Credit Hours	3	
Year Two			
Fall Semester			
WMST Lower- or upper- division elective		3	
	Credit Hours	3	
Spring Semester			
WMST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
WMST Lower- or upper- division elective		3	
	Credit Hours	6	
Year Three			
Fall Semester			
WMST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
WMST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
	Credit Hours	6	
Spring Semester			
WGST 3100	Feminist Theories	3	
WMST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
	Credit Hours	6	
Year Four			
Fall Semester			
WMST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
	Credit Hours	3	
Spring Semester			
WGST 4800	Senior Colloquium in Feminist Studies	3	
WMST Cognate area requirement or upper-division elective (one course from each of three cognate areas required)		3	
	Credit Hours	6	
	Total Credit Hours	36	

design an emphasis relevant to their special interests by focusing on one of three cognate areas: 1) gender/sexuality, 2) race/ethnicity, and 3) global/transnational.

Declaration of a minor is open to any student enrolled at CU Boulder, regardless of college or school.

Requirements

Students must complete a minimum of 21 credit hours with grades of C- or better in approved women and gender studies courses, 12 credit hours of which must be upper-division (3000- or 4000-level).

Required Courses and Credit Hours

Required Courses

WGST 2000	Introduction to Feminist Studies	3
WGST 2600	Gender, Race, and Class in a Global Context	3
WGST 3100	Feminist Theories	3

Cognate Areas

One courses each from two of the three cognate areas (see below)	6
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Electives ¹

Any upper-division course listed below under upper-division electives or cognate areas not used to fulfill any other minor requirements.	3
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Any lower- or upper-division course listed below that has not been used to fulfill any other minor requirements.	3
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Total Credit Hours	21
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¹ Internships and independent study credit hours may apply, as well as special topics courses (WGST 3700, WGST 3710 and WGST 4000); see advisor or department for more information.

Cognate Areas

Students must take one course each from two different cognate areas for a total of 6 credit hours. Select topics offerings of special topics courses (WGST 3700, WGST 3710 and WGST 4000) may apply to cognate areas; see advisor or department for more information.

Gender/Sexuality Cognate Area

Gender/Sexuality		0-3
LGBT 3796	Queer Theory	
WGST/SOCY 3046	Topics in Sex and Gender	
WGST 3250	Disney's Women and Girls	
WGST 3300/PSCI 3301	Gender, Sexuality and U.S. Law	
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)	
WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)	
WGST 4010/SOCY 4000	Gender, Genocide and Mass Trauma	
WGST/SOCY 4016	Sex, Gender and Society 2	
WGST/LGBT 4287	Special Topics in LGBT Literature	
WGST/LGBT 4400	Critical Inquiries in Transgender Studies	

Women and Gender Studies - Minor

The interdisciplinary women and gender studies minor offer students a rigorous but flexible program of study that examines women, gender and sexuality in relation to race, class, national identity and ability, among other variables. Students explore the ways that gender and sexuality work in diverse communities and in different cultural and historical contexts. Drawing from approximately 50 courses, many cross-listed with other academic units, students fulfill the requirements of the minor and can

WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)
WGST/HIST 4636	Lesbian and Gay History: Culture and Politics and Social Change in the U.S.
WRTG 3020	Topics in Writing (select topics only; see advisor or department for approved topics)

Race/Ethnicity Cognate Area

Race/Ethnicity	0-3
ETHN 3026	Women of Color: Chicanas in U.S. Society
WGST/ETHN/ SOCY 3044	Race, Class, Gender, and Crime
WGST 3135/ ETHN 3136	Chicana Feminisms and Knowledges
WGST 3210/ ETHN 3213	American Indian Women
WGST/PSCI 3311	Gender and U.S. Politics: Protest, Polls and Policy
WGST 3505	Historical and Contemporary Issues of African American Women
WGST 3600	Latinas: History, Culture, and Social Activism
WGST/MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture
WGST/HIST 4619	Women in East Asian History

Global/Transnational Cognate Area

Global/Transnational	0-3
WGST/SOCY 3012	Women and Development
WGST 3220	Women in Islam
WGST 3500	Global Gender Issues
WGST 3510	Gender, Sexuality and Global Health (may count for gender/sexuality or global/transnational, but not both)
WGST 3650/ PSCI 3052	Gender and Politics in Latin America
WGST 3670	Gender, Race, Sexuality and Global Migration
WGST/GEOG 3672	Gender and the Global Economy
WGST/ENGL 3767	Feminist Fictions (may count for gender/sexuality or global/transnational, but not both)
WGST 4300	Sex, Power, Politics: International Perspectives
WGST/GRMN 4301	Gender, Race and Immigration in Germany and Europe
WGST 4500/ PSCI 4391	Gender Politics and Global Activism
WGST/HIST 4620	A Global History of Sexuality: The Modern Era (may count for gender/sexuality or global/transnational, but not both)

Lower-Division Electives

Students may take no more than 3 credit hours of lower-division electives.

Lower-division electives 0-3

LING 2400	Language, Gender and Sexuality
LGBT/ENGL 2707	Introduction to Lesbian, Bisexual, and Gay Literature
WGST/SOCY 1006	The Social Construction of Sexuality
	or WGST 101 Sex, Gender, and Society 1
	or SOCY 101 Sex, Gender, and Society 1
WGST/ENGL 1260	Introduction to Women's Literature
WGST 2020	Femininities, Masculinities, Alternatives
WGST 2030/ LGBT 2000	Introduction to Lesbian, Gay, Bisexual, and Transgender Studies
WGST 2050	Gender, Sexuality, and Popular Culture
WGST 2200	Women, Literature, and the Arts
WGST 2400	Women of Color and Activism
WGST/PSYC 2700	Psychology of Gender and Sexuality

Upper-Division Electives

Select an additional course or courses from the three cognate areas above or from the following upper-division electives listed below to bring the total credit hours in the minor to 21 and the total upper-division credit hours in the minor to 12.

Upper-Division Electives	3-6
ARTH 3209	Art, Culture, and Gender Diversity, 1400-1600: Renaissance Art Out of the Canon
ENGL 3217	Topics in Gender Studies
FILM 3013	Women and Film
ITAL 4730	Italian Feminisms: Culture, Theory, and Narratives of Difference
WGST/SOCY 3016	Marriage and the Family in the United States
WGST 3020	Methods of Inquiry in Gender, Race, Class, and Sexuality
WGST/PHIL 3110	Feminist Practical Ethics
WGST/PSCI 3174	Sex, Power, and Politics: U.S. Perspectives
WGST/JWST 3200	Religion and Feminist Thought
WGST 3201/ JWST 3202/ RLST 3202	Women, Gender & Sexuality in Jewish Texts & Traditions
WGST/ENGL 3267	Women Writers
WGST/INVS 3302	Facilitating Peaceful Community Change
WGST/ETHN/ SOCY 3314	Violence Against Women and Girls
WGST/ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST/GRMN 3601	German Women Writers
WGST/RLST 3750	Women in Buddhism

WGST 3800	Advanced Writing in Feminist Studies
WGST/THTR 4041	Women and Theatre of the 20th and 21st Centuries
WGST 4063	Women in Victorian England
WGST/THTR 4073	Performing Voices of Women
WGST/SOCY 4086	Family and Society
WGST/ENGL 4277	Topics in Women's Literature
WGST/RUSS 4471	Women in 20th-21st Century Russian Culture
WGST/HIST 4616	History of Gender and Sexuality in the United States to 1870
WGST/HIST 4626	History of Gender and Sexuality in the United States from 1870
WGST/RLST 4850	Gender in Hagiography

Byrd, Sigman M. (https://experts.colorado.edu/display/fisid_127494)
Senior Instructor; PhD, University of Utah

Dickson, Rebecca (https://experts.colorado.edu/display/fisid_105043)
Senior Instructor; PhD, University of Colorado Boulder

Doersch, Charles Robert (https://experts.colorado.edu/display/fisid_135258)
Lecturer; MFA, Columbia University In the City of New York

Doyle, Damian P (https://experts.colorado.edu/display/fisid_100290)
Senior Instructor; PhD, University of Colorado Boulder

Dukehart, Merrit Elizabeth (https://experts.colorado.edu/display/fisid_149583)
Instructor; PhD, University of Colorado Boulder

Ellis, Jay (https://experts.colorado.edu/display/fisid_122674)
Senior Instructor; PhD, New York University

Feldman, Andrea (https://experts.colorado.edu/display/fisid_101230)
Senior Instructor; PhD, University of Colorado Boulder

Ferrell, Tracy L (https://experts.colorado.edu/display/fisid_101540)
Senior Instructor; PhD, University of Colorado Boulder

Green, Sally Edith (https://experts.colorado.edu/display/fisid_122076)
Senior Instructor

Gries, Laurie Ellen (https://experts.colorado.edu/display/fisid_155951)
Assistant Professor; PhD, Syracuse University

Hargraves, Orin (https://experts.colorado.edu/display/fisid_153662)
Lecturer

Henningsen, Matthew Scott (https://experts.colorado.edu/display/fisid_156802)
Lecturer

Hersh, Orly M (https://experts.colorado.edu/display/fisid_143580)
Senior Instructor; MA, Northern Arizona University

House, Veronica Leigh (https://experts.colorado.edu/display/fisid_143544)
Senior Instructor; PhD, University of Texas at Austin

Klinger, Eliza G (https://experts.colorado.edu/display/fisid_135110)
Instructor; MA, New Mexico State University

Klinger, Eric O (https://experts.colorado.edu/display/fisid_139359)
Senior Instructor; MA, New Mexico State University

Knowlton, Jennifer H (https://experts.colorado.edu/display/fisid_112458)
Senior Instructor; MA, University of Colorado Boulder

Kratzke, Peter J (https://experts.colorado.edu/display/fisid_126546)
Senior Instructor; PhD, University of Kentucky

Kunce, Catherine (https://experts.colorado.edu/display/fisid_120631)
Senior Instructor; PhD, University of Denver

Lagman, Eileen Anne (https://experts.colorado.edu/display/fisid_156308)
Assistant Professor; MA, DePaul University

Writing and Rhetoric, Program for

The Program for Writing and Rhetoric (PWR) is a free-standing unit in the College of Arts and Sciences responsible for campus-wide instruction in writing. The program coordinates and oversees all writing curricula and instruction intended to meet college and campus requirements, including efforts in specific disciplines and targeted campus programs.

The program is committed to training students to think critically about the texts they read and the writing they produce, and to enable them to shape and express ideas with clarity and grace in any context: academic, professional or civic. Classes are generally conducted as intensive writing workshops, placing a premium on thoughtful, substantive revision.

The program offers both lower-division and upper-division courses, as well as some graduate seminars. Certain undergraduate courses fulfill the College of Arts and Sciences written communication requirement, and some also fulfill graduation requirements in other colleges. Students should check with their advisors to be sure that they are taking the right course to fulfill their requirement.

For information about specific classes and their instructors, students should visit www.colorado.edu/pwr (<http://www.colorado.edu/pwr>).

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackerman, John Martin (https://experts.colorado.edu/display/fisid_144951)
Associate Professor; PhD, Carnegie Mellon University

Albert, Michelle A. (https://experts.colorado.edu/display/fisid_134708)
Senior Instructor; MFA, Naropa Institute

Bliss, Anne
Professor Emeritus

Burger, Eric B (https://experts.colorado.edu/display/fisid_143577)
Senior Instructor; PhD, University of Utah

Lamos, Steven Joseph (https://experts.colorado.edu/display/fisid_141169)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Lyons, Tim (https://experts.colorado.edu/display/fisid_100214)
Instructor; MA, Johns Hopkins University

Macdonald, Christine (https://experts.colorado.edu/display/fisid_105513)
Senior Instructor; PhD, University of Colorado Boulder

Massey-Warren, Sarah (https://experts.colorado.edu/display/fisid_145057)
Instructor; PhD, University of Colorado Boulder

Miller, Olivia Kour (https://experts.colorado.edu/display/fisid_145260)
Instructor; PhD, SUNY at Binghamton

Min, Young Kyung (https://experts.colorado.edu/display/fisid_156466)
Instructor; PhD, University of Illinois at Urbana-Champaign

Myers, Seth G (https://experts.colorado.edu/display/fisid_153207)
Instructor; MA, University of Alaska Fairbanks

Norgaard, Rolf P (https://experts.colorado.edu/display/fisid_102502)
Senior Instructor; PhD, Stanford University

Pearce, Lonni Dee (https://experts.colorado.edu/display/fisid_134710)
Senior Instructor; PhD, University of Arizona

Pieplow, Kathryn (https://experts.colorado.edu/display/fisid_123285)
Senior Instructor; JD, University of South Dakota

Pieplow, Nathan D (https://experts.colorado.edu/display/fisid_131512)
Instructor; MEd, University of Oregon

Reilly, Kerry Anne (https://experts.colorado.edu/display/fisid_131502)
Senior Instructor; MFA, University of Iowa

Rivera, John-Michael (https://experts.colorado.edu/display/fisid_118393)
Associate Professor; PhD, University of Texas at Austin

Schaberg, Petger J (https://experts.colorado.edu/display/fisid_103135)
Senior Instructor; MA, University of Colorado Boulder

Sullivan, Patricia A (https://experts.colorado.edu/display/fisid_126640)
Professor; PhD, Ohio State University

von der Nuell, Tobin D (https://experts.colorado.edu/display/fisid_113896)
Senior Instructor; MA, University of Colorado Boulder

Wenger, Paula (https://experts.colorado.edu/display/fisid_113621)
Senior Instructor; MA, Miami University Oxford Campus

Wilkerson, Donald H (https://experts.colorado.edu/display/fisid_104406)
Senior Instructor; MA, University of Colorado Boulder

Zigmond, Rosalyn H (https://experts.colorado.edu/display/fisid_127550)
Instructor; PhD, University of Colorado Denver

Zizzi, Michael P. (https://experts.colorado.edu/display/fisid_143861)
Instructor

WRTG 1100 (4) Extended First-Year Writing and Rhetoric

Extended version of WRTG 1150 that carries an additional hour of credit and is intended for students desiring more preparation and practice in college writing. Meets the same goals as WRTG 1150. Features one extra hour of small group work out of class. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.
Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication
MAPS Course: English

WRTG 1150 (3) First-Year Writing and Rhetoric

Rhetorically informed introduction to college writing. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication
MAPS Course: English

WRTG 1250 (3) Advanced First-Year Writing and Rhetoric

Advanced version of WRTG 1150 intended for more experienced writers, this course meets the same goals as WRTG 1150 but at a more challenging level. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication
MAPS Course: English

WRTG 1840 (1-3) Independent Study in Writing

Repeatable: Repeatable for up to 8.00 total credit hours.

WRTG 2020 (3) Introduction to Creative Nonfiction

Explores from both the reader's and writer's perspectives the forms of creative nonfiction, including personal essay and memoir. Students will read and write extensively within this genre, develop skill in revision and peer critique and learn how to submit work for publication. Does not fulfill core requirements. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

WRTG 2090 (3) Electives in Writing

Explores a variety of academic and professional writing genres, ranging from research to technical writing, in intensive workshops. Students read and write extensively across genres. Check with program for semester offerings. Designed for self-motivated students in all majors. Does not fulfill core requirements. Department enforced prereq., WRTG 1150 or equivalent (completion of lower-division writing requirement)

Repeatable: Repeatable for up to 6.00 total credit hours.

WRTG 3007 (3) Writing in the Visual Arts

Enables students in the arts to improve their writing skills through organization, presentation, critique and revision. Writing assignments include formal writing (analysis and argument), informal writing and grant proposals. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

Requisites: Restricted to students with 57-180 credits (Junior or Senior) AAAS or C-FILM or FILM or FMST or AASA or AASF or THTR or TBFA or DNCE or DBFA or AMST or ARCH or ATLS or BASA or CLAS or DSGN or ETHN or JADV or JAST or MDST or RLST or TMEN majors only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3020 (3) Topics in Writing

Through sustained inquiry into a selected topic or issue, students will practice advanced forms of academic writing. Emphasizes analysis, criticism and argument. Taught as a writing workshop, places a premium on substantive, thoughtful revision. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Arts and Sciences (ARSCU) or College of Media, Communication and Information (CMCIU) or Business (BUSNU) students only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3030 (3) Writing on Science and Society

Through selected reading and writing assignments, students consider ethical and social ramifications of science policy and practice. Focuses on critical thinking, analytical writing, and oral presentation. Taught as a writing workshop, the course addresses communication with professional and non-technical audiences.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits Engineering, MCDB, EBIO, GEOL, ASTR, IPHY, PHYS, ENVS, MATH, ECON, BCHM, CHEM, PSYC, NRSC, or CSCI majors only.

Additional Information: GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

WRTG 3035 (3) Technical Communication and Design

Rhetorically informed introduction to technical writing that hones communication skills in the context of technical design activities. Treats design as a collaborative, user-oriented, problem-based activity, and technical communication as a rhetorically informed and persuasive design art. Taught as a writing workshop emphasizing critical thinking, revision, and oral presentation skills. Focuses on client-driven design projects and effective communication with multiple stakeholders.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering, College of Media, Comm Info, MCDB, EBIO, GEOL, ASTR, IPHY, ENVS, MATH, ECON, BCHM, CHEM, PHYS, ENVD, PLAN, DSGN, ARCH, NRSC, or CSCI majors only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3040 (3) Writing on Business and Society

Through selected reading and writing assignments, students examine ethical and social issues in the context of business decision-making processes. Focuses on critical thinking, analytical writing and oral presentation. Taught as a writing workshop, the course emphasizes effective communication with professional and non-technical audiences. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Leeds School of Business (BUSN), Economics (ECON), International Affairs (IAFS) or Spanish (SPPR) majors only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3090 (1-3) Open Topics in Writing: Advanced

Advanced topics course providing intensive, specialized writing instruction in selected topics. Check with the program for semester offerings. Does not fulfill core requirements. Department enforced prerequisite: WRTG 3007 or WRTG 3020 WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

WRTG 3840 (1-3) Independent Study

Department enforced prerequisite: WRTG 3007 or WRTG 3020 or WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Business

The new innovation economy requires—and rewards—richer knowledge, sharper skills and a global mindset. Ultimately, the edge belongs to those who are principled leaders who bring inspiration and purpose to their work and in this way drive value for society.

Within this climate, the Leeds School of Business offers an innovative agenda designed to leverage our unique assets: the intellectual capital of Leeds faculty, our innovative and best-in-class curriculum, our focus on the “whole student” experience, our strong network of alumni and industry partners and our firm commitment to student support.

Accredited by the Association to Advance Collegiate Schools of Business (AACSB-International), Leeds awards four types of degrees: Bachelor of Science (BS), Master of Science (MS), Master of Business Administration (MBA) and Doctor of Philosophy (PhD). Students can specialize in accounting, finance, management and entrepreneurship and marketing. Leeds further offers certificates in a variety of areas to provide opportunities for students to explore additional areas of interest and distinction.

World-class faculty provide the foundation for breakthrough thinking—creating knowledge from research, disseminating knowledge through teaching and applying knowledge in collaboration with the business community. Faculty discoveries are frequently published in prestigious academic journals and discussed in media outlets such as the *Wall St. Journal*, the *New York Times*, CNBC and more. The cutting-edge research we produce enhances the school's reputation for innovation.

From orientation to graduation, Leeds faculty and staff guide students to discover and optimize their potential. Through an array of targeted services, students create an individualized journey that maximizes the impact of their experience and leads to future opportunities. Ethics and social responsibility are hallmarks of a Leeds education, and the school's commitment to professional development is unrivaled.

Leeds alumni and industry partners collaborate to offer a meaningful level of engagement with students and faculty. Alumni provide the support and resources that ensure graduates are poised for maximum impact. Corporate partners infuse relevance to Leeds' curriculum innovation, supporting new programs and providing the school access to professional talent. Both communities are the backbone of one of the largest mentoring programs in the world.

Leeds joins the University of Colorado and the Boulder community to generate extraordinary opportunities for students. Cross-campus collaborations with fields like engineering and science link Leeds faculty and students with more resources to put innovation into action. Our location in Boulder provides inspiration with its physical beauty as well as the intellectual energy of a thriving start-up community and high concentrations of advanced technology and socially responsible industries.

Together, these assets make Leeds uniquely qualified to deliver on our mission of educating principled, innovative leaders who drive value.

Graduation Recognition Ceremony

Every December and May, the Office of the Dean and the Leeds Business Student Government sponsor a recognition ceremony honoring the graduating class, in addition to the university-wide commencement. Graduates and their families are invited to attend.

Facilities & Research

The Leeds School of Business houses resources for the specific needs of business students. The facilities include:

- the Burridge Center for Securities Analysis and Valuation
- the Business Research Division
- Career Development
- the Center for Education on Social Responsibility
- the Center for Research on Consumer Financial Decision Making
- the MBA Business Center
- the Office of Diversity Affairs
- the Real Estate Center
- the Robert H. and Beverly A. Deming Center for Entrepreneurship
- smart classrooms
- student lounges
- Undergraduate Student Services
- William M. White Business Library and Information Commons

The William M. White Business Library and Information Commons

The White Business Library (<http://www.colorado.edu/libraries/libraries/william-m-white-business-library>) and Information Commons provide students with a wealth of information pertaining to the business world. Students have access to the business and other libraries via the university libraries online catalog. Many databases are accessible through the wireless network and off campus. These databases, both CD- and web-based, contain a myriad of full-text magazines and journals; business periodical indexes; corporate annual, 10-K and proxy reports of all the public companies in the United States; short profiles of both American and international companies; demographic and business statistics; industry and market information; and investment reports written by Wall Street analysts. Over 50 computers provide access to the databases and the internet, and technology-outfitted team rooms are available for group study. Knowledgeable librarians are always available to help navigate the search for information. The Information Commons is open 24 hours, seven days per week and contains 30 of the 50 computers with a full suite of software. These are accessible to students, faculty and staff of the university. In addition, Leeds has 25 technology equipped team rooms. These rooms support group study and project work, and are available for reservation through University of Colorado Scheduling (<https://vems1.colorado.edu>).

The White Business Library is part of the University of Colorado library system, which includes more than two million volumes, more than five million microforms, and more than 24,000 periodicals and serials. The system is also a full depository for United States government, international and state documents.

All classrooms in the Leeds School of Business are equipped up to campus "smart" classroom technology standards. Technologies in a typical Leeds classroom include: a desktop computer loaded with Microsoft Office Suite applications, video projection system, ceiling speakers for audio, DVD/VCR, iClicker base station, campus cable and

both wired and wireless Internet connections. All classrooms have the flexibility to support a personal laptop with connectivity in place to integrate with the video projection and sound system.

Business Research Division

Established in 1915, the Business Research Division is one of the earliest organized state service-oriented bureaus in the country.

The Business Research Division conducts business, economic and market research that contributes to the efficient use of Colorado's resources and increases interest in and awareness of the Leeds School of Business. It also is the umbrella organization for the Rocky Mountain Trade Adjustment Assistance (TAA) Center (RMTAAC). Through its annual Colorado Business Economic Outlook Forum, held in December, the division has established a base of knowledge that adds value to its work in other areas. In addition to providing businesses, government and nonprofits with information to help them make better-informed business and policy decisions, the division specializes in economic and fiscal analysis, market research and custom research projects. It also prepares a Colorado leading economic indicator series, the *Leeds Business Confidence Index*. Research results are distributed through presentations and reports; a quarterly newsletter, the *Colorado Business Review*; and the division's website.

Funding for center activities comes from the Leeds School of Business, the university, state agencies, the federal government, state and local business firms and from the sale of research products and services.

RMTAAC is one of 11 centers across the nation funded by the U.S. Department of Commerce to manage the Trade Adjustment Assistance for Firms Program, which helps import-impacted U.S. firms develop and implement business recovery strategies to strengthen their competitiveness in the global marketplace. The TAA for Firms Program is a cost-sharing federal grant program that pays a portion of professional consultant expenses or industry-specific expert services for projects that improve a firm's competitiveness, thereby increasing sales and creating U.S. jobs. Benefits of the program include up to \$75,000 in grant funds and 50/50 cost sharing for strategic projects.

Academic Centers

In addition to the Business Research Division, the school has five centers linking academic programs and the business community—the endowed Robert H. and Beverly A. Deming Center for Entrepreneurship, the Center for Real Estate, the Burridge Center for Securities and Valuation, the Center for Education on Social Responsibility (CESR) and the Center for Business Integration.

The Robert H. and Beverly A. Deming Center for Entrepreneurship

As part of the Leeds School of Business, the Deming Center for Entrepreneurship's mission is to inspire and empower students, community, alumni, faculty and staff through entrepreneurship education and partnership with the community. The Deming Center does this in part by educating, engaging and partnering and focusing on student experience.

Cutting-edge Curriculum. Our progressive curriculum and interdisciplinary programs include:

- courses in entrepreneurial finance, marketing and business planning
- interdisciplinary programs in engineering, business, law and environmental studies

- undergraduate business minor with a Certificate of Entrepreneurship for students across campus
- undergraduate Certificate of Entrepreneurship for Leeds students
- MBA concentration in entrepreneurship
- world renowned PhD program in entrepreneurship

The Deming Center supports the entrepreneurial curriculum and advances the Leeds School's leadership agenda through our collaborative initiatives across campus and in the business community in these key areas:

- **Education.** Our entrepreneurship students have access to a world class entrepreneurship faculty. The faculty are involved in collecting, curating and making available the latest research and thinking on entrepreneurship in the world. These faculty are inspiring and directing new research and thought leadership in entrepreneurship and constantly working with thought leaders to develop and stay ahead of the latest trends and tools for entrepreneurship education.
- **Real World Experience.** Our entrepreneurship students are challenged to turn accepted thinking on its head—in the classroom, in real-world industry projects, and by the business innovators serving as student mentors and advisors. The center helps connect students with projects, advisors and internships that challenge them to use their new skills creatively.
- **Student Experience.** Staff and faculty at Deming are focused on delivering an outstanding student experience. Deming promotes the development of entrepreneurial thinkers and doers. Entrepreneurial thinkers and doers are optimistic, resilient, resourceful, persistent, calculated risk-takers, efficient, creative problem solvers and effective workers. These are teachable skills any student is capable of learning.
- **The Community.** Boulder is consistently named one of the best places in the country to launch a startup. The center connects students to industry leaders via the Deming Network—an active group of world-class entrepreneurs and innovators who are accessible and hands-on. CU-Boulder is also a top research university. Across campus, the Deming Center helps students access opportunities in technology transfer and the engineering, law, biofrontiers and environmental science programs

Real Estate Center

The Real Estate Center, founded in 1995, is supported by an industry council with the goal of advancing academic excellence in real estate education and scholarship. The center oversees the school's real estate teaching programs and advises the faculty in designing an integrated curriculum at both the graduate and undergraduate levels. Course work is drawn from the law school, the colleges of architecture and engineering, construction management and others.

The center creates real-world experiences for students by providing project course work and being a resource for securing internships, mentors and jobs. It also provides support for faculty teaching and research activities in real estate and, through the Real Estate Foundation, assists the university with its real estate portfolio.

Burridge Center for Securities Analysis and Valuation

The Burridge Center for Securities Analysis and Valuation is dedicated to encouraging and supporting the creation and dissemination of new knowledge about the world financial markets with an emphasis on the U.S. financial markets by:

- facilitating the exchange of ideas and knowledge between professional investment managers, finance scholars, policy makers and the investing public;
- identifying critical research issues in the theory and practice of security analysis and valuation; and
- encouraging and supporting rigorous qualitative and quantitative research on topics relevant and useful to money managers, valuation experts and finance academics.

Center for Education on Social Responsibility (CESR)

CESR's goal is to help students become outstanding business leaders of tomorrow by preparing them to meet the ethical challenges posed by a highly competitive, globally-connected business world. Accordingly, CESR oversees the infusion of values and social responsibility discussions throughout the undergraduate and graduate curricula at the Leeds School of Business. As part of the central mission at Leeds, CESR creates pedagogies that are national models and plays a leadership role carrying out the school's commitment to developing leaders of conscience. Although the Center's primary focus is on excellence in curriculum development and delivery, CESR also undertakes a broad spectrum of initiatives including a certificate program, student organizations, conferences and other extracurricular offerings as well as providing funding and administrative support for faculty research.

Courses

CESR is directly responsible for course development, staffing and coordination of the Business requisite introduction course World of Business, and collaborates on the design and delivery of the requisite 3000-level course Business Law, Ethics & Social Responsibility. CESR also offers leading edge electives such as CESR 4000, CESR 4005, CESR 4827/ACCT 4827, CESR 4828/MGMT 4828 and the Global Seminar *Social Entrepreneurship & Innovation* in Panama.

Certificate and Portfolio

CESR offers specialized recognition for students at the undergraduate and graduate levels. Undergraduates wishing to focus on CESR-related topics may earn the Certificate in Socially Responsible Enterprise (SRE). At the MBA level, CESR has formalized a Sustainability Portfolio of courses, including the MBA requisite Socially Responsible Enterprise course, and electives such as MBAX 6570 and MBAX 6140.

CESR Co-Curricular Activities

- **CESR Stampede at Leeds: A Week of Driving Values in Business.** This weeklong event showcases the values-driven and innovative curriculum developed by the CESR that is shaping tomorrow's business leaders. Through class visits, expert panels and lectures student competitions and showcases, attendees will explore their own values and network with like-minded professionals about applying positive values in a business setting. Stampede Week also includes the fourth annual Conscious Capitalism Conference, a CESR flagship event.

CESR routinely hosts events aimed at our students, our local business community and educators and industry leaders throughout the academic year. Guest speakers change each semester, but recurring events are included here:

- **CESR Business Ethics Case Competition (BECC).** The CESR BECC is an interactive way to deepen the Leeds undergraduate students' understanding of the importance of creating ethical as well as profitable business cultures. Teams are provided with a business case in the weeks leading up to the competition which they will have to analyze, create recommendations for course of action and present

their solutions to a panel of professional judges. Cash prizes are awarded to the top three teams.

- **Conscious Capitalism Conference.** An annual conference hosted by CESR featuring innovative executives and entrepreneurs who have used the traditional tools of capitalism to serve social needs.
- **Student Center for Social Entrepreneurship.** CESR provides faculty sponsorship for SCSE, the student branch of Social Entrepreneurship for Equitable Development, an interdisciplinary, inter-generational campus group that is involved in researching, teaching and generating student involvement in the areas of social entrepreneurship and sustainable community development.
- **Net Impact Club.** CESR is home to a graduate chapter of Net Impact, an international non-profit organization whose mission is to use the power of business to create a more socially and environmentally sustainable world.
- **New Venture Challenge Social Impact Track.** CESR developed and continues to support the Social Impact Track of the **CU New Venture Challenge**, a campus-wide initiative connecting students and faculty with teammates in a broad range of disciplines and with mentors from the business community. The goal is to provide knowledge and experience making entrepreneurship accessible to anyone on the CU-Boulder campus with the enthusiasm and creativity required to start a new business.

Career Opportunities

Leeds School of Business graduates are prepared for positions in the following fields:

- Accounting—public, private, nonprofit and governmental
- Banking and other financial institutions
- Consulting
- Corporate financial management
- Entrepreneurship and small business management
- Financial analysis
- Human resources management
- Information systems
- International business
- Investment management
- Management consulting and organization management
- Marketing and sales management
- Nonprofit management
- Operations management
- Real estate
- Retailing
- Taxation
- Technology management
- Transportation
- Venture capital

Other graduates hold positions in fields as diverse as business journalism, public relations, city planning, chamber of commerce and trade association management, college administration and government. The entrepreneurial area of application prepares students to start their own business ventures to take positions in emerging growth companies and the venture capital industry.

Programs & Leadership Professional Mentorship Program

The Professional Mentorship Program (PMP) is a unique program that offers one-on-one professional mentoring to current undergraduate students. The program's mission is to enhance business education at the Leeds School by offering hands-on learning, professional skills development, leadership opportunities and a sense of connection and community among current students, Leeds alumni and corporate partners. PMP mentors prepare and inspire our students to become the next generation of strong business leaders.

This two-year program matches students with executives or high-level business professionals who align by industry, geographic location or functional area. To ensure a quality experience for both students and mentors, the PMP provides workshops, training and additional support for participants throughout the program.

Program Benefits

Through this program, students gain an additional level of advising and career counseling from a business professional. Through the mentoring relationships, students can explore choice of majors, potential for graduate school, work-life balance and effective networking and job search strategies.

Other potential benefits of being involved in the PMP include:

- Advice and assistance on academic questions, career options, life beyond college and more
- Access to the PMP network and networking opportunities and the opportunity to start building the student's own professional network
- Opportunities to practice and strengthen professional communication and presentation skills
- Help in defining personal and professional goals, and the strategies to achieve them
- Unique internship and job opportunities
- Development of a life-long friend and connection in the business world

Contact Information

Website: leedsmentoring.colorado.edu/about (<http://leedsmentoring.colorado.edu/about>)

Email: leedspmp@colorado.edu

Office: Koelbel S220C

Phone: **303-492-5881**

Study Abroad

Study abroad programs are available for students interested in international business or in cultural experiences abroad. The college-sponsored London Seminar in International Finance and Business is a five-week-long program held each summer in the financial district of London and is open to juniors, seniors and graduate students.

Student Organizations

Listed below are undergraduate organizations that promote professional interests and provide recognition of scholastic attainment:

- Alpha Kappa Psi
- Athletic Business Club
- CU Fashion Club
- Beta Alpha Psi

- Collegiate DECA
- CU Energy Club
- CU Finance Club
- CU American Marketing Association
- CU Investment Club
- CU Society for Human Resources Management
- Delta Sigma Pi
- International Business Club
- Leeds Ambassadors
- Leeds Association of Information Systems
- Leeds Council (Undergraduate Student Government)
- Multicultural Business Student Alliance
- Music Industry Club
- Real Estate Club
- Women in Business Club

Leeds School of Business Student Government

Leeds Council is the governing body of the Leeds School of Business that strives to serve, support and represent the student body. The council also works to make Leeds a better business school through social, academic and professional programming. The council is made up of five primary committees and an executive board that control a significant portion of the Leeds student fees.

Two members of Leeds Council also serve as representatives on University of Colorado Student Government (CUSG) to voice the interests of business students at the main campus.

Career Development

The Leeds Career Development Office is the hub for undergraduate professional development. We work with each student to create a four-year career development plan that will allow them to develop the professional competencies and business connections needed to pursue their personal and career goals. Leeds students have access to unique, business-focused resources including:

Career Readiness Programs

All Leeds students are assigned a career advisor by their area of emphasis. Advisors work with each student to create a four-year career development plan that allows them to develop the professional competencies and business connections needed to pursue their goals. Key services that support career readiness include:

- One-on-One Career Coaching Sessions
- Skill Development Workshops
- Personal- and Career-Assessments
- Mock Interviews

Employer Connections

The Leeds School has created strong partnerships with over 2,000 companies from diverse industries and locations. Our office connects students of all interests with the resources, organizations and people necessary to facilitate career success, including:

- On Campus Interviews
- Employer Panels by Industry or Topic
- Employer Information Session and Recruitment Days
- Leeds-Specific Career Fairs

- Leeds Signature Events: CoLab and Sophomore Professionalism Summit

Industry Experiences

At Leeds, students are encouraged to explore career opportunities in business through hands-on learning via internships and Career Treks.

- **Internships:** Dedicated support includes an internship advisor, internship-focused workshops and networking events.
- **Career Treks:** Visits focused on an industry, functional area or location with in-depth opportunities for job search and connections. Previous visits have included Boulder, Denver, Chicago, Houston, Los Angeles, New York, Salt Lake City and San Francisco.
- **Professionalism Assignments:** The World of Business and Sophomore year provide all Leeds 1st and 2nd-year students with a strong foundation to pursue their career interests and goals.

Mentoring

The integration of multiple mentoring programs throughout the four-year experience is a unique feature of the Leeds education, providing students with individual connections and personalized support. Over 1,500 undergraduates and more than 900 professional mentors participate in mentoring through these programs:

- **CoLab: Essentials of Collaboration and Innovation in Business:** Full-day outdoor orientation experience introducing first-year students to key business concepts and corporate mentors.
- **Peer2Peer:** Connects new Leeds students with trained student mentors to help students build a strong foundation and sense of belonging at Leeds.
- **Young Alumni Mentors Program:** Partners sophomores with recent Leeds graduates to provide major and career exploration, academic preparation and professional skills development.
- **Professional Mentorship Program:** Pairs juniors and seniors with experienced business professionals providing opportunities to develop and practice critical professional skills and build their professional network.

Contact Information

Website: www.colorado.edu/business/career (<http://www.colorado.edu/business/career>)

Email: leedscareer@colorado.edu

Office: KOB L S210

Phone: 303-492-1808

Policies & Requirements

Academic Excellence

Honors

In recognition of high scholastic achievement, upon recommendation of the faculty, the designation "With High Distinction" or "With Distinction" will be awarded at graduation. To qualify for the "With High Distinction" designation, the student's cumulative University of Colorado GPA must be at least 3.90. For the "With Distinction" designation, the student's cumulative GPA must be at least 3.75 but less than 3.90. In addition, for these designations, at least 60 credit hours must have been earned at CU Boulder.

In addition to the distinction of honors, Leeds School of Business students also may participate in the Latin honors granted by the College

of Arts and Sciences. Qualified students are encouraged to participate in this program, which coordinates the offering of a variety of honors seminars as well as the granting of Latin honors (cum laude, magna cum laude, summa cum laude) at graduation. Granting of these honors is determined by the Honors Council based on several criteria, including the quality of original scholarly work (generally reported in the form of a thesis). Latin honors are not conferred on a graduate entering in the summer of 1995 and thereafter simply by virtue of high grades. Interested students should consult the Honors Program listing in the College of Arts and Sciences section or contact the Honors Program in Norlin Library.

Dean's List

Students in the Leeds School of Business who have completed at least 12 credit hours of CU Boulder course work for a letter grade in any single semester with a term GPA of 3.600 or better are included on the dean's list and receive a notation on their transcript.

Beta Gamma Sigma

Membership in Beta Gamma Sigma is an honor that must be earned through outstanding scholastic achievement. Such membership is the highest scholastic honor that a student in a school of business or management can attain.

To be eligible for Beta Gamma Sigma membership, students must rank in the top 10 percent of their junior class, the top 10 percent of their senior class or be among the top 20 percent of those students receiving master's degrees. Also, students completing all requirements for the doctoral degree conferred by a business school are eligible for Beta Gamma Sigma. It should be noted that Beta Gamma Sigma chapters may be chartered only in those schools of business and management accredited by AACSB, the International Association for Management Education.

Scholarships

Each year the college awards a number of divisional and general scholarships. Business scholarships are for students who have completed business course work at the university. The amount and number of the awards vary each year.

Academic Standards

Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery or falsification of official records and similar acts or the attempt to engage in such acts are grounds for suspension or expulsion from the university. Reported acts of academic dishonesty must be referred to the Honor Council.

Students are advised that plagiarism consists of any act involving the offering of someone else's work as the student's own. It is recommended that students consult with instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses. Official college procedures concerning academic ethics are maintained in the Office of Undergraduate Studies.

Standards of Performance

Students are held to basic standards of performance with respect to attendance, active participation in course work, promptness of assignments, correct English usage both in writing and in speech, accuracy in calculations and general quality of scholastic workmanship.

In general, examinations are required in all courses and for all students, including seniors.

Good Academic Standing

To be in good standing, you must have an overall grade point average of C (2.00) or better for all course work taken, and a 2.00 or better for all business courses taken. Students must earn a passing grade for all required courses. This requirement applies to work taken at all university campuses.

Any student earning all or nearly all failing grades, or no academic credit for a semester will not be permitted to register without the dean's approval.

Official double-degree students must maintain required academic standards for the Leeds School as well as their other college.

When semester grades become available, students below the acceptable standard will be placed on probation or suspension. Students are responsible for being aware of their academic status at all times, and late grades and/or late notification do not waive this responsibility.

Academic Alert (First-Year Students Only)

First-semester freshmen with a cumulative grade point average or business grade point average below 2.00 at the end of their first semester will be placed on academic alert. If you are placed on academic alert, you are in good academic standing, but you must meet with your academic advisor to discuss your performance and establish a customized academic recovery contract. Students placed on a academic alert are given one semester to improve their academic performance. At the conclusion of your academic alert semester, your records will be reviewed.

- If both cumulative and business GPAs are 2.00 or higher, you will remain in good standing.
- If your cumulative and/or business GPA is still below 2.00 but you met the terms of your academic recovery contract, you will be placed on probation and given one academic recovery semester (see Probation/Academic Recovery).
- If your cumulative and/or business GPA is still below 2.00 and you did not meet the terms of your academic recovery contract, or you never met with your advisor to establish a contract, you will be placed on academic suspension (see Scholastic Suspension).

Probation/Academic Recovery

If your cumulative grade point average or cumulative business grade point average falls below 2.00, you will immediately be placed on probation for one semester. If you enroll in any term, excluding summers, after being placed on probation you are expected to raise your cumulative and business grade point average to at least a 2.00 or demonstrate significant progress toward improving your GPA(s).

If you do not raise your GPA(s) to 2.00 or make significant progress during your probation semester you will be placed on suspension.

Significant Progress

Significant progress is defined relative to whichever GPA is below 2.0. If the cumulative GPA is below 2.0, significant progress is defined as a term GPA of 2.5 with at least 12 credits completed toward the cumulative GPA. If the Business GPA is below 2.0, significant progress is defined as a term business GPA of 2.5 with at least 6 credits of business course work completed.

Scholastic Suspension

If your cumulative and/or business grade point average is below 2.00 after your semester of probation and you have not demonstrated significant progress (as defined above), you will be suspended. If you are suspended, you will not be able to register for University of Colorado daytime courses on any campus for one academic year OR until you raise your GPA to 2.0 or demonstrate significant progress.

You are allowed to take summer classes at any of the CU campuses while on suspension.

If you are suspended, you may choose from the following options.

Suspension Option 1: Clear GPA

1. Students may take Continuing Education Independent Learning courses, and/or Boulder Evening credit classes, and apply for readmission when they have cleared their grade deficiency or when they have demonstrated significant progress.
 - If a student is readmitted based on significant progress, they will be readmitted on probation and will be subject to Leeds' probation rules (see Probation).
 - You must maintain a 2.50 term GPA each semester that you enroll in Continuing Education courses. If you do not earn a 2.50 GPA in Continuing Education Courses, you will be suspended from Continuing Education and will only be allowed to enroll in CU Boulder courses during the summer term.
2. Students may choose to attend another educational institution and apply for readmission when, and only when, they have overcome their grade deficiencies by means of a GPA, which is arrived at by averaging the grades from CU with the grades from the other institution. These transfer grades are used only for the purpose of readmission and do not remain in the University of Colorado grade point average. If students choose to attend another institution, they must have their proposed course work preapproved by the Office of Undergraduate Student Services in the Leeds School of Business.
 - If students choose this option and are readmitted based on a virtual GPA, they will be readmitted on probation and will be subject to Leeds' probation rules (see Probation).
3. Students may choose a combination of 1 and 2.

Suspension Option 2: Do not take classes for one year

If students have been under suspension for one calendar year and did not elect Option 1, they may apply for readmission. Students will have two semesters to raise their cumulative or business grade point average to at least a 2.00. If their GPA falls after the first semester, they will again be suspended for another academic year or until their grade deficiency has been made up.

Readmission

When students make up their grade deficiency (Option 1) or have not taken classes for one year (Option 2) and desire to be readmitted, they must request readmission in writing by contacting:

Office of Undergraduate Student Services
UCB 419
Boulder, CO 80309
Email: leedsug@colorado.edu

After doing so, students may need to reapply by submitting an application through the Office of Admissions. For more information, call 303-492-6515.

Suspended Leeds School students who transfer into another school or college of the university will not be eligible to register for business courses and will be subject to administrative drops.

Credit and Enrollment

All students are responsible for knowing and following the provisions set forth below. Any questions concerning these provisions should be directed to the college. The college cannot assume responsibility for problems resulting from a student's failure to follow the policies stated here or from incorrect advice given by those outside the Office of Undergraduate Services. Similarly, students are responsible for all deadlines, rules and regulations stated in the General Information section of this catalog. All rules and regulations are subject to change. Any questions should be directed to the Leeds School of Business, Office of Undergraduate Services, KOB L S220, 303-492-6515.

Admission to the Business Program

Prospective freshman students are encouraged to complete strong academic programs in high school. A minimum of four academic units should be completed each year with special emphasis given to writing, mathematics and science skills. For a detailed explanation of the high school preparation desired, see Undergraduate Admission in the General Information section.

Transfer students are expected to demonstrate proficiency in economics, writing and mathematics. Prospective transfer students should complete courses equivalent to those taken by University of Colorado business freshmen and sophomores.

Residency Requirement

Complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus. Of these 45 credits, a minimum of 30 credits must be business courses completed as a matriculated student in Leeds.

Intrauniversity Transfer

An undergraduate student who is enrolled on the Boulder campus and wishes to transfer to the Leeds School of Business may submit a completed application for the fall or spring semester. A cumulative university GPA of 3.00 and a cumulative GPA of 2.00 in business courses is necessary to be considered for admission. In addition, students must have 24 completed credit hours, 12 of which must be graded work at CU-Boulder; 4 credit hours of MATH 1112; and microeconomics and macroeconomics. Students must earn a grade of B- or better in ECON and MATH to be considered for admission. Intrauniversity transfer students must take a minimum of 30 credit hours of business courses, including their area of emphasis, in residence after admission to the college. Applications are accepted year round and will be reviewed once a month. However, the deadlines for admission prior to the registration period are October 1 for spring and March 1 for fall. Leeds can't guarantee the usual selection of courses for those who submit applications after the deadline.

In order to apply to the Leeds School of Business, students must complete a mandatory online IUT presentation and quiz.

Registration Stops

A service indicator stop will be placed on students' records when they have earned 45 credit hours, if they have not yet declared their area of emphasis. All first and second year students will also have a service indicator and be required to attend an advising meeting before registration for the next semester.

Registration for Business Courses

Business students may register only for those courses for which they have the stated prerequisites.

Administrative Drops

Instructors may recommend to the Office of Undergraduate Services that students who fail to meet expected course attendance or prerequisites be dropped from their courses at any time during the semester.

Attendance Regulations

Classroom attendance is left to the discretion of the instructor. Students are responsible for understanding each instructor's policy on attendance.

Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Failure to attend regularly may result in receipt of an *F* in a course. Students who, for illness or other legitimate reasons, miss a final examination must notify the instructor no later than the end of the day on which the examination is given. Failure to do so may result in receipt of an *F* in the course.

Concurrent Registration

Concurrent registration is for graduating seniors who must be enrolled on two campuses of the University of Colorado at the same time in order to fulfill graduation requirements.

Students enrolled in the Leeds School of Business may exercise the concurrent registration option if they are in their graduating semester or are two semesters from graduating and cannot obtain a course necessary to complete a prerequisite sequence. The course must be required for graduation and must not be offered on the Boulder campus, or the course must conflict with another required course in which the student is enrolled. Students from other colleges and schools who wish to take business courses must have the approval of their own college or school before submitting the concurrent registration form.

Scholastic Load

The normal scholastic load of an undergraduate student in the college is 15 credit hours, with a maximum of 21 credit hours during the fall and spring semesters. A maximum of 3 credit hours may be taken during Maymester. A maximum of 6 credit hours may be taken during a five-week summer term, with no more than 12 credit hours total during the 10-week summer session.

Credit Policies

To receive credit, all courses must be listed on the student's official transcript by the Office of the Registrar. Credit is then evaluated by the Leeds School of Business to determine degree acceptability.

Cooperative Education Credit

No credit is given for work experience or cooperative education programs.

Correspondence Credit

All correspondence courses must have prior approval and be evaluated to determine their acceptability.

Advanced Placement (College Board)

For students who earn scores of 3, 4 or 5 on Advanced Placement exams, college credit will be given where appropriate. See the General Information section for a comprehensive chart on AP credit.

College-Level Examination Program (CLEP)

College credit for approved CLEP subject examinations may be considered, providing the scores are at the 67th percentile or above.

Specific information is available in the Office of Undergraduate Student Services.

CLEP credit is only appropriate for nonbusiness requirements and nonbusiness electives. A maximum of 6 hours of credit in any one course area is allowed. CLEP may not be used in course areas where credit has already been allowed. General examinations are not acceptable. CLEP credit is not transferable.

Before a CLEP examination can be taken, students must have prior approval in writing by the Office of Undergraduate Student Services.

No Credit

Because of enrollment limitations, business classes may not be taken on a no-credit basis.

Special Sources of Credit

The college reserves the right to accept or reject all special sources of credit that do not have prior approval of the dean.

Independent Study

A maximum of 6 credit hours of independent study will be accepted as degree credit. Prior approval is required if the work is to be applied as degree credit. A maximum of 3 credit hours may be taken in any one semester.

Study Abroad Credit

Transfer credit from study abroad programs may be applied to the business degree. Students planning to attend study abroad programs must meet with an undergraduate advisor and have their course selections approved prior to leaving campus.

More specific information about these opportunities is available from the Office of International Education.

Transfer Credit

The school reserves the right to disallow any credit that it deems inappropriate degree credit.

Credits in business subjects transferred from other institutions will be limited to the number of credit hours given for equivalent work in the regular offerings of the university. Only work from regionally accredited institutions will transfer to the college. A maximum of 60 credit hours of credit may be accepted from a two-year school.

Actual equivalent courses may be substituted for required courses. Students must submit a carefully checked catalog description and course syllabus for course equivalency determination.

Business students desiring to apply course work from another institution or University of Colorado campus toward the BS degree in business administration must have prior approval of the Leeds School of Business. Only nonbusiness requirements or elective credit is acceptable in transfer from other institutions once the student has enrolled.

All courses in the area of emphasis must be taken at the University of Colorado Boulder unless written approval is given by the associate dean of undergraduate services. Transfer students must take a minimum of 30 credit hours of business courses, including the area of emphasis, in residence after admission to the college. For more information on transfer of credit policies, see Transfer of College-Level Credit in the Admission section.

Grading Policies

In addition to the campuswide grading system and *pass/fail* policy listed under Registration in the General Information section, the Leeds School of Business enforces the following policies.

Pass/Fail

Students in the Leeds School of Business may not use the pass/fail option for courses taken to fulfill General Education Core Requirements, courses used to satisfy the Minimum Academic Preparation Standards (MAPS), business core requirements, business major requirements or business electives. A grade of F when earned in a course taken pass/fail will calculate into the GPA as a failing grade. Only nonbusiness electives may be taken on a pass/fail basis. A maximum of 6 credit hours of pass/fail credit may be applied toward the BS degree in business administration. Pass/fail determination must be made by the deadline set through the Registrar's Office is irreversible. A maximum of 6 credit hours designated pass/fail may be taken in any one semester.

Failed courses may be repeated, but the F will be included in the GPA.

Incomplete Grades

The only incomplete grade given in the college is an I grade is given only when documented circumstances clearly beyond the student's control prevent the student from completing the course. Generally, students should make up the missing work and not retake the entire course. Students should not register for the class a second time, unless directed by the instructor. All I grades must be made up within one year or the I will be changed to a grade of F.

Grade Changes

Final grades as reported by instructors are considered permanent and final. Grade changes will be considered only in cases of documented clerical errors, and must be approved by the associate dean.

Withdrawal

Students may withdraw from the university any time before the beginning of the final examination period.

Programs of Study

Business Administration

The following areas of knowledge are central to the undergraduate degree in business administration:

- knowledge of core business concepts that provides students with a comprehensive understanding of the basic functional areas of the discipline;
- knowledge in one or more of the four areas of emphasis, in which students are exposed to in-depth study that provides them with the tools necessary to solve complex business problems;
- awareness of the interrelations between academic theory and practice in order for students to be fully equipped to make effective decisions;
- strong verbal and written communication skills, proficiency in business computer applications and knowledge of international business environments;
- knowledge of mathematics sufficient to facilitate the application of quantitative principles; and

- awareness of the importance of academic fields in the area of arts and sciences, with special emphasis placed on the study of economics, political science and other related fields.

In addition, students completing a degree in business administration are expected to acquire:

- the ability to apply basic business principles to solve problems in new and recurring situations;
- the ability to conceptualize and analyze decision-making situations to facilitate solutions in an effective and timely manner; and
- the ability to effectively communicate the results of problem-solving situations, both verbally and in writing.

Having acquired these skills and knowledge, students are able to conceptualize and analyze the concept of business and problem solving as a system. They have the ability to present solutions to business problems in an understandable and useful form. Their education provides them with excellent working knowledge, not only in the field of business, but also in related academic disciplines.

The Leeds School of Business holds accreditation by the Association to Advance Collegiate Schools of Business (AACSB-International).

Advising and Records

Undergraduate business students receive academic counseling from a staff of professional advisors in the Office of Undergraduate Student Services. During the semester, advisors are available in KOBLS220, Monday–Friday, 8 a.m.–5 p.m., by appointment.

Students are expected to assume responsibility for planning their program in accordance with college rules and policies. Students are encouraged to discuss the various emphases available as well as career opportunities with the faculty of the college.

Bachelor's Degree

- Business Administration - Bachelor of Science (BS) (p. 562)

Minor

- Business - Minor (p. 567)

Certificates

- Entrepreneurial Studies - Certificate (p. 567)
- Global Business - Certificate (p. 568)
- Operations and Information Management - Certificate (p. 568)
- Quantitative Finance - Certificate (p. 143)
- Real Estate - Certificate (p. 569)
- Socially Responsible Enterprise - Certificate (p. 569)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, Heather L (https://experts.colorado.edu/display/fisid_143714)
Instructor; PhD, University of Maryland College Park Campus

Appenzeller, William
Professor Emeritus

Balkin, David B (https://experts.colorado.edu/display/fisid_105481)
Professor; PhD, University of Minnesota Twin Cities

Ballantine, John T (https://experts.colorado.edu/display/fisid_102703)
Senior Instructor; JD, University of Colorado Boulder

Bangs, F. Kendrick
Professor Emeritus

Beagle, Chauncey M.
Professor Emeritus

Bernthal, Wilmar F.
Professor Emeritus

Bhagat, Sanjai (https://experts.colorado.edu/display/fisid_100789)
Professor; PhD, University of Washington

Borum, John Owen (https://experts.colorado.edu/display/fisid_147714)
Instructor; JD, University of Colorado Boulder

Boss, Russel Wayne (https://experts.colorado.edu/display/fisid_105260)
Professor; PhD, University of Georgia

Buchman, Thomas A.
Professor Emeritus; PhD, University of Illinois

Campbell, Margaret Catherine (https://experts.colorado.edu/display/fisid_118141)
Professor; PhD, Stanford University

Cateora, Phillip R.
Professor Emeritus

Chen, Zeyun (https://experts.colorado.edu/display/fisid_147332)
Assistant Professor; PhD, University of Houston-Downtown

Christoff, Lorna Colleen (https://experts.colorado.edu/display/fisid_146614)
Instructor

Cookson, John Anthony (https://experts.colorado.edu/display/fisid_152874)
Assistant Professor; PhD, University of Chicago

Correll, Mark R.
Professor Emeritus

Cropanzano, Russell Salvador (https://experts.colorado.edu/display/fisid_151710)
Professor; PhD, Purdue University

Dam, Robert Anthony (https://experts.colorado.edu/display/fisid_155860)
Assistant Professor; PhD, Northwestern University

Darnell, Jerome C.
Professor Emeritus

Davies, Shaun William (https://experts.colorado.edu/display/fisid_152995)
Assistant Professor; PhD, University of California-Los Angeles

de Langhe, Bart (https://experts.colorado.edu/display/fisid_149819)
Assistant Professor; PhD, Erasmus University (Netherlands)

Delgado, Francisco Antenor (https://experts.colorado.edu/display/fisid_109275)
Senior Instructor; PhD, University of Pennsylvania

Demaree, John D.
Professor Emeritus

Donchez, Robert M (https://experts.colorado.edu/display/fisid_101267)
Senior Instructor; MBA, Fordham University

Engel, Steven
Professor Emeritus

Ertimur, Yonca (https://experts.colorado.edu/display/fisid_151585)
Associate ProfessorProfessor; PhD, New York University

Fernbach, Philip M (https://experts.colorado.edu/display/fisid_149786)
Assistant Professor; PhD, Brown University

Frederick, David M (https://experts.colorado.edu/display/fisid_101543)
Associate Professor; PhD, University of Michigan Ann Arbor

Garcia, Diego (https://experts.colorado.edu/display/fisid_156036)
Professor; PhD, University of California-Berkeley

Garnand, John J.
Professor Emeritus

Glover, Fred W.
Professor Emeritus

Goeldner, Charles R.
Professor Emeritus

Gordon, Kenneth R.
Professor Emeritus

Gross, David Michael (https://experts.colorado.edu/display/fisid_109026)
Senior Instructor; PhD, University of Colorado Boulder

Gwozdz, Ronald Scott (https://experts.colorado.edu/display/fisid_144830)
Instructor; MBA, University of Colorado Boulder

He, Chuan (https://experts.colorado.edu/display/fisid_124857)
Associate Professor; PhD, Washington University

Hekman, David R (https://experts.colorado.edu/display/fisid_151359)
Assistant ProfessorAssociate Professor; PhD, University of Washington

Jackson, Betty R.
Professor Emeritus

Jagolinzer, Alan David (https://experts.colorado.edu/display/fisid_148591)
Associate Professor; PhD, Pennsylvania State University

Jedamus, Paul E.
Professor Emeritus

Jennings, Tracy M (https://experts.colorado.edu/display/fisid_128765)
Senior InstructorInstructor

Jensen, Howard G.
Professor Emeritus

Johnson, Stefanie Kathleen (https://experts.colorado.edu/display/fisid_153813)

Assistant Professor; PhD, Rice University

Kline, Bruce Richard (https://experts.colorado.edu/display/fisid_146513)

Senior Instructor; MA, Northwestern University

Koberg, Christine S.

Professor Emeritus

Kolb, Burton A.

Professor Emeritus

Kornish, Laura Joyce (https://experts.colorado.edu/display/fisid_139966)

Associate Professor; PhD, Stanford University

Kozar, Kenneth A.

Professor Emeritus; PhD, University of Minnesota

Laguna, Manuel (https://experts.colorado.edu/display/fisid_102975)

Professor; PhD, University of Texas at Austin

Larsen, Kai Rune (https://experts.colorado.edu/display/fisid_118160)

Associate Professor; PhD, SUNY at Albany

Lawrence, Stephen R (https://experts.colorado.edu/display/fisid_102032)

Associate Professor; PhD, Carnegie Mellon University

Lazar, Joseph

Professor Emeritus

Leach, Chris (https://experts.colorado.edu/display/fisid_105152)

Professor; PhD, Cornell University

Lee, Jintae (https://experts.colorado.edu/display/fisid_115390)

Associate Professor; PhD, Massachusetts Institute of Technology

Lewis, Barry L.

Professor Emeritus

Lewis, Mary Beth (https://experts.colorado.edu/display/fisid_153829)

Senior Instructor; MBA, University of Pittsburgh Bradford Campus

Lichtenstein, Donald (https://experts.colorado.edu/display/fisid_101701)

Professor; PhD, University of South Carolina - Columbia

Lymberopoulos, John P.

Professor Emeritus

Lynch, John G. (https://experts.colorado.edu/display/fisid_147448)

Professor; PhD, University of Illinois at Chicago

Macfee, Raymond D. Jr

Professor Emeritus

Marshall, Nathan Thomas (https://experts.colorado.edu/display/fisid_156034)

Assistant Professor; PhD, Indiana University Bloomington

Matusik, Sharon Marie Frances (https://experts.colorado.edu/display/fisid_133564)

Professor; PhD, University of Washington

Mc Nown, Robert F (https://experts.colorado.edu/display/fisid_105915)

Professor; PhD, University of California-San Diego

McGraw, Albert Peter (https://experts.colorado.edu/display/fisid_133262)

Associate Professor; PhD, Ohio State University

McMahon, Kevin Christopher (https://experts.colorado.edu/display/fisid_143892)

Senior Instructor; MBA, Indiana University-Purdue Univ at Indianapolis

Meyer, G. Dale

Professor Emeritus

Milburn, Catherine Knoll (https://experts.colorado.edu/display/fisid_142214)

Senior Instructor; MS, University of Colorado Boulder

Mohr, Peter J (https://experts.colorado.edu/display/fisid_155498)

Senior Instructor; MS, Colorado State University

Montealegre, Jose Ramiro (https://experts.colorado.edu/display/fisid_100072)

Associate Professor; DBA, Harvard University

Morley, Susan (https://experts.colorado.edu/display/fisid_116716)

Senior Instructor; JD, University of Colorado Boulder

Morrison, Edward J.

Professor Emeritus

Moyen, Nathalie (https://experts.colorado.edu/display/fisid_113873)

Associate Professor; PhD, Univ of British Columbia (Canada)

Mueller, Erick Michael (https://experts.colorado.edu/display/fisid_140940)

Senior Instructor; MBA, University of Colorado Boulder

Nelson, James E.

Professor Emeritus

Nelson, Thomas Cavett (https://experts.colorado.edu/display/fisid_116011)

Senior Instructor; PhD, University of Colorado Boulder

Oest, Donald G (https://experts.colorado.edu/display/fisid_146623)

Instructor; MBA, Fairleigh Dickinson University

Palmer, Michael

Professor Emeritus

Papuzza, Antonio (https://experts.colorado.edu/display/fisid_145295)

Instructor; PhD, Univ of Florence (Italy)

Parkin, Don

Professor Emeritus

Payne, David Sanders (https://experts.colorado.edu/display/fisid_143848)

Instructor

Reinholtz, Nicholas S (https://experts.colorado.edu/display/fisid_155180)

Assistant Professor; PhD, Columbia University In the City of New York

Reuer, Jeffrey J (https://experts.colorado.edu/display/fisid_155768)

Professor; PhD, Purdue University

Reznicek, Birdie C (https://experts.colorado.edu/display/fisid_149091)

Instructor

Richey, Clyde W.
Professor Emeritus

Ringgenberg, Ralph G.
Professor Emeritus

Rock, Steven Karl (https://experts.colorado.edu/display/fisid_113689)
Associate Professor; PhD, Pennsylvania State University

Rogers, Jonathan L (https://experts.colorado.edu/display/fisid_153009)
Associate Professor; PhD, University of Pennsylvania

Rosse, Joseph G (https://experts.colorado.edu/display/fisid_105706)
Professor; PhD, University of Illinois at Urbana-Champaign

Rush, David F.
Professor Emeritus

Schattke, Rudolph
Professor Emeritus

Schaub, Kevin D. (https://experts.colorado.edu/display/fisid_144142)
Instructor; MBA, University of Colorado Boulder

Sears, Curtis R (https://experts.colorado.edu/display/fisid_145482)
Senior Instructor/Instructor; JD, University of Colorado Boulder

Selto, Frank
Professor Emeritus; PhD, University of Washington

Seward, Lori Elizabeth (https://experts.colorado.edu/display/fisid_113934)
Senior Instructor; PhD, Virginia Polytechnic Institute and State Univ

Sorenson, Ralph Z.
Professor Emeritus

Spinetto, Richard D.
Professor Emeritus

Stanton, William J.
Professor Emeritus

Stapp, Elizabeth Cole (https://experts.colorado.edu/display/fisid_149889)
Instructor; JD, Boston University

Stephenson, Craig A (https://experts.colorado.edu/display/fisid_144851)
Senior Instructor; PhD, University of Arizona

Stockton, Keith Michael (https://experts.colorado.edu/display/fisid_143887)
Instructor; PhD, University of Colorado Boulder

Stutzer, Michael J. (https://experts.colorado.edu/display/fisid_126711)
Professor; PhD, University of Minnesota Twin Cities

Sun, Yacheng (https://experts.colorado.edu/display/fisid_145680)
Assistant Professor; PhD, Indiana University Bloomington

Taylor, Robert H.
Professor Emeritus

Thibodeau, Thomas G (https://experts.colorado.edu/display/fisid_134750)
Professor; PhD, SUNY at Stony Brook

Tice, Frances Mei-Lin Siu (https://experts.colorado.edu/display/fisid_156018)
Assistant Professor; PhD, Texas AM University

Tong, Wenfeng (https://experts.colorado.edu/display/fisid_144520)
Associate Professor; PhD, Ohio State University

Tracy, John A.
Professor Emeritus

Van Wesep, Edward D (https://experts.colorado.edu/display/fisid_154573)
Associate Professor; PhD, Stanford University

Vossen, Thomas Wilhelmus (https://experts.colorado.edu/display/fisid_126642)
Associate Professor; PhD, University of Maryland College Park Campus

Waddell, Jay L (https://experts.colorado.edu/display/fisid_151520)
Instructor; MS, University of Wisconsin-Madison

Wang, Yanwen (https://experts.colorado.edu/display/fisid_154266)
Assistant Professor; PhD, Emory University

Waters, Brian Todd (https://experts.colorado.edu/display/fisid_155846)
Assistant Professor; PhD, University of California-Los Angeles

Wenger, Paula (https://experts.colorado.edu/display/fisid_113621)
Senior Instructor; MA, Miami University Oxford Campus

Williams, Lawrence Edwin (https://experts.colorado.edu/display/fisid_145743)
Assistant Professor/Associate Professor; PhD, Yale University

Willis, Michael Jared (https://experts.colorado.edu/display/fisid_152040)
Senior Instructor; MBA, Brigham Young University

Winn, Daryl
Professor Emeritus

Yao, Xin (https://experts.colorado.edu/display/fisid_147215)
Assistant Professor; PhD, University of Washington

York, Jeffrey Glenn (https://experts.colorado.edu/display/fisid_148387)
Assistant Professor; PhD, University of Virginia

Zechman, Sarah Louise Center (https://experts.colorado.edu/display/fisid_156016)
Associate Professor; PhD, University of Pennsylvania

Zender, Jaime (https://experts.colorado.edu/display/fisid_122563)
Professor; PhD, Yale University

Zhang, Dan (https://experts.colorado.edu/display/fisid_149619)
Associate Professor/Assistant Professor; PhD, University of Minnesota Twin Cities

Courses

BADM 1250 (1.5) First Year Seminar for Business

Surveys the entire undergraduate experience and includes topics, issues, and practices that focus on the professional, academic, and leadership growth of a business student. It addresses how to make an effective transition to college and puts students on a path to become well-rounded, engaged and globally-minded. Students will acquire the knowledge and skills to take advantage of all the opportunities and support services available to them while learning to balance the challenges and expectations of their business degree. A sample of the topics covered include: transition to college, dealing with academic rigor, developing a professional tool kit—resume and cover letter preparation, interview skills, project management, working in teams and public speaking—and preparing for the role as a global business leader.

Requisites: Restricted to Business (BUSNU) majors only.

Grading Basis: Pass/Fail

BADM 1260 (2) First-Year Global Experience

In today's world of increased mobility, globally aware students have more choices for employment upon graduation and are immediately ready to contribute in global environments. They are aware of global issues and cultural differences, and their global mindset allows them to recognize good ideas from whenever they might come and new market/product opportunities wherever they might exist. This course is the first step toward the development of a global mindset. It provides a meaningful global experience to first-year business students through an in-depth perspective of a specific country or region outside the United States and a short academic trip to the region.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 2010 (1) Excel in Business

Teaches beginner to intermediate level Excel skills, emphasizing efficient use of Excel to make sense of substantial data sets. The course is designed to increase students' proficiency with Excel through a series of hands-on workshops. The workshops have a business problem solving orientation and use real data from Leeds' corporate partners. The workshops emphasize the most important skills that employers value.

Requisites: Restricted to Business (BUSNU) majors only.

Grading Basis: Pass/Fail

BADM 2050 (3) Honors/Special Topics

Variable topics in business, drawing from a variety of disciplines.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: At least a 3.50 cumulative GPA is required.

Additional Information: Arts Sciences Honors Course

BADM 2880 (3) Special Topics

Explores historical developments, contemporary issues, industry trends and best practices pertinent to the business of sports. Examines how sports enterprises are managed and the impacts that such enterprises have on the economic and social fabric of communities. Designed to provide sufficient background for educated consumption of this literature and pursuit of further study if desired.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

BADM 2900 (1-3) Independent Study

Department consent and departmental form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 3100 (1) Professional Development

Designed to provide opportunities to understand and develop professional competencies for successful careers in business. Designed to increase knowledge of job search strategies and formulate a career management plan for transitioning to the workplace. Topics such as resumes, cover letters, personal branding, job search strategies, internships, career choices, networking and social media will be covered. A Self-Marketing Plan will be developed to help focus on long-term career goals.

Requisites: Restricted to Leeds School of Business majors only.

Grading Basis: Pass/Fail

BADM 3880 (3) Special Topics

Introduces students to the many facets of the marketing of sport and marketing through sport. Theoretical and practical applications of marketing sport are examined. Provides students with an understanding of current marketing concepts and best business practices, related to sports enterprises and a foundation for pursuit of further study and work in sports and event marketing.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

BADM 3900 (1) Independent Study

Department consent and departmental form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 3930 (1-6) Internship

Student training and participation in government or industry environment under faculty supervision. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of BCOR 1000 and BCOR 1020 and BCOR 2000 and BCOR 2400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Pass/Fail

BADM 4820 (1-6) Special Topics

Variable topics in business drawing from a variety of business disciplines.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Business (BUSN) majors with 52-180 units completed.

BADM 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Business Administration.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

BADM 4830 (1-3) Special Topics

Various topics in business and society drawing from a variety of business disciplines.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 4900 (1-3) Independent Study

Intended only for exceptionally well qualified business seniors. Department form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 4910 (2) VITA-Volunteer Tax Assistance

Offers students the opportunity to gain professional work experience in an accounting position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential.

Requisites: Requires prerequisite courses of BCOR 2000 and ACCT 3440 or ACCT 5440 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

Grading Basis: Pass/Fail

Business Administration - Bachelor of Science (BS)

All business students pursuing a bachelor's degree in business administration must complete the prescribed courses in at least one area of emphasis. The school offers programs in four areas of emphasis: accounting, finance, management and marketing. An area of emphasis consists of a minimum of 18 credit hours taken at CU Boulder.

In addition to the area of emphasis, students also may complete an area of application. The school offers the following areas of application: entrepreneurship and small business management, international business and real estate. An area of application consists of a minimum of 9 credit hours taken at CU Boulder.

Accounting Emphasis

The accounting area of emphasis prepares students for careers in which they will develop, analyze and interpret complex financial data. Accounting majors become experts in "the language of business." This expertise prepares them for careers in CPA firms, business consulting, industry (from Fortune 500 companies to small entrepreneurial enterprises), not-for-profit enterprises or government. Accountants who pursue careers in public accounting might become partners in public accounting and consulting firms. Those who begin their careers in industry might have positions as a chief executive officer (CEO), chief financial officer (CFO), chief accounting officer (CAO) or controller, tax specialist, internal auditor, accounting systems analyst, financial analyst or managerial accountant. Many students begin their careers in public accounting firms and move to industry or government after several years of experience. Employers seek students with skills in communication, interpersonal interactions, analytical thinking, problem solving and integrity.

The major branches of study in the accounting area of emphasis are:

1. financial accounting / analysis and audit, and
2. tax planning and compliance.

Basic coursework in accounting focuses on developing a comprehensive understanding of the theory and concepts underlying the presentation of financial and operating information about an enterprise to external and internal users. Additional course work exposes the student to income taxation of business enterprises and individuals, the practice and principles of auditing and assurance services and cost management. Specialization is available through graduate work.

Professional Certification as a CPA or CMA

Most accounting students from the University of Colorado earn professional credentials within a year or two of receiving their degrees. The two most widely-recognized professional certifications are the

certified public accountant (CPA) and certified management accountant (CMA).

The CPA is a state-granted license, for which each state sets its own requirements. All states require 150 total credit hours of study to be licensed as a CPA, thus earning a degree with only 120 credit hours will not meet licensure requirements. Although the CPA requirements of most states have similar components, the specifics of those requirements differ greatly. Most states set requirements for the following before a CPA license will be granted:

1. background checks
2. education
3. CPA Exam passage
4. work experience

Not only do state requirements differ greatly from one state to another, those requirements frequently change. It is very important that the accounting student obtain the guidelines for the relevant state to ensure proper development of his or her degree plan (see NASBA.org (<http://NASBA.org>) or the website of the particular state's board of accountancy).

The CPA license is a legal requirement for someone to perform financial statement audits, but is not legally required to perform other kinds of accounting work. It is important to note, however, that many professional accounting positions set CPA licensure as a job requirement even where it is not legally required, thus a CPA license is a valuable credential for any accounting professional. As a result, most students completing an accounting emphasis at Leeds continue into the concurrent bachelor's and master's degree program (see Concurrent Degree Programs below) to seek their CPA license.

The CPA's expertise typically focuses on presentation and analysis of financial information for an external user. The CMA's primary focus is improving information for the internal user. Professional accountants' expertise in financial matters and their understanding of company operations through financial information prepare them to become key players and critical decision makers for all aspects of business creation, operation and transformation.

As is the case at most colleges and universities, simply meeting the requirements to receive a degree with an undergraduate emphasis in accounting at Leeds will not necessarily meet all of the specific requirements for CPA licensure of any particular state including Colorado. Prior to being licensed, a candidate must be granted permission by a state's board of accountancy to take the CPA Examination. As with the overall requirements for licensure, the specific requirements and timing when students can take the exam differ greatly for different states, all of which makes it crucial for the student to develop the degree plan in conjunction with applicable state requirements.

The CMA is a different type of certification because it not granted by a state, but rather by the Institute of Management Accountants, which is a professional organization. The requirements are the same regardless of where an applicant lives. The website for the Institute of Management Accountants provides information about becoming a certified management accountant (CMA). Though not legally required for any kinds of positions in any state, the CMA is also a valuable professional credential.

Finance Emphasis

Finance is essential to business. Finance faculty boast expertise in foundational concepts like corporate finance and macroeconomics, as well as specialized areas like mergers and acquisitions, derivatives and foreign exchange markets. Students within the program benefit from access to the Burrige Center for Securities Analysis and Valuation and the CU Real Estate Center. Our curriculum prepares students to succeed in areas such as financial management, business economics and real estate. The finance program addresses issues in the financial services and securities area, including topics related to high technology firms, large corporations, and entrepreneurial companies. The finance program is designed to provide students with in-depth exposure to the background necessary for entry-level positions in various areas of financial management. Students study financial management, money and capital markets, investments and derivative securities, and financial institutions. This program enables students to develop the ability to evaluate financial problems and formulate sound financial decisions and policies. Although emphasis is on financial management of profit-oriented organizations, the principles and concepts covered are applicable to nonprofit and governmental organizations.

Management & Entrepreneurship Emphasis

Advances in business knowledge and technology have radically changed business systems, organization structures, and processes. As a result, critical to today's businesses is the ability to get the right information to the right people at the right time, so that both strategic and operational decisions are made properly and quickly. Students majoring in management & entrepreneurship will learn to recognize the pivotal role that information plays in the business world and to use their knowledge to increase business competitiveness. Students completing the management & entrepreneurship area of emphasis are viewed by potential employers as having the education required to successfully compete in the team-oriented, horizontally organized and globally competitive environments of the 21st century. The management & entrepreneurship area of emphasis prepares students for careers managing people, operations, and information. Management & entrepreneurship students must choose one of three tracks: human resource management, information management or operations management.

Marketing Emphasis

The Marketing Division at the Leeds School of Business is distinguished by its scholarly impact on academic marketing thought and by exceptional teaching. Research by our faculty is our strength. Research is published in prestigious publications such as the *Journal of Consumer Research*. Our faculty bring marketing theory and practical solutions to students and prepare them for careers in business and in academics. The increasingly global marketplace, coupled with new communication vehicles such as the Internet, have changed the traditional tactics used in marketing. Today's marketing practitioners must understand the unique challenges of serving foreign markets and how to effectively convey their messages to consumers throughout the world. The marketing program develops students' analytic and decision-making skills in such areas as advertising, market research, brand/product management, selling and sales management, distribution, relationship marketing, international marketing, marketing consumer products and services, and marketing nonprofit organizations. Key concepts focus on identifying customer needs and wants, developing products and services to meet those demands, establishing communications to promote products and services, and monitoring transactions and customer responses to guide future activities. Marketing concepts apply to tangible products, services

and ideas, consumer and business markets, and domestic and global markets.

Concurrent Degree Programs

BS/MS in Business Administration and Accounting

Qualified Leeds undergraduate students may apply for a five-year concurrent bachelor's/master's program. Student typically begin the concurrent program in the fall of their senior year, and graduate with both the BS and MS degrees after five years. The concurrent degree program is a 150 credit-hour program. Students earn a BS in Business Administration (120 credits) with an area of emphasis in Accounting, Finance or Accounting and Finance, and an MS in Accounting (30 credits).

For more information, visit the Concurrent BS & MS Accounting or Taxation (<http://www.colorado.edu/business/academic-programs/undergraduate-programs/accounting/concurrent-bsba-ms-accounting>) webpage.

BS/MS in Business Administration and Taxation

Qualified Leeds undergraduate students may apply for a five-year concurrent bachelor's/master's program. Student typically begin the concurrent program in the fall of their senior year, and graduate with both the BS and MS degrees after five years. The concurrent degree program is a 150 credit-hour program. Students earn a BS in Business Administration (120 credits) with an area of emphasis in Accounting, Finance or Accounting and Finance, and an MS in Taxation (31 credits).

For more information, visit the Concurrent BS & MS Accounting or Taxation (<http://www.colorado.edu/business/academic-programs/undergraduate-programs/accounting/concurrent-bsba-ms-accounting>) webpage.

BS/MS in Business Administration and Telecommunications

The Leeds School of Business also offers a unique program that allows undergraduates the opportunity to earn a bachelor's and master's degree simultaneously. The joint program graduates students with a bachelor's degree from the Leeds School of Business and a master's degree from the College of Engineering in telecommunications. For more information, see engineeringanywhere.colorado.edu/itp/ (<http://engineeringanywhere.colorado.edu/itp/>).

Requirements

General Requirements

Total Credit Hours

Students must complete a minimum of 120 acceptable credit hours from the following categories.

- **Business core (30 credit hours):** Consists of integrated course work through which students develop key skills such as communication, teamwork and leadership while learning fundamentals of business and working on live cases.
- **Business area of emphasis (18 credit hours):** Emphases are available in accounting, finance, management or marketing, and require a minimum of three semesters to complete.
- **Business electives (16 credit hours)**
- **Nonbusiness requirements (39 credit hours):** Consists of course work from the College of Arts and Sciences core requirements.

- **Nonbusiness electives (17 credit hours)**

The school reserves the right to disallow any credit that it determines is not appropriate academic credit.

Minimum Grade Point Average

- A cumulative grade point average of 2.00 in the area of emphasis and all grades in the 18 credit hours must have a grade of C- or higher (no pass/fail credit hours can be applied to the area).
- A minimum scholastic cumulative GPA of 2.00 is required for all courses attempted at the university.
- A cumulative 2.000 is required for all business courses attempted at the university.
- A cumulative grade point average of 2.00 is required in the area of application courses.

Required Courses and Semester Credit Hours

Business Core

BCOR 1015	The World of Business	3
BCOR 1025	Data Analysis in Business	3
BCOR 1030	Communication Strategy	3
BCOR 2001	Principles of Marketing and Management	3
BCOR 2002	Principles of Accounting and Finance	3
BCOR 2003	Business Law, Ethics and Social Responsibility	3
BASE 2101	BCOR Applied Semester Experience 1: Early Stage	3
BASE 2102	BCOR Applied Semester Experience 2: Growth Stage	3
BASE 2103	BCOR Applied Semester Experience 3: Mature Stage	3
BASE 2104	BCOR Applied Semester Experience 4: Case Project	3

Area of Emphasis

Students must choose an area of emphasis in accounting, finance, management or marketing. 18

Business Electives

Business courses required by specific areas in excess of the 18 credit hours listed under areas of emphasis may count as business electives. 16

Nonbusiness Requirements

Students in the Leeds School of Business are required to complete course work from the College of Arts and Sciences core requirements, including classes from the following categories: 39

Mathematical skills ²	
Contemporary societies ²	
Written communication ²	
Historical context	
Human diversity	
United States context	
Literature and the arts	
Natural sciences	
Ideals and values	

Nonbusiness Electives

Students are required to complete 17 credit hours of nonbusiness electives. ³ 17

Total Credit Hours 120

¹ A list of courses that fulfill specific requirements for each area is available on the College of Arts and Sciences' Core Curriculum (<http://www.colorado.edu/artsandsciences/student-resources/core-curriculum>) webpage.

² Leeds students are required to take microeconomics and macroeconomics, specific math and writing courses to fulfill these categories. Contact undergraduate student services for more information, or visit leeds.colorado.edu (<https://leeds.colorado.edu>).

³ Not all classes are accepted as elective credit hours. Generally, to be acceptable, electives must have a form of assessment such as a term paper and/or examinations and must be regular classroom-type courses. Course coverage must be college level, must not be repetitious of other work applied toward the degree, must be academic as opposed to vocational or technical and must be part of the regular university offerings. Contact Undergraduate Student Services or visit the school's Degree Requirements (<http://www.colorado.edu/business/academic-programs/undergraduate-programs/undergraduate-degree/degree-requirements>) webpage for more information about the number of business elective credit hours required.

Residence

Students must complete 30 credit hours of business courses in residence on the Boulder campus after admission to the college, including the 18 credit hours in the area of emphasis and the 9 credit hours in the area of application (included in the business electives). Students must be in residence at CU Boulder and must be registered as business degree students during the term of graduation.

Areas of Emphasis

Accounting Emphasis

This degree may be earned by a student who takes 18 credit hours of accounting beyond the core. The 18-credit-hour requirement for the degree does not meet the educational requirements to be licensed as a CPA in any state. This option might be chosen by a student who does not want to become professionally certified, but who seeks a career involving accounting and financial analysis in industry, government or nonprofit enterprises. This also might be chosen by a student choosing a dual emphasis, such as accounting and finance or accounting and information systems.

Required Courses and Semester Credit Hours

ACCT 3220	Corporate Financial Reporting 1	3
ACCT 3230	Corporate Financial Reporting 2	3
ACCT 3320	Cost Management	3
ACCT 3440	Income Taxation of Individuals	3
ACCT 4850	Senior Seminar - Accounting Ethics	3
Select one of the following: 3		
ACCT 4240	Advanced Financial Accounting	
ACCT 4250	Financial Statement Analysis	
ACCT 4330	Advanced Cost Management	
ACCT 4540	Accounting Information Systems	
ACCT 4620	Auditing and Assurance Services	
ACCT 4800	Accounting for Government and Nonprofit Organizations	
ACCT 4820	Topics in Business (ACCT & FNCE for Energy Ind.)	

ACCT 4827	Integrated Reporting for Socially Responsible Strategies	
Total Credit Hours		18

CPA Licensure Requirements

All states require 150 total credit hours for licensure as a CPA and most require additional accounting and other business courses. Most states do not require a master's degree. Thus, one route to licensure is obtain a BS with an accounting emphasis, but take additional course work to meet the specific requirements of the state(s) where the student expects to practice. Students can generally find the current requirements for a particular state at the website for that state's board of accountancy, or at NASBA.org (<http://nasba.org>). It is possible that one or more courses that a state requires for CPA certification is not available to undergraduates at CU Boulder; in such a case the student could take those courses either in person or online at a different institution.

Finance Emphasis

Students with a finance emphasis must take 18 credit hours of finance courses beyond the BCOR sequence. Students interested in a finance area of emphasis should plan to take FNCE 2010 during their sophomore year.

Required Courses and Semester Credit Hours

FNCE 2010	Fundamentals of Financial Analysis (prereqs., BCOR 1025, BCOR 2002 and MATH 1112)	3
FNCE 3010	Corporate Finance (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104 and FNCE 2010 minimum grade: C)	3
FNCE 3030	Investment and Portfolio Management (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104 and FNCE 2010 minimum grade: C)	3
ACCT 3220	Corporate Financial Reporting 1 (prereqs., BCOR 2001, BCOR 2002, BCOR 2003)	3
FNCE 4040	Derivative Securities (prereqs., FNCE 3010 and FNCE 3030)	3
FNCE 4850	Business Senior Seminar in Finance (prereqs., FNCE 3010 and FNCE 3030)	3
Total Credit Hours		18

The required courses represent a minimum requirement for competence in financial analysis and decision-making. Combinations of the upper division elective finance courses allow students to structure their learning in preparation for specific career paths.

FNCE 4000	Financial Institutions Management (prereqs., FNCE 3010, FNCE 3030)	3
FNCE 4050	Capital Investment Analysis (prereqs., FNCE 3010)	3
FNCE 4060	Special Topics in Finance (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104)	1-6
FNCE 4070	Financial Markets and Institutions (prereqs., FNCE 2010)	3
FNCE 4820	Topics in Finance (Experimental Course (prereqs., FNCE 2010)	3
FNCE 4820	Topics in Finance (Fixed Income Securities (prereqs., FNCE 3010, FNCE 3030)	3
FNCE 4826	Experimental Seminar: Corporate Governance (prereqs., FNCE 3010)	3
FNCE 4830	Seminar in Investment Banking (prereqs., admission is by application)	3

FNCE 4831	Seminar in Investment Management (prereqs., FNCE 3010, FNCE 3030)	3
APPM 4720	Open Topics in Applied Mathematics (prereqs., FNCE 3010, FNCE 3030)	3
ESBM 4570	Entrepreneurial Finance (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104)	3
INBU 4200	International Financial Management (prereqs., BASE 2101, BASE 2102, BASE 2103, BASE 2104)	3
REAL 4100	Real Estate Finance and Investment Analysis (prereqs., REAL 3000)	3

Investment Banking Track

In addition to the required courses, students interested in a career in investment banking should consider taking the following courses:

FNCE 4830	Seminar in Investment Banking	3
ACCT 3230	Corporate Financial Reporting 2	3
FNCE 4050	Capital Investment Analysis	3
Total Credit Hours		9

Investment Management Track

In addition to the required courses, students interested in a career in investment management should consider taking the following courses:

FNCE 4050	Capital Investment Analysis	3
FNCE 4831	Seminar in Investment Management	3
FNCE 4820	Topics in Finance	3
Total Credit Hours		9

Commercial Banking Track

In addition to the required courses, students interested in a career in commercial banking should consider taking the following courses:

FNCE 4000	Financial Institutions Management	3
FNCE 4820	Topics in Finance	3
FNCE 4070	Financial Markets and Institutions	3
Total Credit Hours		9

Corporate Finance/Consulting Track

In addition to the required courses, students interested in a career in corporation finance should consider taking the following courses:

ESBM 4570	Entrepreneurial Finance	3
ACCT 3230	Corporate Financial Reporting 2	3
FNCE 4050	Capital Investment Analysis	3
Total Credit Hours		9

Entrepreneurial Finance Track

In addition to the required courses, students interested in a career in entrepreneurial finance should consider taking the following courses:

ESBM 4570	Entrepreneurial Finance	3
INBU 4200	International Financial Management	3
FNCE 4826	Experimental Seminar: Corporate Governance	3
Total Credit Hours		9

Personal Financial Planning Track (PFP)

Program includes six courses, with two required courses, FNCE 4040 and FNCE 4850 waived, see below.

FNCE 2820	Introduction to Personal Financial Planning	3
ACCT 3440	Income Taxation of Individuals	3
FNCE 3040	Insurance, Risk Management and Retirement Planning (note: replaces FNCE 4040)	3
FNCE 3060	Estate Planning	3
FNCE 4840	Personal Financial Plan Development Capstone (note: replaces FNCE 4850)	3
Total Credit Hours		15

Management & Entrepreneurship Emphasis

Management & entrepreneurship students must choose one of the following tracks: information management, leadership, operations, strategy and entrepreneurship, or talent management.

Information Management Track

There are three required courses in the information management track. IM students inclined toward careers in technical information systems are encouraged to take programming courses as non-business electives (such as CSCI 1300 or ATLS 3519).

Required Courses and Semester Credit Hours

Required Courses		
MGMT 3030	Critical Leadership Skills	3
MGMT 3200	Business Analytics	3
MGMT 4850	Senior Seminar in Management	3
Elective Courses		
Select three of the following:		9
MGMT 3210	Business Application Programming	
MGMT 4205	Business Data Management	
MGMT 4220	Business Technologies	
MGMT 4230	Design of Usable Business Systems	
MGMT 4140	Project Management	
Total Credit Hours		18

Leadership Track

Required Courses		
MGMT 3030	Critical Leadership Skills	3
MGMT 4040	Individual, Team, and Organizational Development	3
Elective Courses		
Select three of the following: ¹		9
CESR 4000 & CESR 4001	Leadership Challenges I: Exercises in Moral Courage and Leadership Challenges II: Exercises in Moral Courage	
MGMT/CESR 4828	Experimental Seminar: Corporate Boards in Action	
INBU 3300	International Business and Management	
MGMT 3010	Negotiation and Conflict Management	
Required Senior Capstone Course		
MGMT 4850	Senior Seminar in Management	3
Total Credit Hours		18

¹ Additional management (MGMT) courses may be taken & applied to business electives.

Operations Management Track

There are three required courses in the operations management track. Students focusing on operations are also encouraged to take MGMT 4150.

Required Courses and Semester Credit Hours

Required Courses		
MGMT 3100	Operations Management	3
MGMT 4110	Supply Chain Management	3
Elective Courses		
Select three of the following:		6
MGMT 4120	Managing Business Processes	
MGMT 4130	Sustainable Operations	
MGMT 4140	Project Management	
MGMT 4150	International Operations Management (only one can apply to the OPS area)	
	or INBU 415 International Operations in Hong Kong	
MGMT 4820	Topics in Business	
Required Senior Capstone Course		
MGMT 4850	Senior Seminar in Management	3
Total Credit Hours		15

Strategy & Entrepreneurship Track

Required Courses and Semester Credit Hours

Required Courses		
ESBM 3700	Entrepreneurial Environments	3
ESBM 4830	Entrepreneurship Business Planning and Preparation	3
Elective Courses		
Select three of the following: ¹		9
CESR/MGMT 4828	Experimental Seminar: Corporate Boards in Action	
ESBM 4570	Entrepreneurial Finance	
INBU 3300	International Business and Management	
MGMT 3030	Critical Leadership Skills	
MGMT 4020	Hiring and Retaining Critical Human Resources	
MGMT 4030	Managing Employee Reward Systems	
MGMT 4040	Individual, Team, and Organizational Development	
Required Senior Capstone Course		
MGMT 4850	Senior Seminar in Management	3
Total Credit Hours		18

¹ Additional entrepreneurship (ESBM), management (MGMT) and other courses may be taken as business electives.

Talent Management Track

The talent management track provides students with the knowledge and skills necessary to earn certification in human resources from the Society of Human Resources, the principal professional society in the field. Graduates are qualified to act as human resource generalists in small, medium and large companies; specialists in organizations with focused human resource units; or well-rounded general managers in any organization.

There are three required courses in the HR management track. Students focusing on talent management are also encouraged to take INBU 3300.

Required Courses and Semester Credit Hours**Required Courses**

MGMT 3030	Critical Leadership Skills	3
MGMT 4040	Individual, Team, and Organizational Development	3

Elective Courses

Select three of the following: 9

MGMT 3010	Negotiation and Conflict Management	
MGMT 4010	Redefining the Employee-Employer Relationship	
MGMT 4020	Hiring and Retaining Critical Human Resources	
MGMT 4030	Managing Employee Reward Systems	

Required Senior Capstone Course

MGMT 4850	Senior Seminar in Management	3
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Total Credit Hours 18

Marketing Emphasis

Students with a marketing emphasis must take 18 credit hours of marketing courses beyond BCOR 2001 or BCOR 2400. Students pursuing a marketing emphasis will need three semesters to complete the required course work after taking BCOR 2001 or BCOR 2400.

Required Courses and Semester Credit Hours

MKTG 3250	Buyer Behavior (prereq., BCOR 2001 or BCOR 2400)	3
MKTG 3350	Marketing Research and Analytics (prereq., BCOR 2001 or BCOR 2400)	3
MKTG 4250	Product Strategy (prereqs., MKTG 3250 and MKTG 3350)	3
MKTG 4300	Pricing and Channels of Distribution (prereqs., MKTG 3250 and MKTG 3350)	3
MKTG 4550	Advertising and Promotion Management (prereqs., MKTG 3250 and MKTG 3350)	3
MKTG 4850	Senior Seminar in Marketing (prereqs., any two of MKTG 4250, MKTG 4300 and MKTG 4550, with the remaining one of these courses taken as a corequisite)	3

Total Credit Hours 18

Business - Minor

In 2013 the Leeds School of Business launched a 12-credit business minor so that all CU Boulder students could gain business fundamentals, increasing their immediate impact as new hires. The business minor is now the largest minor on campus, attracting students from more than 60 majors across the university.

To learn more, visit the Leeds School of Business (<http://www.colorado.edu/leeds/minor-business>) website.

Requirements**Admission Requirements**

The admissions process consists of an online application and a one-page resume.

To be eligible for admission, students must have a minimum of 12 completed CU credit hours, a 2.0 GPA, be in good academic standing and have earned at least a C- in a preapproved statistics or calculus course. Students currently enrolled in a preapproved statistics or calculus course may apply and be conditionally admitted pending final course grade.

Fees

Students accepted into the business minor must pay a \$500 per course fee, or \$2000 for the 4-course/12-credit-hour program.

Course Requirements

In 2013, the Leeds School of Business launched a 12-credit-hour business minor so that all CU Boulder students could gain business fundamentals, increasing their immediate impact as new hires.

The program takes a minimum of three semesters to complete; it is recommended that students apply before their junior year, but no later than the first semester of their junior year.

Required Courses and Semester Credit Hours**Required Courses**

BUSM 2001	Principles of Marketing and Management	3
BUSM 2002	Financial Accounting and Finance	3
BUSM 4001	Professional Business Plan Development	3

Electives

Select one of the following: 3

BUSM 3001	Managing Innovation in Organizations	
BUSM 3002	Business and Financial Analytics	
BUSM 3003	New Venture Creation: Intro to Entrepreneurship	
BUSM 3004	Global Business for Business Minors	

Total Credit Hours 12

While not required, student may complete multiple tracks for increased breadth of application.

Students participate in a business competition followed by a celebratory graduation where competition winners are recognized by Leeds and the local business community.

Business minor courses are available during fall and spring semesters only, with the global business track being the exception. Our global business track occurs abroad during Maymester and is available to a select few.

Entrepreneurial Studies - Certificate

Whether working for a large global corporation or a small start-up venture, graduates will be valued for their ability to innovate, lead change, recognize emerging markets and launch new products. The entrepreneurial studies program is designed to develop an individual's abilities to create, discover and exploit opportunities in start-up ventures or existing organizations.

The entrepreneurial studies program at the Leeds School of Business is internationally recognized for the quality of its instruction and the capabilities of our students. Within the Leeds School, the Deming Center for Entrepreneurship has served as a rich resource for students with interests in entrepreneurship—coordinating the academic curriculum, providing help with internship and job placement, creating links with the business community and sponsoring networking opportunities and many special events.

The curriculum focuses on experiential learning. Courses are designed to give students hands-on experiences that develop the ability to act on opportunities. Students may begin the study of entrepreneurship in their junior year.

Requirements

A certificate in entrepreneurial studies is granted to students who fulfill the following requirements:

1. complete the three courses listed below with at least a 3.00 GPA;
2. complete an entrepreneurship internship with a start-up company who's been in business for 5 years or less and has less than 200 employees and complete a 2-3 page write-up about it;
3. participate in entrepreneurship-related extracurricular activities and provide a short write-up on their experiences; and
4. pass a written exam in entrepreneurship at the conclusion of their studies.

Required Courses and Semester Credit Hours

ESBM 3700	Entrepreneurial Environments	3
ESBM 4570	Entrepreneurial Finance	3
ESBM 4830	Entrepreneurship Business Planning and Preparation	3

NOTE: Students seeking internships should complete ESBM 3700.

For more information, visit the Leeds School's Deming Center for Entrepreneurship (<http://www.colorado.edu/business/deming>) webpage.

Global Business - Certificate

The globalization of the marketplace has created a need for managers who can function effectively in the international business environment. Despite this movement toward globalization, there remain significant environmental differences (cultural, economic and political) between countries and/or regions. Managers in an international business must be sensitive to these differences and also must adopt the appropriate policies and strategies for dealing with them.

To address these issues, the Leeds School of Business offers an area of application in international business consisting of 9 credit hours. Students completing additional requirements may earn a certificate in international business. The certificate program builds on the students' understanding of the functional areas of business and provides them with an appreciation of the international environment. It also supplies them with a framework for developing policies and strategies appropriate for the global marketplace.

Requirements

Required Courses and Semester Credit Hours

Select one of the following:	3
INBU 3300 International Business and Management	
INBU 4200 International Financial Management	
Global Seminar: London International Finance	
Select one of the following:	3
MGMT 4150 International Operations Management	
Global Seminar: International Operations in Hong Kong	
Select one of the following:	3
INBU 3450 International Marketing	
Global Seminar: Marketing in the Global Environment	
Total Credit Hours	9

In addition to the three INBU courses, the certificate program requires the completion of the following requirements:

- six credit hours of additional international course work, such as international business electives not on the required list above, or courses in economics, geography, political science, history or language. Courses must be selected from an approved list maintained by the Leeds Undergraduate Advising Office.
- a significant international experience, which may be satisfied in a number of ways including participation in a study abroad program, an international academic internship, service work in an international location or an internship with an organization focused on global business and economics. Students should check with the Leeds Undergraduate Advising Office to verify that their global experience will qualify to meet this requirement.
- Students must apply online to receive the global business certificate.

Operations and Information Management - Certificate

Advances in business knowledge and technology have radically changed business systems and processes—for example, how organizations buy and sell goods and services, integrate their supply chain and logistic systems and reach or retain customers. As a result, critical to today's businesses is the ability to get the right information to the right people at the right time, so that both strategic and operational decisions are made properly and quickly. To help students develop this ability, the Leeds School of Business offers the OPIM certificate.

Requirements

Students who are not in the OM or IM track in the Management and Entrepreneurship Division can take any three courses listed in the course description section below. Students majoring in the OM track can take any three IM track courses, while students majoring in the IM track can take any three OM track courses.

To complete the OPIM certificate requirements, all students must also complete a faculty-supervised OPIM research project (MGMT 4900) or faculty-supervised OPIM internship (MGMT 4910).

In addition, students are required to maintain an overall GPA of 3.00 or higher for the selected courses and receive a letter grade of B- or higher in each of the three courses. Successful completion of the certificate program will appear on the student's transcript.

The following illustrates some of the courses that students not majoring in IM or OM might want to take.

Accounting Students

MGMT 4140	Project Management	3
MGMT 4210	Systems Thinking	3
ACCT 4540	Accounting Information Systems (Prereq: ACCT 3220)	3
or ACCT 5540	Accounting Information Systems	

Finance Students

MGMT 3200	Business Analytics	3
MGMT 3210	Business Application Programming	3
MGMT 4210	Systems Thinking	3

Management (HR Track) Students

MGMT 3200	Business Analytics	3
MGMT 4120	Managing Business Processes	3
MGMT 4210	Systems Thinking	3

Marketing Students

MGMT 3200	Business Analytics	3
MGMT 4110	Supply Chain Management	3
MGMT 4210	Systems Thinking	3

Real Estate - Certificate

The real estate area of application is designed to provide students with exposure to the concepts, tools and techniques necessary for entry-level positions. A career in real estate provides an opportunity for individuals to operate as entrepreneurs whether they are brokers, appraisers, developers, property managers, consultants or investors. An integrated process is followed in the three application area courses to prepare students for real estate careers.

Requirements

The real estate certificate program allows students to broaden their knowledge and understanding of real estate through a multidisciplinary focus, whereby courses are taken outside of the Leeds School of Business. See the CU Real Estate Center (<http://realestate.colorado.edu>) website for a list of approved electives and internships.

Required Courses and Semester Credit Hours

Required Courses

REAL 3000	Principles of Real Estate	3
REAL 4000	Real Estate Law	3
REAL 4100	Real Estate Finance and Investment Analysis	3

Electives

Courses in Program in Environmental Design OR from the construction management area in the Department of Civil, Environmental and Architectural Engineering of the College of Engineering and Applied Science	6
Academic internship in real estate practice or related area	3
Total Credit Hours	18

Socially Responsible Enterprise - Certificate

CU Boulder's Leeds School of Business is one of the few undergraduate business schools in the nation that emphasizes socially responsible conduct in business throughout its curriculum. The Center for Education on Social Responsibility (CESR) helps undergraduate students become outstanding business leaders of tomorrow by preparing them to meet the ethical challenges posed by an increasingly competitive, globally connected business world.

CESR offers the certificate in socially responsible enterprise (SRE) to business students who seek to distinguish themselves in the field of socially responsible business, whether their unique interests lie in environmental sustainability, social entrepreneurship, corporate ethics or values-driven leadership. Students who complete the certificate will develop the practical knowledge and marketable experiences that will

distinguish them as business professionals who strive to make a positive social impact.

Requirements

Interested students need to register with the CESR office and must graduate with a 3.00 GPA.

Required Courses and Semester Credit Hours

General Courses

Select two of the following in the areas of philosophy, environmental studies, political science, economics, communication, civil engineering or sociology (check prerequisites before enrolling): 6

ECON 3545	Environmental Economics	
ECON 4292	Migration, Immigrant Adaptation, and Development	
ECON 4626	The Economics of Inequality and Discrimination	
ECON 4774	Economic Reform in Developing Countries	
ECON 4784	Economic Development	
ENVD 4361	Special Topics: Social Factors in Design	
ENVS 3070	Energy and the Environment	
ENVS 4027	Inequality, Democracy, and the Environment	
ENVS 4100	Special Topics in Environmental Studies	
FNCE 4832	Microfinance	
GEOG 1962	Geographies of Global Change	
GEOG 3682	Geography of International Development	
GEOG 4742	Topics in Environment and Society	
PHIL 2200	Major Social Theories	
PHIL 2140	Environmental Justice	
PSCI 4012	Global Development	
PSYC 2456		
SOCY 2011	Contemporary Social Issues and Human Values	
WRTG 3040	Writing on Business and Society (Section with CSR Emphasis)	

Business Coursework

Select three of the following:	9	
CESR 4000 & CESR 4001	Leadership Challenges I: Exercises in Moral Courage and Leadership Challenges II: Exercises in Moral Courage	
CESR 4005	Business Solutions for the Developing World: Learning through Service	
Global Seminar: Social Entrepreneurship and Innovation (Cocle, Panama)		
CESR/MGMT 4130	Sustainable Operations	
CESR/MGMT 4440	Privacy in the Age of Social Media	
CESR/ACCT 4827	Integrated Reporting for Socially Responsible Strategies	
CESR/MGMT 4828	Experimental Seminar: Corporate Boards in Action	
MGMT 4140	Project Management (must be pre-approved for SRE course work credit)	

MGMT 3030 Critical Leadership Skills

Total Credit Hours

15

NOTE: These courses are in addition to BCOR, the capstone course, as well as any other prerequisites. See course descriptions for prerequisite details.

Experiential Learning

The experiential learning component is meant to give SRE students the freedom to gain practical experience working in a field of social responsibility of particular interest to them. Students must meet with the SRE Certificate Advisor to gain preapproval of their proposed experiential learning experience. Upon completion of the experience, students and their supervisor will complete a brief form (provided by the SRE Certificate Advisor) that documents the student's service. Experiences will be evaluated for application of business skills and social impact.

Experiential learning options include:

- **Intern for an organization (for-profit or nonprofit).** Acceptable internships will be characterized by substantive work that adds value to the organization and contributes to the student's learning. The SRE Certificate Advisor has information on organizations seeking business assistance from Leeds students. Students may also contact Career Connections for information about internships.
- **Service learning through the Study Abroad Office.** The Office of International Education offers study abroad programs focused on service learning. These programs generally span one academic quarter or semester in the host country, during which the student will participate in, and gain credit for, study in a school of higher education. Outside of the classroom, students will work with local institutions and non-governmental organizations on service projects that promote community development. Service learning programs that are approved through the Office of International Education are automatically approved for experiential learning credit for this certificate.
- **Related course work.** Select courses may count toward the experiential learning requirement or toward the business course work requirement, but not toward both. For course descriptions and program details, visit the CESR Learning (<http://www.colorado.edu/business/CESR/cesr-learning>) webpage.

CESR 4005	Business Solutions for the Developing World: Learning through Service	3
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MGMT 4140	Project Management (with advisor approval)	3
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Advisor-approved independent study in a related topic; or an advisor-approved internship of an appropriate nature

Personal Reflection and Statement of Purpose

Upon completion of all certificate requirements, students will reflect on their learning and draft a short reflection paper and a statement of purpose, setting out the values that will guide their conduct and their careers. They will then meet with the CESR faculty advisors to discuss their SRE certificate experience. This final requirement is to remind students why they elected to pursue the certificate and how it will continue to have an impact on their lives after college. Students are encouraged to truly live the statement of purpose.

Cross-College Programs

[ADD OVERVIEW]

Native American and Indigenous Studies - Certificate

The Center for Native American and Indigenous Studies (CNAIS) offers both a graduate and undergraduate certificate in Native American and Indigenous Studies (NAIS). The certificate program offers a unique interdisciplinary curriculum for CU Boulder students interested in studying the history, cultures, languages, arts, policies and rights of Indigenous peoples from the Americas and around the globe. CNAIS encourages interdisciplinary and intersectional study that develops students' awareness of the diversity and complexity of Indigenous peoples, cultures and nations. It also encourages students to link their academic study of Indigeneity with community outreach and service learning.

A founding principle of CNAIS is to value and expand upon the connections and interdisciplinary nature of Native American & Indigenous scholarly work. The issues facing Native American and Indigenous peoples today require expertise from multiple disciplines and draw from scholarship in a number of fields, including art & art history, anthropology, ethnic studies, environmental studies, gender studies, geography, history, law, linguistics, literature and religion. CU Boulder has recruited an unprecedented number of faculty working in a wide array of areas related to NAIS, and already enjoys a high national and international reputation in several of these areas. In pursuing the NAIS certificate, students join a vibrant and growing community at CU Boulder, including graduate and undergraduate students and more than 40 professors.

For more information, visit the Center for Native American and Indigenous Studies (<http://www.colorado.edu/cnaeis>) website.

Requirements

Students pursuing this certificate must complete an undergraduate degree in any of the academic areas offered by CU Boulder, and complete a total of 18 credits of acceptable course work from the certificate program list.

At least 6 of the 12 credit hours of elective courses must be upper division, and students may choose to apply up to 3 credits of independent study/internship toward the credit requirement. Any independent study must be undertaken with a CNAIS core faculty member, and may be done when a student wishes to pursue an individualized course of study not normally offered in the NAIS course offers. Independent study is typically reserved for third- and fourth-year students.

Only nine credits from the student's major or minor may be counted toward the certificate, students must maintain a C average (2.0) or better, and students must earn a grade of C or better in all courses that count toward the certificate.

Required Courses and Semester Credit Hours

Required Courses

ETHN 1023	Introduction to Native American and Indigenous Studies	3
ENGL 4717	Native American and Indigenous Studies Capstone Seminar	3

Electives ¹		12
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At least three of the four required elective courses must be taken outside the student's home department.

Approved Anthropology Courses

ANTH 1105	Exploring a Non-Western Culture: Tibet
ANTH 1120	Exploring a Non-Western Culture: Hopi and Navajo
ANTH 1135	Exploring Cultural Diversity
ANTH 1140	Exploring a Non-Western Culture: The Maya
ANTH 1145	Exploring a Non-Western Culture: The Aztecs
ANTH 1150	Exploring a Non-Western Culture: Regional Cultures of Africa
ANTH 1170	Exploring Culture and Gender through Film
ANTH 2100	Introduction to Cultural Anthropology
ANTH 3100	Africa: Peoples and Societies in Change
ANTH 3160	Peoples of the South Pacific
ANTH 4020	Explorations in Anthropology
ANTH 4045	Introduction to Museum Anthropology
ANTH 4210	Southwestern Archaeology
ANTH 4220	From Olmec to Aztec: The Archaeology of Mexico
ANTH 4224	Archaeology of the Maya and Their Neighbors
ANTH 4270	Plains Archaeology
ANTH 4470	Collections Research Practicum in Cultural Anthropology
ANTH 4630	Nomadic Peoples of East Africa
ANTH 4690	Anthropology of Tibet
ANTH 4740	Peoples and Cultures of Brazil
ANTH 4800	Language and Culture
<i>Approved Art and Art History Courses</i>	
ARTH 3929	Special Topics in Art History
ARTH 4779	Multicultural Perspectives on New Mexican Santos
ARTS 4433	Alternative Printmaking 2
<i>Approved Astronomy Courses</i>	
ASTR 2000	Ancient Astronomies of the World
<i>Approved English Courses</i>	
ENGL 1800	American Ethnic Literatures
ENGL 2717	American Indian Literature
ENGL 3377	Multicultural Literature
<i>Approved Economics Courses</i>	
ECON 3535	Natural Resource Economics
ECON 3545	Environmental Economics
ECON 4524	Economic History of the United States
<i>Approved Ethnic Studies Courses</i>	
ETHN 1123	Exploring a Non-Western Culture: Hopi and Navajo
ETHN 2013	Critical Issues in Native North America
ETHN 2203	American Indians in Film
ETHN 2703	American Indian Religious Traditions
ETHN 2713	American Indian Literature
ETHN 3103	Selected Topics in American Indian Studies
ETHN 3213	American Indian Women
ETHN 3403	Indigenous Rights and Red Power Movement
ETHN 4213	Indigenous Futurisms: Speculative Genres and Native Tomorrows
ETHN 4353	Indigenous Traditions and Law: A Global Perspective
ETHN 4553	Indigenous Representations in the United States
ETHN 4951	Senior/Graduate Seminar in Ethnic Studies

Approved Geography Courses

GEOG 3672	Gender and the Global Economy
GEOG 3812	Mexico, Central America, and the Caribbean
GEOG 3832	Geographies of South Asia
GEOG 3862	Geography of Africa
GEOG 4812	Environment and Development in South America
<i>Approved History Courses</i>	
HIST 1018	Introduction to Early Latin American History to 1810
HIST 4018	Aztecs, Incas, and the Spanish Conquest of the Americas
HIST 4117	Colorado History
HIST 4118	History of Mexico to 1821
HIST 4416	Environmental History of North America
HIST 4617	Native North American History I: Human Settlement to 1815
HIST 4627	Native North American History II: 1815 to Present
<i>Approved Linguistics Courses</i>	
LING 3220	American Indian Languages in their Social and Cultural Context
LING 4800	Language and Culture
<i>Approved Music Courses</i>	
MUEL 2772	World Musics: Asia and Oceania
MUSC 2772	World Musics: Asia and Oceania
MUSC 4112	Ethnomusicology
MUSC 4142	American Indian Music
<i>Approved Religious Studies Courses</i>	
RLST 2700	American Indian Religious Traditions
RLST 4300	Topics in Native American Religions
RLST 4353	Indigenous Traditions and Law: A Global Perspective
<i>Approved Women & Gender Studies Courses</i>	
WGST 3012	Women and Development
WGST 3210	American Indian Women
WGST 3672	Gender and the Global Economy

Total Credit Hours	18
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¹ Elective courses not taught by CNAIS core or affiliate faculty must be approved by the CNAIS director.

Public Health - Certificate

As the world becomes more interconnected, our communities and populations face increasingly complex health challenges emerging through the interaction of individual vulnerability and behavior, cultural and social factors, environmental and geographic influences as well as economic and political dynamics. Addressing these public health challenges requires innovative approaches arising from multiple disciplines.

The undergraduate certificate in public health encourages students to extend the breadth of their undergraduate education to include elements of public health. Students are encouraged to take courses from a variety of participating departments to develop an appreciation of the interdisciplinary nature of public health.

Requirements

The certificate requirements include a minimum of 18 credit hours (not to exceed 24) of course work, including at least 9 upper-division credit hours.

Required Courses and Credit Hours

Required Courses

GEOG 3692	Introduction to Global Public Health	
IPHY 3490	Introduction to Epidemiology	
<i>Required biology course:</i>		3
EBIO 1030	Biology: A Human Approach 1	
	or EBIO 1210 General Biology 1	
	or MCDB 1030 Introduction to Molecular Biology	
	or MCDB 1150 Introduction to Cellular and Molecular Biology	
<i>At least one of the following courses in statistics:</i>		3-4
ANTH 4000	Quantitative Methods in Anthropology	
	or APPM 2720 Open Topics in Lower Division Applied Mathematics	
	or APPM 4570 Statistical Methods	
	or BCOR 1020 Data Analysis in Business	
	or CHEN 3010 Applied Data Analysis	
	or EBIO 1010 Introduction to Quantitative Thinking for Biologists	
	or EBIO 4410 Biometry	
	or ECON 3810 Introduction to Statistics with Computer Applications	
	or GEOG 3020 Statistics for Geography	
	or IPHY 2800 Introduction to Statistics	
	or MATH 2510 Introduction to Statistics	
	or PSCI 2075 Quantitative Research Methods	
	or PSYC 211 Psychological Science I: Statistics	
	or SOCY 2061 Introduction to Social Statistics	

Electives

Six credit hours of primarily upper-division public health electives, at least one of which must be from outside of the student's major. 6

Biomedicine and Health

CHEM 4131	Chemistry of Global Health
EBIO 3400	Microbiology
EBIO 3630	Parasitology
IPHY 2420	Nutrition for Health and Performance
IPHY 3440	Clinical Nutrition
IPHY 2500	Perspectives in Health and Medicine
IPHY 3500	Applied Clinical Research
IPHY 4010	Seminar in Integrative Physiology
MCDB 3160	Pandemic! How the Genomics Revolution Can Save Us All
MCDB 4201	From Bench to Bedside: The Role of Science in Medicine

Global, Population and Environmental Health

ECON 4646	Topics in Health Economics
ENVS 3525	Intermediate Environmental Problem Analysis: Topical Cornerstones
ENVS 4800	Capstone: Critical Thinking in Environmental Studies
GEOG 3682	Geography of International Development
GEOG 4732	Population Geography

GEOG 4852	Health and Medical Geography
IAFS 3000	Special Topics in International Affairs
PSCI 4012	Global Development
SLHS 1010	Disabilities in Contemporary American Society
SOCY 4007	Global Human Ecology
<i>Medical Humanities</i>	
HIST 3416	Seminar in American Society and Thought
HIST 4326	Epidemic Disease in US History
PHIL 1160	Introduction to Bioethics
PHIL 3160	Bioethics
WRTG 3020	Topics in Writing
<i>Social, Cultural and Behavioral Health</i>	
ANTH 4060	Nutrition and Anthropology
ANTH 4610	Medical Anthropology
PSYC 3102	Behavioral Genetics
PSYC 4541	Special Topics in Psychology
SOCY 1022	Ethics and Social Issues in U.S. Health and Medicine
SOCY 3032	Social Epidemiology
SOCY 3042	Topics in Population and Health
SOCY 3052	Medical Sociology
SOCY 4052	Social Inequalities in Health
Total Credit Hours	12-13

Global Public Health is a track of the Public Health Certificate designed specifically for IAFS students. Students interested in pursuing the Global Public Health track of the Public Health Certificate can find additional information on the International Affairs Program (<http://www.colorado.edu/iafs/academics/certificates/global-public-health>) website.

Space - Minor

The space minor is part of the larger campus-wide Grand Challenge initiative and is open to all CU Boulder students regardless of major. The space minor is designed to provide all students enrolled in the minor with an over-arching background in all aspects of space through the required Pathway to Space (<https://www.colorado.edu/p1dfb9ae7d4d>) course. Course topics include:

- Space science and exploration
- Human spaceflight and life sciences
- Aeronautics and near space
- Launch and spacecraft systems
- Climate and environment
- Space business, policy and politics
- Space arts, media and history

Visit the Grand Challenge Space Minor (<http://www.colorado.edu/spaceminor>) website for more information.

Requirements

Completion of 15 credit hours (5 courses) is required for the minor, distributed as follows:

- ASEN 1969 – Pathway to Space (3 credit hours)

- Four approved elective courses (12 credit hours)

Requirements for the minor are met by completing the required ASEN 1969 Pathway to Space course and four approved electives from the list maintained on the Space Minor web site (<http://www.colorado.edu/spaceminor/space-minor-course-list>). NOTE: There may be restrictions on how many and/or which specific courses/credits can apply towards this minor as well as towards the student's degree program.

Three of the four elective courses must be completed at the CU Boulder campus. One elective course may be transferred from another institution with approval. A grade point average (GPA) of 2.000 or better is required for all courses used to satisfy the requirements for this minor. Each individual course that is counted towards these degree requirements must be passed with a D- or better. Note, however, that a C- or better is required in all prerequisite courses to move on to a subsequent course.

Education

The School of Education offers programs that prepare individuals to lead in a wide array of educational settings, including teaching in K–12 classrooms, conducting educational research, developing evidence-informed policy and designing innovative learning environments both in schools and in community-based settings.

Undergraduate students interested in K–6 Elementary Education may either pursue a Bachelor of Arts in Elementary Education (new for fall 2017) or complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. The school also provides teacher licensure programs that ensure rigorous content preparation and extensive clinical experience in local partner schools. Teacher licensure programs are available at the undergraduate, post-baccalaureate and master's level. The School of Education collaborates with the College of Arts & Sciences, College of Engineering and Applied Science, and the College of Music to design degree programs for undergraduates that combine a major in Arts & Sciences, Engineering and Applied Science, or Music with courses and field experiences in education that lead to a Colorado initial license.

The school offers a range of experiences and courses for undergraduates interested in educational issues, serving in the Peace Corps and/or working in community-based settings. Through the CU Engage program, the school offers undergraduates opportunities to participate in community-based research and programs. Undergraduate students pursuing a major in the College of Arts and Sciences with a bachelor's degree in either Social Sciences or Arts and Humanities can apply for a dual degree with a Bachelor of Arts in Leadership and Community Engagement. This option is available to undergraduate students pursuing a Bachelor of Arts in Anthropology, Political Science, Sociology, Ethnic Studies, Women and Gender Studies, Geography, English, Jewish Studies, Philosophy, Spanish & Portuguese, and Asian Studies. In addition, the school offers two undergraduate minors, one in education and one in leadership.

Graduate programs in the school serve practicing teachers as well as those seeking to improve education through rigorous research and evidence-informed policy and practice. The school's doctoral program is a cohort-based, full-time program that prepares individuals to lead in universities, research or policy institutes, state or government agencies and innovative non-profit organizations.

Mission

The School of Education is dedicated to inspiring and preparing educators, researchers and policy makers who understand and further the democratic foundations of education, who are committed to social justice, who seek to bring about greater equity and access in education and who will draw upon evidence-informed policy and practice to improve the quality of education in both Colorado and the world.

Accreditation

The licensure programs, both undergraduate and graduate, are fully accredited by the North Central Association of Colleges and Schools, the Council for Accreditation of Educator Preparation, the Colorado Department of Education and the Colorado Commission on Higher Education.

Policies & Requirements

Admission Requirements

Students may apply to one of the teacher education programs if the following requirements have been fulfilled:

1. **GPA:** Elementary and Secondary students must have and maintain a 2.75 (on a 4.00 scale) cumulative GPA, 2.75 at CU-Boulder, 2.75 in their subject area (secondary teacher fields) and 2.75 in education. K-12 Music Education students must have and maintain a 3.00 overall and in their subject area. Students applying to Master's Plus (MA+) programs must have and maintain a 3.00 cumulative GPA.
2. **Prior Degrees:** Students applying to Post-Baccalaureate and Master's Plus (MA+) programs must have a bachelor's degree from an accredited institution.
3. **Youth Experience:** Students must provide written verification of 25 clock hours of satisfactory experiences with elementary, middle/junior high or senior high school-aged youth (appropriate to the desired program) in the past five years. Forms for this purpose are available in the Office of Student Services, Education 151, or online at the School of Education (<http://www.colorado.edu/education/prospective-students>) website. Undergraduate students at CU Boulder meet this requirement through school experiences in EDUC 2020 Step 1: Inquiry Approaches to Teaching and EDUC 2050 Step into Humanities Teaching courses.
4. **Basic Skills:** All teacher education students must demonstrate basic skills competence in mathematics and literacy. This may be done through acceptable grades in appropriate college course work, or by acceptable standardized test scores. Contact the Office of Student Services in Education 151 for more information.
5. **Letters of Recommendation.**
6. **Personal Statement.**
7. **Background Check and Fee:** The School of Education and our partner districts require students working in schools to undergo background checks at least once per year. The costs and process for these background checks are changing due to new state requirements. Check with the Office of Student Services for the most updated information.
8. **Application Fee:** The appropriate application fee should be submitted with application materials. Fees vary by program.

Individuals interested in completing the teacher education program at the University of Colorado Boulder should request application materials from the Office of Student Services, Education 151 or online at the School

of Education (<http://www.colorado.edu/education>) website. Students currently enrolled in a degree program at Boulder will need to complete an application.

Individuals who have completed a baccalaureate degree at an accredited institution and are not currently enrolled at the university must complete a program application, a university application and submit official transcripts from all previous colleges directly to the University's Office of Admissions (<http://www.colorado.edu/admissions>).

Academic Excellence Scholarships and Awards

A limited number of scholarships and awards are available for second- and third-year students within the School of Education to support study at the master's and undergraduate levels. Each year a combination of teaching assistantships (TAs), research assistantships (RAs), other forms of graduate assistantships (GAs) and fellowships are available in the School of Education to support full-time doctoral study. The strongest doctoral applicants are nominated by the school for fellowships awarded by the Graduate School. Candidates apply in the spring semester for scholarships and awards for the following school year. Application procedures and deadlines are publicized on the School of Education website.

Students are eligible to apply for university-wide financial assistance through the Office of Financial Aid. State and federal programs are available for loan cancellation or forgiveness for Colorado teachers of certain subjects or who teach in designated schools serving students from low-income families. Information about these opportunities may be found at www.colorado.edu/education (<http://www.colorado.edu/education>).

Academic Standards

Upon enrollment in the Teacher Education Program, a student who fails to maintain a 2.75 GPA (3.00 for graduate students) will be placed on probation or may be suspended. Readmission is subject to program requirements in effect at the time of reapplication. The same conditions apply to students in other colleges and schools who have been admitted to the teacher education program.

Advising

Students are responsible for obtaining and reading the undergraduate student handbook (<http://www.colorado.edu/education/current-students/forms-policies>). Off-campus students may obtain advising materials online (<http://www.colorado.edu/education/prospective-students>) or by calling 303-492-6555.

At CU Boulder, degree requirements vary among the schools and colleges. Students seeking a degree at the University of Colorado should consult, as soon as possible, with an advisor in the college or school from which they expect to graduate and with the School of Education advisor (edadvise@colorado.edu).

Students are encouraged to become familiar with the teacher education requirements by comparing their own transcripts to the published advising materials. Students can then talk with an advisor before applying to the program or they may wait until after their applications are processed. Students seeking teacher licensure in French, German, Japanese, Latin, Russian, Spanish or music education should see the

designated advisor for that content area in addition to the School of Education advisor.

Advising may also be obtained through email (edadvise@colorado.edu). When requesting email advising, please make questions as specific as possible.

Programs of Special Interest CU Engage

The mission of CU Engage is to leverage the resources of the Boulder campus to work collaboratively with community groups to address complex public challenges. CU Engage, which is part of the School of Education, develops and sustains equity-oriented partnerships, organizes opportunities for students to learn alongside community members and supports participatory research methods focused on the public good.

CU Engage provides support for two focal activities: 1) community-based learning pathways and 2) community-based research. These activities are linked through the formation of community partnerships that support both learning and research. Community-based learning pathways—including INVST Community Studies, Public Achievement, CU Dialogues and the Leadership Studies Minor—prioritize experience (learning by doing), reciprocity (work with rather than for communities) and intellectual rigor rooted in academic disciplines. Community-based research refers to projects that bring people together with varied training and expertise, working collectively in mutually beneficial ways, on research studies that matter to the public.

Equity & Diversity Initiatives

As an important part of its mission, the CU Boulder School of Education has a strong commitment to democracy, diversity and social justice. Given that education is a cornerstone of individuals' life chances and opportunities as well as an informed and engaged public, the unwavering evidence of inequality in American education demands the sustained and dedicated attention of researchers, educators and policymakers.

Education Diversity Scholars Program

The Education Diversity Scholars (EDS) program works with the University of Colorado's LEAD Alliance Neighborhood to provide students of color and first-generation college students with social and academic support, as well as advising on financial support and career preparation. The goal of the program is to offer students a welcoming environment and a strong support network in order to help them excel in their chosen fields. By participating in the Education Diversity Scholars neighborhood, students have access to the personal contact and support of a small community while still being able to take advantage of the benefits of a large university.

INVST Community Studies

Consistent with their vision for a just and sustainable world, the INVST Community Studies program develops engaged citizens and leaders who work for the benefit of humanity and the environment. INVST Community Studies innovatively operates as a community-based organization, practicing service learning and participatory education. In order to fulfill this mission, the program offers:

- a comprehensive two-year Community Leadership Program (CLP) focused on developing community leaders who engage in compassionate action as a lifetime commitment;

- Community Studies electives that foster civic responsibility and leadership potential;
- a Public Achievement Program where CU undergrads coach local primary and secondary school students in the design and implementation of public action projects; and
- a Youth Council for Public Policy that empowers young people to use the democratic process as a tool for positive social change.

The INVST CLP offers a unique and transformational educational experience to all majors. Each year the INVST CLP admits a small group of students who are committed to making a positive difference with their lives. The two-year program is designed to cultivate deep understanding about issues facing people and the planet and to provide skills and experiences for community leaders to fulfill progressive visions for change. Specifically, students participate in theory classes, skills-training classes and two summer service-learning experiences, one domestic and one international. In addition, students intern six hours each week with community-based organizations during their first academic year, and collectively design, implement and evaluate community leadership projects during their second academic year. Students learn and serve together in a small group environment throughout the program. Applications for the INVST CLP are due every year in February.

Course code for this program is INVS.

STEM Initiatives

CU is a leader in Science Technology Engineering and Math (STEM) education. The School of Education, in collaboration with the College of Arts & Sciences, developed and is a national leader in the Learning Assistant model. Additionally, CU Boulder was one of the original 13 institutions selected to replicate the U Teach Model which started at the University of Texas, Austin. Both the LA and CU Teach programs help us prepare outstanding secondary math and science teachers.

The Learning Assistant (LA) Model at the University of Colorado-Boulder uses the transformation of large-enrollment science courses as a mechanism for achieving four goals:

- to recruit and prepare talented science majors for careers in teaching;
- to engage science faculty in the recruitment and preparation of future teachers;
- to improve the quality of science education for all undergraduates; and
- to transform departmental cultures to value research-based teaching for ourselves and for our students

The transformation of large-enrollment courses involves creating environments in which students can interact with one another, engage in collaborative problem solving and articulate and defend their ideas. To accomplish this, undergraduate LAs are hired to facilitate small-group interaction in our large-enrollment courses.

CU Teach is a four-year degree/licensure program that allows students to complete a rigorous education in a mathematics, science or engineering major and fulfill requirements for a Colorado initial teaching license in secondary mathematics or secondary science. It is a unique collaborative program between the College of Arts and Sciences, the College of Engineering and Applied Science, and the School of Education. CU Teach students get immediate hands-on K-12 teaching experience by enrolling in the first course in the program, Step 1: Inquiry Approaches to Teaching (EDUC 2020). Students can enroll in Step 1 as early as their freshman year at CU. In addition to taking courses from research faculty

in the School of Education, College of Arts and Sciences and College of Engineering and Applied Science, CU Teach students get support from Mentor Teachers (current K-12 teachers) and Master Teachers (CU faculty who are veteran classroom teachers). The student organization hosts activities and events that are social as well as service-oriented, and that help students develop career networks.

Programs of Study

Undergraduate students interested in K–6 Elementary Education may either pursue a Bachelor of Arts in Elementary Education (new for fall 2017) or complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. The school also provides teacher licensure programs that ensure rigorous content preparation and extensive clinical experience in local partner schools. Teacher licensure programs are available at the undergraduate, post-baccalaureate and master's level. The School of Education collaborates with the College of Arts & Sciences, the College of Engineering and Applied Science, and the College of Music to design degree programs for undergraduates that combine a major in Arts & Sciences, Engineering and Applied Science, or Music with courses and field experiences in education that lead to a Colorado initial license.

The school offers a range of experiences and courses for undergraduates interested in educational issues, serving in the Peace Corps and/or working in community-based settings. Through CU Engage, the school offers undergraduates opportunities to participate in community-based research and programs. Undergraduate students pursuing a major in the College of Arts and Sciences with a bachelor's degree can apply for a dual degree with a Bachelor of Arts in Leadership and Community Engagement. This option is available to undergraduate students pursuing a Bachelor of Arts in Anthropology, Asian Studies, English, Ethnic Studies, Geography, Jewish Studies, Philosophy, Political Science, Sociology, Spanish & Portuguese, and Women and Gender Studies. In addition, the school offers two undergraduate minors, one in Education and one in Leadership Studies.

Preparing the Teachers of Tomorrow

The School of Education prepares educators who are able to enact commitments to social justice and equitable access to deep content learning in school, family and community contexts.

The following principles guide our work in preparing the next generation of educators:

- Teachers must position students as sense-makers and knowledge-generators, who desire to invest and succeed in school. This involves noticing children/youth, building relationships with them, valuing their perspectives and attending to their thinking, curiosities and capabilities.
- Teaching is both intellectual work and a craft. Deep knowledge of content and pedagogy, creativity and passion fuel both learning and teaching.
- Teachers must design equitable learning environments in which all children are engaged in robust and consequential learning.
- Teacher's instruction and student learning is always conducted within the context of larger social systems, structures and hierarchies.
- What we do and say matters and must be analyzed. Our language and action constructs or constrains opportunities for children to build meaningful, positive and sustained relationships to learning and one another.

Course code for this program is EDUC.

Colorado Teacher Quality Standards

Teacher education candidates engage in a planned sequence of courses and accompanying clinical experiences in local community and school sites. Courses and assessments ensure candidates have demonstrated appropriate mastery of (1) content taught in the Colorado Academic Standards and (2) professional practices and dispositions associated with the Colorado Teacher Quality Standards listed below.

1. Teachers demonstrate mastery of and pedagogical expertise in the content they teach.
2. Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.
3. Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.
4. Teachers reflect on their practice.
5. Teachers demonstrate leadership.
6. Teachers take responsibility for student academic growth.

Bachelor's Degrees

- Elementary Education - Bachelor of Arts (BA) (p. 584)
- Leadership and Community Engagement - Bachelor of Arts (BA) (p. 589)

Minors

- Education (p. 595)
- Leadership Studies (p. 596)

Teacher Licensure Program

- Post-Baccalaureate (p. 600)
- Undergraduate Nondegree (p. 608)
- Master's Degree Plus (p. 1177) Secondary (p. 1177) Teacher Licensure Program (MA+) (p. 1177)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aiken, Ellen (https://experts.colorado.edu/display/fisid_103974)
PhD, University of Colorado Boulder

Anderson, Ronald
Professor Emeritus

Andrew, Julie Ann (https://experts.colorado.edu/display/fisid_148635)
Instructor; MEd, Univ of New South Wales (Australia)

Atteberry, Allison (https://experts.colorado.edu/display/fisid_154598)
Assistant Professor; PhD, Stanford University

Begley, Donna M (https://experts.colorado.edu/display/fisid_131000)
Senior Instructor

Boardman, Alison Gould (https://experts.colorado.edu/display/fisid_141887)
Asst Research Professor; PhD, University of Texas at Austin

Briggs, Derek Christian Mauthner (https://experts.colorado.edu/display/fisid_129597)
Professor; PhD, University of California-Berkeley

Bullington, Sam N (https://experts.colorado.edu/display/fisid_152528)
Lecturer

Cline, Ruth
Professor Emeritus

Dalton, Bridget Monroe (https://experts.colorado.edu/display/fisid_151711)
Associate Professor; EdD, Harvard University

Donato, Ruben (https://experts.colorado.edu/display/fisid_105537)
Professor; PhD, Stanford University

Dutro, Elizabeth (https://experts.colorado.edu/display/fisid_141157)
Professor; PhD, University of Michigan Ann Arbor

Escamilla, Kathy M (https://experts.colorado.edu/display/fisid_109224)
Professor; PhD, University of California-Los Angeles

Flexer, Roberta
Professor Emeritus

Furtak, Erin M (https://experts.colorado.edu/display/fisid_144504)
Associate Professor; PhD, Stanford University

Glass, Gene V (https://experts.colorado.edu/display/fisid_149833)
Research Professor; PhD, University of Wisconsin-Madison

Haas, John
Professor Emeritus

Hand, Victoria (https://experts.colorado.edu/display/fisid_144609)
Associate Professor; PhD, Stanford University

Hodge, Stephen
Professor Emeritus

Hoover, John J (https://experts.colorado.edu/display/fisid_113520)
Assoc Research Professor; PhD, University of Colorado Boulder

Hopewell, Susan Walsh (https://experts.colorado.edu/display/fisid_145039)
Assistant Professor; PhD, University of Colorado Boulder

Hopkins, Kenneth
Professor Emeritus

House, Ernie
Professor Emeritus

Jurow, Aachey Susan (https://experts.colorado.edu/display/fisid_129478)
Associate Professor; PhD, University of California-Berkeley

Kirshner, Benjamin R (https://experts.colorado.edu/display/fisid_134707)
Associate Professor; PhD, Stanford University

Kraft, Richard
Professor Emeritus

Lecompte, Margaret D.
Professor Emeritus

Linn, Robert L.
Professor Emeritus

Liston, Daniel P (https://experts.colorado.edu/display/fisid_102033)
Professor; PhD, University of Wisconsin-Madison

Lopez, Enrique J (https://experts.colorado.edu/display/fisid_151426)
Assistant Professor; PhD, Stanford University

McGinley, William (https://experts.colorado.edu/display/fisid_102195)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

McWilliams, Jenna Marie (https://experts.colorado.edu/display/fisid_155195)
Lecturer

Meens, David Eric (https://experts.colorado.edu/display/fisid_145241)
Lecturer

Meyer, Elizabeth Jackson (https://experts.colorado.edu/display/fisid_156354)
Associate Professor; PhD, McGill Univ (Canada)

Molnar, Alex John (https://experts.colorado.edu/display/fisid_148836)
Research Professor; MSW, University of Wisconsin-Milwaukee

Moses, Michele s (https://experts.colorado.edu/display/fisid_141025)
Professor; PhD, University of Colorado Boulder

Nogueron-Liu, Silvia (https://experts.colorado.edu/display/fisid_155783)
Assistant Professor; PhD, Arizona State University

O'Connor, Kevin C (https://experts.colorado.edu/display/fisid_148490)
Assistant Professor; PhD, Clark University

Otero, Valerie K (https://experts.colorado.edu/display/fisid_118377)
Professor; PhD, University of California-San Diego

Penuel, William Richard (https://experts.colorado.edu/display/fisid_149719)
Professor; PhD, Clark University

Polman, Joseph Louis (https://experts.colorado.edu/display/fisid_151296)
Professor; PhD, Northwestern University

Ramirez, Karen E. (https://experts.colorado.edu/display/fisid_116951)
Instructor; PhD, University of Illinois at Urbana-Champaign

Shapiro, Ryan Benjamin (https://experts.colorado.edu/display/fisid_156418)
Assistant Professor; PhD, Northwestern University

Shepard, Lorrie A (https://experts.colorado.edu/display/fisid_105949)
Distinguished Professor; PhD, University of Colorado Boulder

Sideris, Sabrina C (https://experts.colorado.edu/display/fisid_120493)

Soltero-Gonzalez, Lucinda A (https://experts.colorado.edu/display/fisid_144617)
Lecturer; PhD, University of Arizona

Stillman, Jamy A (https://experts.colorado.edu/display/fisid_156381)
Associate Professor; PhD, University of California-Los Angeles

Taylor, Edward Vincent (https://experts.colorado.edu/display/fisid_151510)

Assistant Professor; PhD, University of California-Berkeley

Webb, David C. (https://experts.colorado.edu/display/fisid_141204)
Associate Professor; PhD, University of Wisconsin-Madison

Welner, Kevin G (https://experts.colorado.edu/display/fisid_115565)
Professor; PhD, University of California-Los Angeles

White, Terrenda Corisa (https://experts.colorado.edu/display/fisid_152828)
Assistant Professor; PhD, Teachers College at Columbia University

Willmann, Kent D (https://experts.colorado.edu/display/fisid_148075)
Instructor

Wilson, Terri Suzanne (https://experts.colorado.edu/display/fisid_155469)
Assistant Professor; PhD, Columbia University Central office

Courses

Education

EDUC 1500 (1) Success Strategies in Higher Education

Introduces students to learning theories and a range of college success strategies to deepen their engagement with their academic work. Students will learn metacognitive practices to identify the values and aims driving their academic ambitions and craft their most successful path through their undergraduate experience.

Repeatable: Repeatable for up to 2.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Education

EDUC 1580 (3) Energy and Interactions

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1580

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: General Education

EDUC 2020 (1) Step 1: Inquiry Approaches to Teaching

Invites science, mathematics and engineering students to explore teaching as a career by providing first-hand experiences teaching science/math lessons in local elementary classrooms. Introduces theory and practice necessary to design and deliver excellent instruction. Master teachers provide ongoing support and feedback. Meets weekly on CU campus (1.5 hours/week) and involves five visits to an elementary school.

Requisites: Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, AS Open Option majors, College of Engineering majors, Education minors, EDEL, EDMU, EDEN, EDMA, EDSC, EDSS, EDFR, EDGR, EDLT, EDRO or EDSP majors only.

Additional Information: Departmental Category: General Education

EDUC 2025 (1) Step 1: Inquiry Approach to Teaching in Informal Settings

Invites science, mathematics and engineering students to explore teaching and learning in informal K-12 environments. Introduces theory and practice necessary to design and deliver excellent instruction. Meets weekly on CU campus (1.5 hours/week) and requires participants to work a minimum of five hours with K-12 students at STEM-related special events such as science fairs, after school programs, and science camps.

Requisites: Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, College of Engineering majors, or Education minors only.

Additional Information: Departmental Category: General Education

EDUC 2030 (1-2) Step 2: Inquiry-Based Lesson Design

Builds on EDUC 2020 and further develops lesson design and inquiry-based teaching practice. Offers opportunity to explore teaching career and learn about middle school culture. Master teacher provides support as students design and deliver lessons in middle school classrooms. Emphasizes assessment of student learning. Meets weekly on CU campus (1.5 hours/week) and involves five visits to a local middle school.

Requisites: Prereq course of EDUC 2030 (min grade C-). Rstr to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, AS Open Option majors, ENGR majors, EDUC minors, EDEL, EDMU, EDEN, EDMA, EDSC, EDSS, EDFR, EDGR, EDLT, EDU or EDSP.

Additional Information: Departmental Category: General Education

EDUC 2050 (1) Step into Humanities Teaching

Invites students in humanities and social sciences to explore teaching as a career by providing first-hand experiences working with children. Introduces theory and practice for the design of text-based, equity-focused instruction. Students receive support and feedback from experienced educators. Meets weekly on CU campus (1.25 hours/week). Requires additional time at a practicum site.

Additional Information: Departmental Category: General Education

EDUC 2125 (3) History of American Public Education

Provides an overview of the history of American education by exploring major reforms efforts from the common school movement to "Nation at Risk." Examines what intellectuals were thinking about public schools and what ordinary people experienced in them. Assesses how differences in race/ethnicity, class, gender, and power shaped public schools.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: General Education

EDUC 2150 (3) Education in Film

Provides opportunities to view and analyze how facets of education are represented (or misrepresented) in film. Considers narratives constructed about education and how those stories fuel popular conceptions of and assumptions about students, teachers, and schools. Examines how issues of race, class, and gender are embedded in how films represent schools, teachers, students, and communities.

Additional Information: Departmental Category: General Education

EDUC 2400 (3) Cultural Diversity and Awareness

Enhances students' self-awareness in a variety of educational and cultural settings. Investigates self within a cultural context, inviting students to engage more deeply with their cultural assumptions and lenses, as well as the cultural practices and beliefs of other distinct groups. Explores themes relating to diversity through works of fiction, cultural contexts, contemplative practices, poetry, music and experiential activities.

Additional Information: Departmental Category: General Education

EDUC 2625 (3) Teaching English as a Second Language

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

Additional Information: Departmental Category: General Education

EDUC 2800 (1-3) Special Topics

Designed to meet needs of students with topics of interest.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: General Education

EDUC 2910 (1-3) Field Practicum 1

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2920.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 2919 (3) Renewing Democracy in Communities and Schools

Examines curriculum theory, K-12 reform, and the concepts of citizenship, democracy, power, and diversity through classroom discussion and participation in a school-based Public Achievement program. Students will dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

Equivalent - Duplicate Degree Credit Not Granted: INVS 2919

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General Education

EDUC 2920 (1-3) Field Practicum 2

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2910.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 3013 (3) School and Society

Introduces students - both future teachers and those simply interested in education - to pressing issues surrounding education within the United States. The course reveals the complex relationship between schools and the larger society of which they are a part. Examines issues of diversity and equity from different disciplinary lenses, including history, philosophy, sociology and anthropology.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Contemporary Societies
Departmental Category: General Education

EDUC 3570 (3) Learning With Technology In and Out of School

Examines ways digital media are changing the way young people learn, play, make friends, and participate in civic life. Studies widely implemented digital tools intended to support literary, math, and science learning of children ages 4-18. Involves brief internship (5 hours outside class) and design projects that integrate these tools to transform in either a classroom or after-school program.

Additional Information: Departmental Category: General Education

EDUC 3621 (1-3) Art for the Elementary Teacher

Introduces elementary education students to art education. Introduces many visual art techniques, art media and processes used in art education. Includes hands-on studio art experiences in a format that supports subjects such as literature, writing, music and social studies. Emphasizes the role of art education and materials in supporting the artistic development and visual literacy of children. Department enforced prerequisite: completion of 30 hours of course work.

Requisites: Restricted to School of Education (EDUC) undergraduates only

Additional Information: Departmental Category: Elementary Education

EDUC 4015 (3) International / Comparative Education

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace corps and Volunteer Agencies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5015

Additional Information: Departmental Category: General Education

EDUC 4023 (3) Differentiating Instruction in Diverse Secondary Classrooms

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning. Includes practicum.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4351

Requisites: Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4050 (3) Knowing and Learning in Mathematics and Science

Explores current theories of learning in mathematics and science at the secondary level. This course focuses on learners' opportunities to learn mathematics and science in a classroom context from the perspective of different theoretical orientations. Students examine their own assumptions about learning, and critically examine the needs of a diverse student population in the classroom.

Requisites: Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, College of Engineering majors, or Education minors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4060 (3) Classroom Interactions

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts. Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5060

Requisites: Restricted to School of Education (EDUC), Mathematics-Secondary Education (EDMA) or Science-Secondary Education (EDSC) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4112 (3) Educational Psychology and Adolescent Development

Analyzes fundamental concepts from psychology and the learning sciences to understand how educators can support youth development in and out of school. Includes service learning requirement.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4114

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Secondary Education

EDUC 4125 (3) Secondary World Language Methods

Presents and discusses issues in secondary school curriculum, instruction, and classroom management as they play out in world language classroom. Examines, analyzes, and evaluates a variety of teaching strategies, their effectiveness for students, and teacher dispositions to facilitate learning. Includes in-school experiences.

Requisites: Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4135 (3) Story and Memoir

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5135

Additional Information: Departmental Category: Secondary Education

EDUC 4161 (1-3) Children's Literature

Addresses reading and evaluation of books, children's, interests, authors and illustrators, folk literature, multicultural literature, modern fanciful tales, and trends.

Additional Information: Departmental Category: General Education

EDUC 4222 (3) Language Study for Educators

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5222

Additional Information: Departmental Category: General Education

EDUC 4232 (3) Language and Literacy across the Curriculum

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5235

Requisites: Restricted to undergraduate Science-Secondary Education (EDSC) or Mathematics-Secondary Education (EDMA) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4295 (4) Reading and Literacy in the Secondary Classroom

Examines ways in which adolescents develop literacy through reading, writing, speaking, viewing, and listening. Students learn to plan and organize literacy instruction based on ongoing assessment, to draw on and develop learner's linguistic skills related to reading, to support learner's reading comprehension skills, and to support their learning through oral language development.

Requisites: Requires a corequisite course of EDUC 4342 or EDUC 5345. Restricted to undergraduate English - Secondary Education (EDEN) or English - Secondary Education (EDSS) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4311 (3) Children's Literature and Literacy Engagement in Elementary Schools

Focuses on teaching children's literature in elementary schools & youth organizations. Participants will understand theoretical and developmental processes associated with literary learning, methods for teaching literature in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

Requisites: Restricted to Elementary Education (EDEL) or Education (EDUC-MIN) students only.

Additional Information: Departmental Category: Elementary Education

EDUC 4312 (3) Perspectives on Science

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5315

Additional Information: Departmental Category: General Education

EDUC 4318 (3) The Nature of "English Language Arts

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for 21st century literacies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5318

Additional Information: Departmental Category: General Education

EDUC 4320 (3) Reading Instruction for Elementary Schools

Participants will engage theories and processes of literacy learning, reading development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of print and multimodal literacy practices embedded in reading instruction in elementary classrooms.

Requisites: Requires corequisite course of EDUC 4321. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4321 (3) Writing Instruction for Elementary Schools

Participants will engage theories and processes of literacy learning, writing development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of multimodal literacy practices embedded in writing instruction in elementary classrooms.

Requisites: Requires corequisite course of EDUC 4320. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4331 (3) Elementary Social Studies Methods

Prepares teacher education candidates for teaching social studies in a social justice and equity context. Participants will understand theoretical and developmental processes associated with social studies learning, culturally responsive teaching pedagogy in social studies, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards.

Requisites: Requires corequisite courses of EDUC 5215 and EDUC 4341. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4341 (3) Elementary Reading Assessment and Instruction

Builds on knowledge and teaching practices introduced in EDUC 4320. Addresses five critical components of reading. Refines understanding of research-based practices for diagnostic assessments and intervention, and teaching strategies for elementary age learners. Prepares candidates to deliver a comprehensive reading curriculum in the elementary grades.

Requisites: Requires corequisite courses of EDUC 4331 and EDUC 5215. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4342 (3) Writing in Humanities Classrooms

Fosters understandings of diverse students' writing processes and the development of a repertoire of research-based teaching practices. Emphasizes writing as a tool for both developing and communicating understandings across a range of settings.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5345

Requisites: Requires a corequisite course of EDUC 4295 or EDUC 5295. Restricted to English - Secondary Education (EDEN) or English - Secondary Education (EDSS) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4351 (3) Differentiating Instruction in Diverse Elementary Classrooms

Focuses on differentiating and individualizing instruction for elementary school students including culturally, linguistically and ability diverse students. Includes theoretical and practical orientations to planning instruction and assessment as well as providing information regarding teachers' and families' legal rights and responsibilities. Includes hands-on experiences in elementary school settings.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4023

Requisites: Requires corequisite course of EDUC 5205. Restricted to Music (EDMU) Education majors or Elementary (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4411 (3-4) Educational Psychology for Elementary Schools

Integrates theories and ideas from elementary school child development, educational psychology and the learning sciences. Explores theories of learning and child development and considers implications for teaching, student engagement and the design of equitable and effective learning environments. Students are required to attend a practicum off-site for this class.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: General Education

EDUC 4425 (3) Introduction to Bilingual/Multicultural Education

Provides a comprehensive survey of bilingual-multicultural education programs for language minority students. Includes an overview of the history and legislation related to bilingual education and English as a second language. Presents various models, philosophies, and theoretical underpinnings of bilingual education and ESL.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5425

Additional Information: Departmental Category: General Education

EDUC 4460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5460 and PHYS 4460 and PHYS 5460

Requisites: Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 4513 (2) Education and Practice

Meets during student teaching assignment. Includes topics of concern to teachers, such as classroom organization and management, lesson planning, assessment, preparation of edTPA, etc.

Requisites: Requires corequisite course of EDUC 4691 or 4712 or 4722. Restricted to EDEL, EDEN, EDFR, EDGR, EDJP, EDLT, EDMA, EDRU, EDSC, EDSP or EDSS majors only.

Additional Information: Departmental Category: General Teacher Education

EDUC 4610 (2-3) Math and Science Education

Introduces learning theory and teaching practices for mathematics and science learning assistants. Presents theoretical issues such as conceptual development, questioning techniques, cooperative learning, nature of math/science and argumentation in mathematics and science. Department enforced prerequisite: students admitted to the Learning Assistant program.

Additional Information: Departmental Category: General Education

EDUC 4691 (10) Student Teaching: Elementary School 1

Kindergarten through sixth grades. Department enforced prerequisite: completion of all education and content-specific arts and sciences requirements, and passing required licensure exam.

Requisites: Requires corequisite course of EDUC 4513. Restricted to Elementary Education (EDEL-LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4712 (10) Student Teaching: Secondary School

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

Requisites: Requires corequisite course of EDUC 4513. Restricted to EDEN, EDJP, EDLT, EDMA, EDRU, EDSC or EDSS (LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4716 (3) Basic Statistical Methods

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

Additional Information: Departmental Category: General Education

EDUC 4722 (5) Student Teaching: Secondary School 2

Student teacher apprentices in a middle/junior high or senior high school. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

Requisites: Requires corequisite course of EDUC 4513. Restricted to EDFR, EDGR or EDSP (LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4732 (4-12) Student Teaching K-12

Required experience for music students seeking education at both elementary and secondary levels. Department enforced prerequisites: completed all education and content-specific music courses and passed required licensure exam.

Requisites: Requires corequisite course of MUSC 4193. Restricted to EDMU (LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4742 (9) Student Teaching: Secondary for Engineers

Student teacher apprentices in a middle/junior or senior high school.

Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

Requisites: Requires a prerequisite course of EDUC 4513 or EDUC 4050 (minimum grade C-). Restricted to EDMA or EDSC majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Secondary Education

EDUC 4800 (1-9) Special Topics

Designed to meet needs of students with topics of pertinent interest.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 4810 (1-9) Special Topics

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 4811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6811 and MCDB 4811 and MCDB 5811

Additional Information: Departmental Category: Graduate Education

EDUC 4822 (3) Teaching and Learning Chemistry

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology, and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

Requisites: Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

Additional Information: Departmental Category: General Education

EDUC 4831 (3) Advanced Peer Education

Second semester of an academic year's training for students interested in peer counseling. Expand upon what you learned in ARSC 2274. Focus on presentations, leadership, and group facilitation. Basic group leadership, facilitation theory, and technique taught. Co-create and co-lead your own small groups/presentations for other CU students. Offered only spring semesters.

Requisites: Requires prerequisite course of ARSC 2274 (minimum grade D-).

Additional Information: Departmental Category: General Education

EDUC 4833 (3) Teaching and Learning Earth Systems

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). Focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions, and developing effective discourse within and outside the classroom.

Requisites: Requires prerequisite course of ATOC 1060 or ENV5 1000 or GEOL 1010 or GEOL 1020 or GEOL 1060 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Teacher Education

EDUC 4840 (1-4) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 4910 (3) Peer Counseling Practicum

Controlled enrollment. Credit given for peer counseling activities. Students are selected to participate in this class and act as peer counselors or TAs for the peer counseling training. Repeatable up to 9 total credit hours.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: General Education

EDUC 4912 (1) Practicum in Teacher Education

Provides in-school practicum experience.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

INVST Community Studies**INVS 1000 (4) Responding to Social and Environmental Problems Through Service Learning**

By integrating theory with required community service, students explore how problems are shaped by cultural values and how alternative value paradigms affect the definition of problems in areas such as education and the environment. Students examine different approaches to solving problems and begin to envision new possibilities.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Departmental Category: Invst Community Studies

INVS 1513 (3) Civic Engagement: Using the Electoral Process as a Tool for Social Change

Designed to educate and inspire civic engagement primarily in the area of electoral politics. Examines various explanations of why people participate in the electoral process and whom they choose to support. Develops the practical skills necessary to participate successfully in the electoral arena. Through a service component, the course provides experience working on a campaign and mobilizing others to participate in the electoral process.

Additional Information: Departmental Category: Invst Community Studies

INVS 1523 (3) Civic Engagement: Democracy as a Tool for Social Change

Educates and inspires students for civic engagement by exploring democratic values and the rights and responsibilities of citizenship. Develops theoretical knowledge and practical skills for participating in a diverse democratic society, especially at the state level, through analyzing legislative issues, making policy recommendations, and advocating for change.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: United States Context

Departmental Category: Invst Community Studies

INVS 2005 (2) Puksta Scholars Practicum

Integrates critical reflection and community-based experiences for undergraduates in the Puksta Scholars Program. This two-semester course will focus on the development of knowledge, attitudes and skills to productively engage the public realm. Examines topics includes ethical leadership, frameworks for social action, project design and participatory action research.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

INVS 2919 (3) Renewing Democracy in Communities and Schools

Examines concepts of activism, citizenship, democracy, power, and diversity through classroom discussions and participation in a local K-12 school's Public Achievement project. Through community-based partnerships, students will develop leadership skills; dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 2919

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Invst Community Studies

INVS 3000 (3-4) Innovative Approaches to Contemporary Issues through Service Learning

Explores creative approaches for solving complex social and environmental issues, with a focus on peace and population. Students analyze the root causes of issues in theoretical and historical contexts, and develop their understanding of effective and innovative approaches to change. This course has a requirement of community service.

Recommended: Requisite upper-division status.

Additional Information: Arts Sci Core Curr: Contemporary Societies

Departmental Category: Invst Community Studies

INVS 3041 (3) Self and Consciousness

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3041

Requisites: Requires prerequisite courses of SOCY 1001 and SOCY 3001 or SOCY 3011 (all minimum grade D-).

Additional Information: Departmental Category: Invst Community Studies

INVS 3100 (3-4) Multicultural Leadership: Theories, Principles and Practices

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of Western and non-Western theories and practices. Community service required.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3201

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Invst Community Studies

INVS 3302 (3) Facilitating Peaceful Community Change

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3302

Additional Information: Departmental Category: Invst Community Studies

INVS 3402 (3) Implementing Social and Environmental Change

Examines grassroots innovation as a means for creating comprehensive, solution-based strategies to address social and environmental problems. Students develop an understanding of the root causes of problems, identify how changes are initiated at the grassroots level, and learn the theory and practice of effective and responsible change efforts.

Additional Information: Departmental Category: Invst Community Studies

INVS 3931 (3) The Community Leadership Internship, Part 1

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, admission into INVST CLP.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Invst Community Studies

INVS 3932 (3) Community Leadership Internship, Part 2

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, membership in INVST CLP.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of INVS 3931 (minimum grade D-).

Additional Information: Departmental Category: Invst Community Studies

INVS 4302 (3) Critical Thinking in Development

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade, and democratization.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 4732

Requisites: Requires prerequisite courses of PSCI 2012 or IAFS 1000 and ECON 2010 and 2020 (all minimum grade D-).

Recommended: Prerequisite one upper-division PSCI course.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Invst Community Studies

INVS 4402 (3) Nonviolent Social Movements

Explores theories of democracy and development in relation to movements for nonviolent social change. Focuses on means and ends, spirituality, leadership, decision-making, civil society, cooperative economics, ecology and decentralized powers.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Sociology (SOCY) or Political Science (PSCI) majors only.

Additional Information: Departmental Category: Invst Community Studies

INVS 4919 (1-2) Teaching Social Justice for Public Achievement

Participate as teaching assistants for the practicum course INVS 2919. Focusing on the issues of democratic education, diversity, social justice and social change, students learn how to foster undergraduates' skills as experiential educators.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of INVS 2919 (minimum grade B).

INVS 4931 (1-6) Community Leadership in Action, Part 1

Develops students' expertise as community leaders. Under the supervision of an instructor and a community advisor, students design a community-based project.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of INVS 3931 and INVS 3932 (all minimum grade D-).

Recommended: Prerequisite admission to INVST CLP.

Additional Information: Departmental Category: Invst Community Studies

INVS 4932 (1-6) Community Leadership in Action, Part 2

Develops students' expertise as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community advisor, students learn organizational and leadership skills by designing, implementing and evaluating a community-based project. First-hand experience provides students with a deepened understanding of the complex issues facing humanity, and competence with solution-based strategies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of INVS 4931 (minimum grade D-).

Additional Information: Departmental Category: Invst Community Studies

INVS 4999 (1-4) Teaching Social Justice

Students participate in a service-learning practicum under the supervision of a Community Studies instructor. They explore teaching strategies for implementing concrete educational goals. Focusing on the issues of social justice and social change, they learn how to encourage higher levels of creativity and analysis among students.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Invst Community Studies

LEAD**LEAD 1000 (3) Becoming a Leader**

The foundation course will prepare students to exercise leadership in business, government and community organizations. Introduces leadership skills useful in a variety of settings including community and civic activities. Helps students to improve self awareness, understand multiple theories, recognize moral courage, build analytic and critical thinking skills and adapt leadership practices to different people and contexts.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 3030

Additional Information: Departmental Category: CU Engage

LEAD 4000 (4) Leadership in Context and Emerging Challenges: A Capstone

Integrates leadership topics and experiences students pursued through the Leadership Studies Minor. Using advanced critical thinking skills, the seminar requires students to evidence their knowledge, competencies and skills related to leadership theory and practice through examining contemporary leadership challenges. Further, the seminar directs students to justify decision-making processes, demonstrating their ability to synthesize prior knowledge to effect desirable, ethical outcomes.

Requisites: Requires a prerequisite course of LEAD 1000 or LDSP 1000 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: CU Engage

Elementary Education - Bachelor of Arts (BA)**Elementary Education - Bachelor of Arts (BA)**

If you are interested in a rewarding career as an elementary teacher, the BA in Elementary Education with the endorsement in Culturally and Linguistically Diverse (CLD) Education provides an efficient and rigorous path. We prepare teachers who are committed to ensuring every student learns and excels.

You will gain experience through coursework and extensive, hands-on experience in the classroom. This degree offers a path towards teacher licensure plus the advanced CLD endorsement, which provides preparation and tools for working with diverse populations and English language learners, an area of high demand in education. Please note if you are interested in a degree in another area combined with licensure, visit our existing teacher licensure program (p. 598).

To learn more, contact our advisors at 303-492-6555 or edadvise@colorado.edu. To apply, visit the CU Boulder Admissions website (<http://www.colorado.edu/admissions>).

Bachelor of Arts in Elementary Education - Degree Plan

Course	Title	Credit Hours
Year One		
Fall Semester		
EDUC 2020	Step 1: Inquiry Approaches to Teaching	1
EDUC 3013	School and Society	3
LEAD 1000	Becoming a Leader	3
Elementary Core Requirement		3
Elementary Core Requirement Taking a Natural Science course with lab in the first semester is strongly recommended		4
		Credit Hours
		14
Spring Semester		
EDUC 2020	Step 1: Inquiry Approaches to Teaching	1
INVS 2919	Renewing Democracy in Communities and Schools	3
Elementary Core Requirement		3
		Credit Hours
		16
Year Two		
Fall Semester		
EDUC 4311	Children's Literature and Literacy Engagement in Elementary Schools	3
Elementary Core Requirement		3
		Credit Hours
		15
Spring Semester		
EDUC 2625	Teaching English as a Second Language	3
EDUC 4411	Educational Psychology for Elementary Schools	4
Elementary Core Requirement		3
Elementary Core Requirement		3

Elective		3
	Credit Hours	16
Year Three		
Fall Semester		
EDUC 4320	Reading Instruction for Elementary Schools	3
EDUC 4321	Writing Instruction for Elementary Schools	3
EDUC 4425	Introduction to Bilingual/Multicultural Education	3
EDUC 4xxx Second Language Acquisition		3
Elementary Core Requirement		3
	Credit Hours	15
Spring Semester		
EDUC 4xxx Elementary Mathematics Theory and Methods		3
EDUC 4351	Differentiating Instruction in Diverse Elementary Classrooms	3
EDUC 4xxx Methods and Materials in Bilingual/Multicultural Education		3
EDUC 4xxx Literacy for Linguistically Different Learners		3
EDUC 4xxx Practicum in Linguistically Different: English as a Second Language		3
	Credit Hours	15
Year Four		
Fall Semester		
EDUC 4331	Elementary Social Studies Methods	3
EDUC 4341	Elementary Reading Assessment and Instruction	3
EDUC 4xxx Elementary Science Theory and Methods		3
EDUC 4xxx Proseminar: Parent and Community Involvement		3
EDUC 4xxx Diagnostic Testing in ESL and Bilingual Education		3
EDUC 4xxx Advanced Practicum in Multicultural, Bilingual, and ESL Education		2
	Credit Hours	17
Spring Semester		
EDUC 4513	Education and Practice	2
EDUC 4691	Student Teaching: Elementary School 1	10
	Credit Hours	12
	Total Credit Hours	120

Elementary Core Requirements

Minimum Required Credit Hours

1. Quantitative Reasoning and Mathematical Skills	4
2. Natural Sciences: As indicated below	7
Biological Science: 3 credit hours	
Physical Science: 3 credit hours	
Lab: At least one credit hour of an associated lab. The lab may be either a biological or physical science.	
3. Written Communication: 3 credits must be upper-division	6
4. World Historical Context	3
5. US Historical Context	3
6. Literature and Arts	3
7. Cultural Geography	3
8. American Government	3
9. Ethics	3
10. Public Speaking	3
Total Credit Hours	38

1. Quantitative Reasoning and Mathematical Skills (4-6 credits)

MATH 1110 & MATH 1120	Mathematics for Elementary Educators 1 and Mathematics for Elementary Educators 2	6
MATH 1300	Calculus 1	5
MATH 1310	Calculus, Systems, and Modeling	5
APPM 1350	Calculus 1 for Engineers	4

2. Natural Science (7 credits)

The Natural Science requirement consists of three credit hours of a biological science, three credit hours of a physical science, and at least one credit hour of an associated lab. The lab may be either a biological or physical science.

Biological Science

Choose from:		
ANTH 2010	Introduction to Biological Anthropology 1	3
ANTH 3000	Primate Behavior	3
ANTH 3010	The Human Animal	3
EBIO 1030	Biology: A Human Approach 1	3
EBIO 1210	General Biology 1	3
EBIO 3180	Global Ecology	3
IPHY 2420	Nutrition for Health and Performance	3
IPHY 3660	Dynamics of Motor Learning	3
MCDB 1030	Introduction to Molecular Biology	3
MCDB 1150	Introduction to Cellular and Molecular Biology	3
MCDB 3150	Biology of the Cancer Cell	3

Physical Science

Choose from:		
AREN 2110	Thermodynamics	3
ASTR 1000	The Solar System	3
ASTR 1010	Introductory Astronomy 1	4
ASTR 1030	Accelerated Introductory Astronomy 1	4
ASTR 1200	Stars and Galaxies	3
ASTR 2000	Ancient Astronomies of the World	3

ASTR 2010	Modern Cosmology-Origin and Structure of the Universe	3	ENVS 1150	First-Year Writing in Energy, Environment and Sustainability	3
ASTR 2020	Space Astronomy and Exploration	3	IPHY 1950	Introduction to Scientific Writing in Integrative Physiology	3
ASTR 2030	Black Holes	3	PHIL 1500	Reading, Writing and Reasoning	3
ASTR 2040	The Search for Life in the Universe (Cross-listed with GEOL 2040)	3	WRTG 1100	Extended First-Year Writing and Rhetoric	4
ATOC 1050	Weather and the Atmosphere	3	WRTG 1150	First-Year Writing and Rhetoric	3
ATOC 3050	Principles of Weather	3	WRTG 1250	Advanced First-Year Writing and Rhetoric	3
ATOC 3070	Introduction to Oceanography (Cross-listed with GEOL 3070)	3	Upper Division Courses		
CHEM 1011	Environmental Chemistry 1	3	ARSC 3100	Multicultural Perspective and Academic Discourse	3
CHEM 1021	Introductory Chemistry	4	CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization (Cross-Listed with JPNS 3200)	3
CHEM 1113	General Chemistry 1	4	EBIO 3940	Written Communication in the Sciences	3
CHEM 1400	Foundations of Chemistry	4	ENVS 3020	Advanced Writing in Environmental Studies	3
EDUC 1580	Energy and Interactions (Cross-Listed with PHYS 1580)	3	GEOL 3090	Developing Scientific Writing Skills	3
ENVS 3070	Energy and the Environment (Cross- Listed with PHYS 3070)	3	HIST 3020	Historical Thinking & Writing	3
GEOG 1001	Environmental Systems: Climate and Vegetation	4	HONR 3220	Advanced Honors Writing Workshop	3
GEOL 1010	Introduction to Geology	3	ITAL 3025	Advanced Composition 2: Introduction to Literary Writing	3
GEOL 2100	Environmental Geology	3	IPHY 3700	Scientific Writing in Integrative Physiology	3
GEOL 3040	Global Change: The Recent Geological Record	3	PHIL 3480	Critical Thinking/Writing in Philosophy	3
PHYS 1010	Physics of Everyday Life 1	3	PHYS 3050	Writing in Physics: Problem-Solving and Rhetoric	3
PHYS 1110	General Physics 1	4	RLST 3020	Advanced Writing in Religious Studies	3
PHYS 1230	Light and Color for Nonscientists	3	SOCY 4010	Sociology Capstone Course: Professional Writing	3
PHYS 1240	Sound and Music	3	SPAN 3010	Advanced Rhetoric and Composition	3
PHYS 2010	General Physics 1	5	WRTG 3007	Writing in the Visual Arts	3
PSYC 2012	Biological Psychology	3	WGST 3800	Advanced Writing in Feminist Studies	3
SLHS 2010	Science of Human Communication	3	WRTG 3020	Topics in Writing (Cross-listed with NRLN 3020)	3
			WRTG 3030	Writing on Science and Society	3
			WRTG 3035	Technical Communication and Design	3
			WRTG 3040	Writing on Business and Society	3

Lab

Choose from:

Each course below has either a pre-requisite or co-requisite lecture.

ANTH 2030	Laboratory in Biological Anthropology 1	1
ATOC 1070	Weather and the Atmosphere Laboratory	1
CHEM 1114	Laboratory in General Chemistry 1	1
CHEM 1401	Foundations of Chemistry Lab	1
EBIO 1050	Biology: A Human Approach Laboratory	1
EBIO 1230	General Biology Laboratory 1	1
GEOL 1030	Introduction to Geology Laboratory 1	1
MCDB 1043	Exploring Genetics Laboratory	1
MCDB 1151	Introduction to Cell and Molecular Biology Lab	1
PHYS 1140	Experimental Physics 1	1

3. Written Communication (6 credits – 3 credits must be upper-division)**Lower Division Courses**

ARSC 1080	College Writing and Research	4
ARSC 1150	Writing in Arts and Sciences	3
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World	3
EBIO 1940	College Writing for Science Students	3
ENGL 1001	Freshman Writing Seminar	3

4. World Historical Context (3 credits)

ANTH 1180	Maritime People: Fishers and Seafarers	3
ANTH 1190	Origins of Ancient Civilizations	3
ANTH 2200	The Archaeology of Human History	3
ANTH 3009	Modern Issues, Ancient Times (Cross-listed with CLAS 3009)	3
ARAB 3230	Islamic Culture and the Iberian Peninsula	3
ARTH 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World (Cross-listed with CLAS 1509)	4
CEES 1626	Introduction to Central and East European History since 1770 (Cross-listed with HIST 1626)	3
ARTH 3019	Pompeii and the Cities of Vesuvius	3
CLAS 1051	The World of the Ancient Greeks (Cross-listed with HIST 1051)	3
CLAS 1061	The Rise and Fall of Ancient Rome (Cross-listed with HIST 1061)	3
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World	3
ECON 4514	Economic History of Europe	3
ENGL 3164	History and Literature of Georgian Britain	3
ENGL 4113	History and Culture of Medieval England	3

GRMN 2301	Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich	3
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600	3
HIST 1018	Introduction to Early Latin American History to 1810	3
HIST 1012	Empire, Revolution and Global War: European History Since 1600	3
HIST 1028	Introduction to Modern Latin American History since 1800	3
HIST 1113	Introduction to British History to 1660	3
HIST 1123	Introduction to British History Since 1660	3
HIST 1218	Introduction to Sub-Saharan African History to 1800	3
HIST 1228	Introduction to Sub-Saharan African History Since 1800	3
HIST 1308	Introduction to Middle Eastern History	3
HIST 1438	Introduction to Korean History	3
HIST 1518	Introduction to South Asian History to 1757	3
HIST 1528	Introduction to South Asian History since 1757	3
HIST 1618	Introduction to Chinese History to 1644	3
HIST 1628	Introduction to Chinese History since 1644	3
HIST 1708	Introduction to Japanese History	3
HIST 1818	Introduction to Jewish History: Bible to 1492 (Cross-listed with JSWT 1818)	3
HIST 1828	Introduction to Jewish History since 1492 (Cross-listed with JWST 1828)	3
HIST 2100	Revolution in History	3
HIST 2110	History of Early Modern Societies	3
HIST 2170	History of Christianity 1: To the Reformation	3
HIST 2220	History of War and Society	3
HIST 2629	China in World History	3
HIST 4190	French Connections: Contemporary France and America in Historical Context (Cross-listed with IAFS 3500)	3
IAFS 3650	History of Arab-Israeli Conflict (Cross listed with JWST 3650)	3
JWST 3100	Judaism (Cross-listed with RLST 3100)	3
RUSS 2211	Introduction to Russian Culture	3
RUSS 2221	Introduction to Modern Russian Culture	3
RUSS 2222	Sports and the Cold War	3
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century	3
RUSS 3601	Russian Culture Past and Present	3
RUSS 4301	American-Russian Cultural Relations	3
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present	3
SCAN 2202	The Vikings	3

5. US Historical Context (3 credits)

BAKR 1500	Colorado: History, Ecology, and Environment	3
CAMW 2001	The American West	3
ECON 4524	Economic History of the United States	3
ECON 4697	Industrial Organization and Regulation	3
EDUC 2125	History of American Public Education	3

ENGL 2115	American Frontiers	3
ETHN 2004	Themes in American Culture 1	3
ETHN 2013	Critical Issues in Native North America	3
ETHN 2014	Themes in American Culture 2	3
ETHN 2432	African American History (Cross-listed with HIST 2437)	3
ETHN 2536	Survey of Chicana/o History and Culture	3
ETHN 3015	Asian Pacific American Communities	3
ETHN 4504	Ethnic-American Autobiography	3
HIST 1015	American History to 1865	3
HIST 1025	American History since 1865	3
HIST 2015	Themes in Early American History	3
HIST 2126	Issues in Modern U.S. Politics and Foreign Relations	3
HIST 2166	The Vietnam Wars	3
HIST 2516	America Through Baseball	3
HUMN 2145	African America in the Arts	3
ITAL 4350	From Wops to Dons to Movers and Shakers: The Italian-American Experience	3
PSCI 3011	The American Presidency and the Executive Branch	3
PSCI 3054	American Political Thought	3
PSCI 3061	State Government and Politics	3
RUSS 4301	American-Russian Cultural Relations	3
SOCY 1021	United States Race and Ethnic Relations	3
WGST 2400/3016	Women of Color and Activism	3

6. Literature and Arts (3 credits)

ARTH 1300	History of World Art 1	3
ARTH 1400	History of World Art 2	3
ARTH 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World (Cross Listed with CLAS 1509)	4
ARTH 1709	Freshmen Seminar: Critical Introduction to Art History	3
ARTH 2409	Intro to Asian Art	3
CHIN 1051	Masterpieces of Chinese Literature in Translation	3
CHIN 2441	Film and the Dynamics of Chinese Culture	3
CLAS 1100	Greek Mythology	3
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece	3
CLAS 1115	Masterpieces of Greek Literature in Translation	3
CLAS 1120	Power and Passion in Ancient Rome	3
COMR 1800	Visual Literacy: Images and Ideologies	3
DNCE 1017	Dance in Popular Culture and Media	3
DNCE 1027	Dance in Cultural Perception and Expression	3
ENGL 1220	From Gothic to Horror	3
ENGL 1230	Environmental Literature	3
ENGL 1420	Poetry	3
ENGL 1500	Masterpieces of British Literature	3
ENGL 1600	Masterpieces of American Literature	3
FARR 2002	Literature of Lifewriting	3
FREN 1200	Medieval Epic Through Game of Thrones	3
FREN 1610	How to Be French, 1: The Ancien Regime	3

GEOG 1992	Human Geographies	3
GEOG 3402	Natural Hazards	3
GEOG 1962	Geographies of Global Change	3
GEOG 3662	Economic Geography	3

8. American Government (3 credits)

PSCI 1101	Introduction to American Politics	3
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9. Ethics (3 credits)

PHIL 1100	Ethics	3
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10. Public Speaking (3 credits)

COMM 1300	Public Speaking	3
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Leadership and Community Engagement - Bachelor of Arts (BA)

The Bachelor of Arts in Leadership and Community Engagement prepares ethical, skilled leaders committed to addressing complex public challenges in our nation and across the world. This major prepares you for careers in community or non-profit organizations, higher education, international development, urban planning, social work, government, and more. It is the only degree program of its kind in Colorado and part of a small number of emerging community engagement degrees nationwide.

This major requires students to get a dual degree, by completing a second degree in the College of Arts and Sciences with a major in either a Social Sciences or Arts and Humanities field. For Social Sciences, these options are: Anthropology, Political Science, Sociology, Ethnic Studies, Women and Gender Studies, and Geography. For Arts and Humanities, these options are: English, Jewish Studies, Philosophy, Spanish & Portuguese, Asian Studies. Through this program, you will develop a deep conceptual understanding of theories of leadership, public policy, and social change. Additionally, you'll use hands-on work in the community to create a capstone project that addresses a local leadership challenge. The coursework builds on the work of CU Engage: Center for Community-Based Learning and Research (<http://www.colorado.edu/cuengage>).

1. Second Major Requirements

This major requires students to get a dual degree by completing a second degree in the College of Arts and Sciences with a major in either a Social Sciences or Arts and Humanities field.

For Social Sciences, these options are:

- Anthropology (p. 144)
- Ethnic Studies (p. 291)
- Geography (p. 322)
- Political Science (p. 457)
- Sociology (p. 487)
- Women and Gender Studies (p. 534)

For Arts and Humanities, these options are:

- Asian Studies (p. 196)
- English (p. 272)
- Jewish Studies (p. 404)
- Philosophy (p. 438)

- Spanish & Portuguese (p. 496)

2. School of Education Requirements

EDUC 2020	Step 1: Inquiry Approaches to Teaching	1
EDUC 2050	Step into Humanities Teaching	1
EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies.)	3
Please note: Students will choose between INVS 2989 Dialogue Across Difference in spring of their first year or INVS 2919 Renewing Democracy in fall of their second year.		3
INVS 2919	Renewing Democracy in Communities and Schools	3
Or		
INVS 2989 Dialogue Across Difference		
LEAD 1000	Becoming a Leader	3
COMM 1300	Public Speaking (Meets Arts and Science Core requirement for Ideas & Values.)	3
PHIL 1100	Ethics (Meets Arts and Science Core requirement for Ideas & Values.)	3

Total Credit Hours 17

3. Leadership and Community Engagement Requirements

Theoretical Foundations (3 courses, 9 credits)

EDUC 2XXX: Theories of Social Change (new course to be developed)	3
INVS 3XXX: Multicultural Leadership: Theories, Principles and Practices (new course to be developed)	3
INVS 4402 Nonviolent Social Movements	3

Applied Research (3 courses, 9 credits)

SOCY 2061 Introduction to Social Statistics	3
EDUC 3XXX Qualitative Research Methods (new course to be developed)	3
EDUC 4XXX: Community-Based Research Methods (new course to be developed)	3

Learning in Community Settings (2 courses, 7 credits)

EDUC 4411 Educational Psychology for Elementary Schools	4
EDUC 4112 Educational Psychology and Adolescent Development	3

Community Leadership Practice (2 courses, 3 credits and 2 credits, respectively)

LEAD 4XXX and LEAD 4XXX: Leadership Capstone 1 & 2 (2-semester sequence, new courses to be developed)	5
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Requirements for dual degree, completion of Arts and Sciences Core (3 courses, 9 credits)

6 additional Natural Science credits beyond the 7 completed for the Liberal Arts Core. Within this 13 credits of Natural Science would need to be an approved two-course introductory sequence.

Choice of Upper-Division Literature and Arts course	3
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Total Credit Hours 39

4. Liberal Arts Core Requirements

- Quantitative Reasoning and Mathematical Skills (3-6 credit hours)
- Written Communication (6 credit hours: 3 credit hours are upper-division)

- Historical Context (3 credit hours)
- US Context (3 credit hours)
- Literature & Arts (6 credit hours: minimum 3 credit hours upper-division)
- Natural Sciences (7 credit hours)
- Contemporary Societies (3 credit hours)
- Ideals and Values (3 credit hours)
- Human Diversity (3 credit hours)

Quantitative Reasoning and Mathematical Skills (3-5 credit Hours)

Choose from the courses listed below:

ECEN 1500	Sustainable Energy
ECON 1078	Mathematical Tools for Economists 1
ECON 1088	Mathematical Tools for Economists 2
MATH 1011	College Algebra
MATH 1012	Quantitative Reasoning and Mathematical Skills
MATH 1071	Finite Mathematics for Social Science and Business
MATH 1081	Calculus for Social Science and Business
MATH 1110	Mathematics for Elementary Educators 1
MATH 1130	Mathematics from the Visual Arts
MATH 1150	Precalculus Mathematics
MATH 1310	Calculus, Systems, and Modeling
MATH 2380	Mathematics for the Environment
PHYS 1010	Physics of Everyday Life 1
PHYS 1020	Physics of Everyday Life 2
PSCI 2075	Quantitative Research Methods
PSCI 3105	Designing Social Inquiry: An Introduction to Analyzing Political Phenomena

Any 3 credit hour courses of mathematics courses numbered MATH 1300 and above or applied mathematics courses numbered APPM 1350 and above

Written Communication (6 credit hours: 3 credit hours are upper-division)

Choose from the courses listed below:

Written Communication (6) (3 credit upper-division)

Lower-Division Courses

ARSC 1080	College Writing and Research
ARSC 1150	Writing in Arts and Sciences
CLAS 1020	Argument from Evidence: Critical Writing about the Ancient World
EBIO 1940	College Writing for Science Students
ENGL 1001	Freshman Writing Seminar
ENVS 1150	First-Year Writing in Energy, Environment and Sustainability
IPHY 1950	Introduction to Scientific Writing in Integrative Physiology
PHIL 1500	Reading, Writing and Reasoning
WRTG 1100	Extended First-Year Writing and Rhetoric
WRTG 1150	First-Year Writing and Rhetoric
WRTG 1250	Advanced First-Year Writing and Rhetoric

Upper Division Courses

ARSC 3100	Multicultural Perspective and Academic Discourse
CHIN/JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization
EBIO 3940	Written Communication in the Sciences
ENVS 3020	Advanced Writing in Environmental Studies
GEOL 3090	Developing Scientific Writing Skills
HIST 3020	Historical Thinking & Writing
HONR 3220	Advanced Honors Writing Workshop
ITAL 3025	Advanced Composition 2: Introduction to Literary Writing
IPHY 3700	Scientific Writing in Integrative Physiology
PHIL 3480	Critical Thinking/Writing in Philosophy
PHYS 3050	Writing in Physics: Problem-Solving and Rhetoric
RLST 3020	Advanced Writing in Religious Studies
SOCY 4010	Sociology Capstone Course: Professional Writing
SPAN 3010	Advanced Rhetoric and Composition
WGST 3800	Advanced Writing in Feminist Studies
WRTG 3007	Writing in the Visual Arts
WRTG 3020	Topics in Writing
WRTG 3030	Writing on Science and Society
WRTG 3035	Technical Communication and Design
WRTG 3040	Writing on Business and Society

Historical Context (3 credit hours)

Choose from the courses listed below:

Historical Context

ANTH 1180	Maritime People: Fishers and Seafarers
ANTH 1190	Origins of Ancient Civilizations
ANTH 2200	The Archaeology of Human History
ANTH/CLAS 3009	Modern Issues, Ancient Times
ARAB 3230	Islamic Culture and the Iberian Peninsula
ARTH/CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
CEES/HIST 1626	Introduction to Central and East European History since 1770
ARTH/CLAS 3019	Pompeii and the Cities of Vesuvius
CLAS 1030/PHIL 1010	Introduction to Western Philosophy: Ancient
CLAS/HIST 1051	The World of the Ancient Greeks
CLAS/HIST 1061	The Rise and Fall of Ancient Rome
CLAS 1140	Bread and Circuses: Society and Culture in the Roman World
ECON 4514	Economic History of Europe
ENGL 3164	History and Literature of Georgian Britain
ENGL 4113	History and Culture of Medieval England
GRMN 2301	Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600

HIST 1018	Introduction to Early Latin American History to 1810
HIST 1012	Empire, Revolution and Global War: European History Since 1600
HIST 1028	Introduction to Modern Latin American History since 1800
HIST 1113	Introduction to British History to 1660
HIST 1123	Introduction to British History Since 1660
HIST 1218	Introduction to Sub-Saharan African History to 1800
HIST 1228	Introduction to Sub-Saharan African History Since 1800
HIST 1308	Introduction to Middle Eastern History
HIST 1438	Introduction to Korean History
HIST 1518	Introduction to South Asian History to 1757
HIST 1528	Introduction to South Asian History since 1757
HIST 1618	Introduction to Chinese History to 1644
HIST 1628	Introduction to Chinese History since 1644
HIST 1708	Introduction to Japanese History
HIST/JWST 1818	Introduction to Jewish History: Bible to 1492
HIST/JWST 1828	Introduction to Jewish History since 1492
HIST 2100	Revolution in History
HIST 2110	History of Early Modern Societies
HIST 2170	History of Christianity 1: To the Reformation
HIST 2220	History of War and Society
HIST 2629	China in World History
HIST 4190/ IAFS 3500	French Connections: Contemporary France and America in Historical Context
HONR 2251	Introduction to the Bible
IAFS/JWST 3650	History of Arab-Israeli Conflict
JWST/RLST 3100	Judaism
LIBB 1700	The History of Communication from Caves to Cyberspace
PHIL 1020	Introduction to Western Philosophy: Modern
PHIL 3000	History of Ancient Philosophy
PHIL 3010	History of Modern Philosophy
PHIL 3410	History of Science: Ancients to Newton
PHIL 3430	History of Science: Newton to Einstein
RLST 3000	Christian Traditions
RUSS 2211	Introduction to Russian Culture
RUSS 2221	Introduction to Modern Russian Culture
RUSS 2222	Sports and the Cold War
RUSS 2471	Women in Russian Culture: From Folklore to the Nineteenth Century
RUSS 3601	Russian Culture Past and Present
RUSS 4301	American-Russian Cultural Relations
RUSS 4481	Rogues to Revolutionaries: Russian Rebels, Past and Present
SCAN 2202	The Vikings

US Context (3 credit hours)

Choose from the courses listed below:

ANTH 3170	America: An Anthropological Perspective
ARTH 3509	American Art
BAKR 1500	Colorado: History, Ecology, and Environment
CAMW 2001	The American West
ECON 4524	Economic History of the United States
ECON 4697	Industrial Organization and Regulation
EDUC 2125	History of American Public Education
ENGL 2115	American Frontiers
ETHN 2004	Themes in American Culture 1
ETHN 2013	Critical Issues in Native North America
ETHN 2014	Themes in American Culture 2
ETHN 2432	African American History
ETHN 2536	Survey of Chicana/o History and Culture
ETHN 3015	Asian Pacific American Communities
ETHN 4504	Ethnic-American Autobiography
HIST 1015	American History to 1865
HIST 1025	American History since 1865
HIST 2015	Themes in Early American History
HIST 2126	Issues in Modern U.S. Politics and Foreign Relations
HIST 2166	The Vietnam Wars
HIST 2516	America Through Baseball
HUMN 2145	African America in the Arts
INVS 1523	Civic Engagement: Democracy as a Tool for Social Change
ITAL 4350	From Wops to Dons to Movers and Shakers: The Italian-American Experience
LIBB 2800	Horror Films and American Culture
LING 1000	Language in U.S. Society
MUEL 2752	Music in American Culture
PHIL 1200	Contemporary Social Problems
PHIL 2220	Philosophy and Law
PSCI 1101	Introduction to American Politics
PSCI 3011	The American Presidency and the Executive Branch
PSCI 3021	U.S. Campaigns and Elections
PSCI 3054	American Political Thought
PSCI 3061	State Government and Politics
PSCI 3071	Urban Politics
PSCI 3163	American Foreign Policy
PSCI 3274	Capitalism and its Critics
RLST 2500	Religions in the United States
RLST 3050	Religion and Literature in America
RUSS 4301	American-Russian Cultural Relations
SOCY 1021	United States Race and Ethnic Relations
SOCY/WGST 3016	Marriage and the Family in U.S. Society
SOCY 3151	Self in Modern Society
WGST 2400	Women of Color and Activism

Literature & Arts (6 credit hours: minimum 3 credit hours upper-division)

Choose from the courses listed below:

Lower-Division Courses

ARTH 1300	History of World Art 1
ARTH 1400	History of World Art 2
ARTH/CLAS 1509	Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World
ARTH 1709	Freshmen Seminar: Critical Introduction to Art History
ARTH 2409	Intro to Asian Art
ARTH/CLAS 2039	Greek Art and Archaeology
ARTH/CLAS 2049	Introduction to Roman Art and Architecture
CHIN 1051	Masterpieces of Chinese Literature in Translation
CHIN 2441	Film and the Dynamics of Chinese Culture
CLAS 1100	Greek Mythology
CLAS 1110	Gods, Monsters and Mortals: Literature of Ancient Greece
CLAS 1115	Masterpieces of Greek Literature in Translation
CLAS 1120	Power and Passion in Ancient Rome
COMR 1800	Visual Literacy: Images and Ideologies
DNCE 1017	Dance in Popular Culture and Media
DNCE 1027	Dance in Cultural Perception and Expression
ENGL 1220	From Gothic to Horror
ENGL 1230	Environmental Literature
ENGL 1420	Poetry
ENGL 1500	Masterpieces of British Literature
ENGL 1600	Masterpieces of American Literature
FARR 2002	Literature of Lifewriting
FREN 1200	Medieval Epic Through Game of Thrones
FREN 1610	How to Be French, 1: The Ancien Regime
FREN 1620	How To Be French? 2: Modernity
FREN 1880	The Zombie in History and Popular Culture
FREN 1900	Modern Paris in Literature, Photographs, Paintings and Movies
GRMN 1602	Metropolis and Modernity
GRMN 2501	Miniatures of Modern Life: Introduction to Short Fiction
GRMN 2503	Fairy Tales of Germany
GRMN/HUMN 2601	Kafka and the Kafkaesque
JWST 2551	Modern Jewish Literature
HONR 2860	The Figure of Socrates
HUMN 1110	Introduction to Humanities: Literature 1
HUMN 1120	Introduction to Humanities: Literature 2
HUMN 1210	Introduction to Humanities: Art and Music 1
HUMN 1220	Introduction to Humanities: Art and Music 2
HUMN 2100	Arts, Culture and Media
ITAL 1600	Strategies of Fear: Introduction to Italian Fantastic Literature
JPNS 1051	Masterpieces of Japanese Literature in Translation

MUEL 1832	Appreciation of Music
MUEL 2852	Music of the Rock Era
MUEL 2862	American Film Musical
RUSS 2231	Fairy Tales of Russia
RUSS 2241	The Vampire in Literature and the Visual Arts
RUSS 2251	Knights and Amazons: Superheroes in Russian Epics and Film
RUSS 2261	The Russian Short Story
SCAN 1202	Tolkien's Nordic Sources and the Lord of the Rings
SPAN 1000	Cultural Difference through Hispanic Literature
THTR 1009	Theatre and Society
THTR 1011	Global Theatre 1: Live Performance to Shakespeare
WGST 2200	Women, Literature, and the Arts

Upper-Division Courses

ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit
ARTH 4329	Modern Art 1
CHIN/HUMN 3341	Literature and Popular Culture in Modern China
CHIN 3351	Reality and Dream in Traditional Chinese Literature
CLAS/HUMN 4110	Greek and Roman Epic
CLAS/HUMN 4120	Greek and Roman Tragedy
CLAS/HUMN 4130	Greek and Roman Comedy
DNCE 4017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance
DNCE 4037	Contemporary Concert Dance: Shifting Perspectives in Performance
ENGL 3000	Shakespeare for Nonmajors
ENGL 3060	Modern and Contemporary Literature for Nonmajors
ENGL 3300	Literary London
FILM/RUSS 3211	History of Russian Cinema
FILM 3402	European Film and Culture
FILM/HUMN 3660	The Postmodern
FILM/HUMN 4135	Art and Psychoanalysis
FREN 3200	Introduction to Literary Theory and Advanced Critical Analysis
FREN 4300	Theatre and Modernity in 17th Century France
GRMN 3502	Literature in the Age of Goethe
GRMN/HUMN 3702	Dada and Surrealist Literature
GRMN/HUMN 3802	Politics and Culture in Berlin 1900-1933
GRMN/HUMN 4504	Goethe's Faust
HEBR/JWST 4203	Israeli Literature: Exile, Nation, Home

HEBR/JWST 4301	Venice: The Cradle of European Jewish Culture
HIND 3851	Devotional Literature in South Asia
HUMN 4170	Fiction and Reality: Literature, Science, and Culture
HUMN/ITAL 4140	The Age of Dante: Readings from The Divine Comedy
HUMN/ITAL 4150	Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages
HUMN/RUSS 4811	19th Century Russian Literature
HUMN/RUSS 4821	20th Century Russian Literature and Art
ITAL 4145	The Age of Dante in Italian
ITAL 4600	Once Upon a Time in Italy
JWST/RUSS 4401	The Russian Jewish Experience
MUEL 3822	Words and Music
MUEL 3832	Music in Literature
RUSS 3241	Red Star Trek: Russian Science Fiction Between Utopia and Dystopia
RUSS 4831	Contemporary Russian Literature
SCAN 3202	Old Norse Mythology
SCAN 3203	19th & 20th Century Nordic Literature
SCAN 3204	Medieval Icelandic Sagas
SCAN 3205	Scandinavian Folk Narrative
SCAN 3506	Scandinavian Drama
SPAN 3260	Late 19th and 20th Century Argentine Narrative
SPAN 3700	Selected Readings: Spanish Literature in Translation
SPAN 3800	Selected Readings: Latin American Literature in Translation
THTR 3011	American Musical Theatre History

Natural Sciences (13 credit hours: 7 credit hours in two-semester sequence with lab and 6 credits non-sequence)

Two-Semester Sequences (Note: Although not recommended, the first semester of a sequence may be taken as a single course. Also, some sequences have included, corequisite, or optional laboratories.)

ANTH 2010 & ANTH 2020	Introduction to Biological Anthropology 1 and Introduction to Biological Anthropology 2 (Optional labs ANTH 2030, ANTH 2040)
ASTR 1000 & ASTR 1020	The Solar System and Introductory Astronomy 2 (Sequence does not include a lab.)
ASTR 1010 & ASTR 1020	Introductory Astronomy 1 and Introductory Astronomy 2 (Lab included in ASTR 1010)
ASTR 1030 & ASTR 1040	Accelerated Introductory Astronomy 1 and Accelerated Introductory Astronomy 2 (Lab included in ASTR 1030)
ATOC 1050 & ATOC 1060	Weather and the Atmosphere and Our Changing Environment: El Nino, Ozone, and Climate (Optional lab ATOC 1070)

CHEM 1011 & CHEM 1031	Environmental Chemistry 1 and Environmental Chemistry 2 (Lab included in CHEM 1031)
CHEM 1113 & CHEM 1133	General Chemistry 1 and General Chemistry 2 (Corequisite labs CHEM 1114 and CHEM 1134)
EBIO 1030 & EBIO 1040	Biology: A Human Approach 1 and Biology: A Human Approach 2
EBIO 1210 & EBIO 1220	General Biology 1 and General Biology 2
GEOG 1001 & GEOG 1011	Environmental Systems: Climate and Vegetation and Environmental Systems: Landscapes and Water
GEOL 1010 & GEOL 1020	Introduction to Geology and Introduction to Earth History (Optional lab GEOL 1030)
GEOL 1010 & GEOL 1040	Introduction to Geology and Geology of Colorado (Optional lab GEOL 1030)
GEOL 1010 & GEOL 1060	Introduction to Geology and Global Change: An Earth Science Perspective (Optional lab GEOL 1030)
MCDB 1030 & MCDB 1041	Introduction to Molecular Biology and Fundamentals of Human Genetics (Lab MCDB 1043)
MCDB 1150 & MCDB 2150	Introduction to Cellular and Molecular Biology and Principles of Genetics (Optional labs MCDB 1151, MCDB 2151)
PHYS 1010 & PHYS 1020	Physics of Everyday Life 1 and Physics of Everyday Life 2 (Lab included in PHYS 1020)
PHYS 1110 & PHYS 1120	General Physics 1 and General Physics 2 (Optional lab PHYS 1140)
PHYS 2010 & PHYS 2020	General Physics 1 and General Physics 2 (Lab included)

Non-Sequence Courses

ANTH 3000	Primate Behavior
ANTH 3010	The Human Animal
AREN 2110	Thermodynamics
ASTR 1200	Stars and Galaxies
ASTR 2000	Ancient Astronomies of the World
ASTR 2010	Modern Cosmology-Origin and Structure of the Universe
ASTR 2020	Space Astronomy and Exploration
ASTR 2030	Black Holes
ASTR/GEOL 2040	The Search for Life in the Universe
ATOC 3050	Principles of Weather
ATOC/GEOL 3070	Introduction to Oceanography
ATOC 3300/ GEOG 3301	Analysis of Climate and Weather Observations
ATOC 3500/ CHEM 3151	Air Chemistry and Pollution
ATOC 4550	Mountain Meteorology
ATOC 4770	Wind Energy Meteorology

ATOC/ ENVS 3600/ GEOG 3601	Principles of Climate	COMM 1210	Perspectives on Human Communication
ATOC 4700	Weather Analysis & Forecasting	ECON 2010	Principles of Microeconomics
ATOC 4750	Desert Meteorology and Climate	ECON 2020	Principles of Macroeconomics
CHEM 1021	Introductory Chemistry (Lab included)	ECON 3403	International Economics and Policy
CHEM 1400	Foundations of Chemistry	ECON 3535	Natural Resource Economics
EBIO 3180	Global Ecology	ECON 3545	Environmental Economics
EDUC 1580	Energy and Interactions	EDUC 3013	School and Society
ENVS 1000	Introduction to Environmental Studies	ETHN 1025	Introduction to Asian American Studies
ENVS/PHYS 3070	Energy and the Environment	ETHN 2232	Contemporary African American Social Movements
ENVS/GEOL 3520	Energy and Climate Change: An Interdisciplinary Approach	ETHN 2242	African American Social and Political Thought
GEOG 3511	Introduction to Hydrology	ETHN 3015	Asian Pacific American Communities
GEOG/GEOL 4241	Principles of Geomorphology	GEOG 3742	Place, Power, and Contemporary Culture
GEOL 2100	Environmental Geology	GRMN 1601	Germany Today
GEOL 3040	Global Change: The Recent Geological Record	HIST 2126	Issues in Modern U.S. Politics and Foreign Relations
GEOL 3720	Evolution of Life: The Geological Record	HIST 2166	The Vietnam Wars
GEOL 3950	Natural Catastrophes and Geologic Hazards	HUMN 4835	Literature and Social Violence
IPHY 2420	Nutrition for Health and Performance	IAFS 1000	Global Issues and International Affairs
IPHY 3660	Dynamics of Motor Learning	INVS 3000	Innovative Approaches to Contemporary Issues through Service Learning
MCDB 3150	Biology of the Cancer Cell	INVS 4302/ PSCI 4732	Critical Thinking in Development
MCDB 3330	Evolution and Creationism	ITAL 1500	That's Amore: Introduction to Italian Culture
PHIL 1400	Philosophy and the Sciences	ITAL 4290	Italian Culture Through Cinema
PHIL 3410	History of Science: Ancients to Newton	JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
PHIL 3430	History of Science: Newton to Einstein	LIBB 2100	Russian Revolutions: Social and Artistic
PHYS 1230	Light and Color for Nonscientists	LING 1000	Language in U.S. Society
PHYS 1240	Sound and Music	PORT 2800	Brazil: Past and Present
PSYC 2012	Biological Psychology	PRLC 1820	Community Issues in Leadership
SLHS 2010	Science of Human Communication	PSCI 1101	Introduction to American Politics
1 Credit Hour Laboratory/Field Courses			
Note: Each course below has a prerequisite or corequisite.			
ANTH 2030	Laboratory in Biological Anthropology 1	PSCI 2012	Introduction to Comparative Politics
ANTH 2040	Laboratory in Biological Anthropology 2	PSCI 2223	Introduction to International Relations
ATOC 1070	Weather and the Atmosphere Laboratory	PSCI 3022	Russian Politics
CHEM 1114	Laboratory in General Chemistry 1	PSCI 3022	Russian Politics
CHEM 1134	Laboratory in General Chemistry 2	PSCI 3032	Democracy, Inequality and Violence in Latin America
CHEM 1401	Foundations of Chemistry Lab	PSCI 3074	Democracy and Its Citizens in the US and EU
EBIO 1050	Biology: A Human Approach Laboratory	PSCI 3082	Political Systems of Sub-Saharan Africa
EBIO 1230	General Biology Laboratory 1	PSCI 3143	Current Affairs in International Relations
EBIO 1240	General Biology Laboratory 2	PSCI 4002	Western European Politics
GEOL 1030	Introduction to Geology Laboratory 1	PSCI 4012	Global Development
MCDB 1043	Exploring Genetics Laboratory	PSCI 4062	East European Politics
MCDB 1151	Introduction to Cell and Molecular Biology Lab	PSYC 2606	Social Psychology
MCDB 2151	Principles of Genetics Laboratory	RLST 1850	Ritual and Media
PHYS 1140	Experimental Physics 1	RLST 2400	Religion and Contemporary Society
Contemporary Societies (3 credit hours)			
Choose from the courses listed below:			
ANTH 1200	Culture and Power	RUSS 2501	Russia Today
BAKR 1600	Creating a Sustainable Future	RUSS 4831	Contemporary Russian Literature
		SCAN 2201	Introduction to Modern Nordic Culture and Society
		SCAN 3201	Contemporary Nordic Society and Culture
		SLHS 1010	Disabilities in Contemporary American Society
		SOCY 1001	Introduction to Sociology

SOCY 4024	Juvenile Justice and Delinquency
WGST 2600	Gender, Race, and Class in a Global Context

***The Liberal Arts Core requires 40 total hours. Six (6) credits for the core are also part of the School of Education requirements:**

Ideas and Values (3 credit hours)

- PHIL 1100 Ethics

Human Diversity (3 credit hours)

- EDUC 3013 School and Society

Leadership and Community Engagement Sample Degree Plan

Course	Title	Credit Hours
Year One		
Fall Semester		
EDUC 2020	Step 1: Inquiry Approaches to Teaching	1
EDUC 3013	School and Society (meets Arts and Science Core Human Diversity requirement)	3
LEAD 1000	Becoming a Leader	3
Arts and Science Degree Major Course		3
Core (Natural Sciences Sequence)		4
		Credit Hours 14
Spring Semester		
EDUC 2050	Step into Humanities Teaching	1
COMM 1300	Public Speaking	3
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
Core (Natural Sciences Sequence)		3
Core		3
		Credit Hours 16
Year Two		
Fall Semester		
INVS 2919	Renewing Democracy in Communities and Schools	3
SOCY 2061	Introduction to Social Statistics	3
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3

Core	3
Credit Hours	15

Spring Semester

EDUC 2XXX Theories of Social Change	3
INVS 3XXX: Multicultural Leadership: Theories, Principles and Practices	3
Arts and Science Degree Major Course	3
Core	3
Core	3
Credit Hours	15

Year Three

Fall Semester

EDUC 3XXX Qualitative Research Methods	3	
INVS 4402	Nonviolent Social Movements	3
Arts and Science Degree Major Course	3	
Core	3	
Core	3	
Credit Hours	15	

Spring Semester

EDUC 4411	Educational Psychology for Elementary Schools	4
Arts and Science Degree Major Course		3
Arts and Science Degree Major Course		3
PHIL 1100	Ethics	3
Core		3
Credit Hours		16

Year Four

Fall Semester

LEAD 4XXX Leadership Capstone 1	3	
EDUC 4XXX Community-Based Research Methods	3	
Arts and Science Degree Major Course	3	
Core	3	
Core	3	
LEAD 4XXX Leadership Capstone 2	2	
EDUC 4112	Educational Psychology and Adolescent Development	3
Arts and Science Degree Major Course	3	
Arts and Science Degree Major Course	3	
Core	3	
Credit Hours	29	

Total Credit Hours 120

Education - Minor

The School of Education offers a 19-credit-hour Education Minor open to all undergraduates. The minor comprises 7 credit hours of core courses in education and 12 credit hours of elective courses. Courses are taught by faculty known for their teaching excellence. Courses and field experiences in the Education Minor introduce undergraduates to the complex interactions among the various political, cultural, social and historical dynamics that shape educational policy and practice. Through

the Education Minor students develop an understanding of learning and instructional practice in both formal and informal settings.

The Education Minor is designed to serve students with a passion for social justice who are interested in serving in the Peace Corps, leading after-school or community-based youth programs or working in education and youth policy. Individuals who plan to teach in a K–12 school setting should explore Teacher Licensure Programs.

Students in the Education Minor may also be affiliated with programs offered through CU Engage (p. 574).

Application Process and Minor Requirements

After completing one core Education Minor course, students need to contact the School of Education, Office of Student Services (303-492-6555/Room 151) and submit a completed application form.

A “B” average must be maintained in the Education Minor coursework (with C- as lowest acceptable course grade) in order to fulfill the requirements.

Core Courses (7 credit hours)

If a student decides to pursue licensure, these core courses can be transferred to an appropriate licensure program.

EDUC 3013	School and Society	3
Choose one of the following courses:		3
EDUC 4411	Educational Psychology for Elementary Schools	
EDUC 4112	Educational Psychology and Adolescent Development	
EDUC 4050	Knowing and Learning in Mathematics and Science	
Choose one of the following courses:		1
EDUC 2020	Step 1: Inquiry Approaches to Teaching	
EDUC 2050	Step into Humanities Teaching	
Total Credit Hours		7

Elective Options (12 credit hours)

Choose 4 courses from the options below:		12
EDUC 1580	Energy and Interactions	
EDUC 2125	History of American Public Education	
EDUC 2150	Education in Film	
EDUC 2625	Teaching English as a Second Language	
EDUC 3570	Learning With Technology In and Out of School	
INVS 2919	Renewing Democracy in Communities and Schools	
EDUC 4015	International / Comparative Education	
EDUC 4135	Story and Memoir	
EDUC 4222	Language Study for Educators	
EDUC 4311	Children’s Literature and Literacy Engagement in Elementary Schools	
EDUC 4425	Introduction to Bilingual/Multicultural Education	
Total Credit Hours		12

Please note: Students may also work with an advisor to identify additional EDUC courses to fulfill the minor elective requirements.

Leadership Studies - Minor

The Leadership Studies Minor is a valuable academic program available to all undergraduates regardless of major or college. The Leadership Studies Minor provides academically based leadership training that incorporates:

- Understanding the broad context of leadership theory
- Gaining a historical context of leadership
- Developing core leadership competencies
- Practicing and observing leadership experiences

By including the Leadership Studies Minor with a chosen field of study, undergraduates will develop essential skills that prepare them for future work in fields such as community organizing, business, city government, and social services. The minor offers an important credential that distinguishes students in the job exploration process.

The minor involves 16 credit hours of coursework that include a foundations course, three electives and a capstone course.

Additionally, the ePortfolio is a requirement for completion of the Leadership Studies Minor. The purpose of the ePortfolio is to exhibit, blend and demonstrate goals, accomplishments, and leadership experiences. Students are expected to fulfill this requirement by setting up a Google site using the ePortfolio template, and submitting academic and co-curricular reflection essays for each course taken towards the minor.

Students enrolled in the Presidents Leadership Class (PLC), INVST Community Studies, and all ROTC units should talk to their respective programs about how these programs can become integrated as pathways to the Leadership Studies Minor.

The possible pathways to the Leadership Studies Minor are explained in further detail below.

Leadership Minor: General Pathway Electives

Completion of the Leadership Studies Minor requires students to take 9 credits of elective coursework across three categories:

1. Leadership Foundations

Courses focus on:

- Moral and ethical reasoning
- Ability to critically evaluate behavior
- Improved decision-making of life choices

2. Leadership Application

Courses focus on:

- Enhanced ability to function in a team
- Building a team with diverse perspective
- Leading a team effectively to accomplish a shared goal

3. Leadership in Context

Courses focus on:

- Historical and situational analysis
- Critical evaluation of historical and contemporary leaders
- Ability to connect leadership behaviors to organizational outcomes

One elective from each category is required and of the three electives at least one course must be outside of a student's major. Students are responsible for understanding any pre-requisites or conditions for chosen electives. Ideally electives are taken sophomore through junior years and completed before entering the Capstone course.

Approved Electives by Category

1. Leadership Foundations

AIRR 3010	Air Force Leadership Studies I
COMM 2400	Discourse, Culture and Identities
COMM 2600	Organizational Communication
COMM 3410	Intercultural Communication
COMM 3420	Gender and Communication
COMM 3320	Persuasion in Society
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices
FNCE 2820	Introduction to Personal Financial Planning
HONR 1810	Honors Diversity Seminar
INVS 2919	Renewing Democracy in Communities and Schools
INVS 4402	Nonviolent Social Movements
MGMT 4040	Individual, Team, and Organizational Development
MILR 2031	Methods of Leadership and Management 1
NAVR 4020	Leadership and Ethics
PHIL 2140	Environmental Justice
PHIL 2270	Philosophy and Race
PHIL 2290	Philosophy and Women
PHIL 3140	Environmental Ethics
PHIL 3180	Critical Thinking: Contemporary Topics
PHIL 3200	Social and Political Philosophy
PHIL 3260	Philosophy and the International Order
PRLC 1820	Community Issues in Leadership
PSCI 2004	Survey of Western Political Thought
PSCI 3774	Free Speech and Dangerous Ideas
PSYC 2606	Social Psychology
PSYC 3456	Psychology of Personality
PSYC 3684	Developmental Psychology
SOCY 2011	Contemporary Social Issues and Human Values
SOCY 2021	Nonviolence and the Ethics of Social Action
SOCY 2031	Social Problems
SOCY 2077	Environment and Society

2. Leadership Application

AIRR 3020	Air Force Leadership Studies II
ANTH 2100	Introduction to Cultural Anthropology
ANTH 4180	Anthropological Perspectives: Contemporary Issues
CESR 4000	Leadership Challenges I: Exercises in Moral Courage
CESR 4005	Business Solutions for the Developing World: Learning through Service
CESR 4828	Experimental Seminar: Corporate Boards in Action
COMM 1300	Public Speaking
COMM 1600	Group Interaction
COMM 3320	Persuasion in Society
CVEN 5564	Water Profession: Leadership & Communication

CVEN 5834	Special Topics (Water Profession: Management and Utility Finance)
CVEN 5834	Special Topics (Managing Water Utilities: Current Issues & Future Challenges)
EMEN 4050	Leadership and Professional Skills
EMEN 4825	Entrepreneurial Business Plan Preparation
ESBM 3700	Entrepreneurial Environments
ETHN 2536	Survey of Chicana/o History and Culture
ETHN 3015	Asian Pacific American Communities
ETHN 3026	Women of Color: Chicanas in U.S. Society
ETHN 3201	Multicultural Leadership: Theories, Principles and Practices
GEOG 3682	Geography of International Development
GEOG 3742	Place, Power, and Contemporary Culture
INVS 3302	Facilitating Peaceful Community Change
INVS 3931	The Community Leadership Internship, Part 1
INVS 3932	Community Leadership Internship, Part 2
MGMT 4010	Redefining the Employee-Employer Relationship
MGMT 4030	Managing Employee Reward Systems
MILR 3052	Military Operations and Training 1
NAVR 2020	Seapower and Maritime Affairs
PRLC 2820	Multilevel Issues in Leadership
PSCI 2106	Introduction to Public Policy Analysis
PSCI 3031	Political Parties and Interest Groups
PSYC 4136	Judgment and Decision Making
PSYC 4553	Women's Mental Health: A Biopsychosocial Approach

3. Leadership in Context

AIRR 4010	National Security Affairs/Preparation for Active Duty
ETHN 2232	Contemporary African American Social Movements
ETHN 3403	Indigenous Rights and Red Power Movement
ETHN 3671	People of Color and Social Movements
ETHN 4672	Seminar on the Civil Rights and Black Power Movements
GEOG 1962	Geographies of Global Change
GEOG 4712	Political Geography
HIST 2100	Revolution in History
HIST 4021	Athens and Greek Democracy
HIST 4031	Alexander the Great and the Rise of Macedonia
HIST 4048	Latin American Revolutions
HIST 4083	Revolution and Nationalism in Modern Ireland
HIST 4116	History of U.S. Foreign Relations, 1865-1940
HIST 4126	History of U.S. Foreign Relations Since 1941
HIST 4146	U.S. Military History since 1898
HIST 4166	The Vietnam War in Politics and Culture
INVS 4931	Community Leadership in Action, Part 1
INVS 4932	Community Leadership in Action, Part 2
MILR 4072	Leadership 1: Adaptive Leadership
MILR 4082	Leadership 2: Leadership in a Complex World
NAVR 3101	Evolution of Warfare
NAVR 4010	Leadership and Management

PRLC 3800	Global Inquiry for 21st Century Leadership
PRLC 3810	Global Issues in Leadership
PSCI 2004	Survey of Western Political Thought
PSCI 2012	Introduction to Comparative Politics
PSCI 2106	Introduction to Public Policy Analysis
PSCI 2223	Introduction to International Relations
PSCI 3011	The American Presidency and the Executive Branch
PSCI 3031	Political Parties and Interest Groups
PSCI 3163	American Foreign Policy
PSCI 4012	Global Development
PSCI 4173	International Cooperation and Global Anarchy
PSCI 4183	International Law
PSYC 3511	History of Psychology

Leadership Minor: Presidents Leadership Class (PLC) Pathway

Students who are selected members of the Presidents Leadership Class can meet the requirements of the Minor in Leadership Studies as outlined below. Students should meet with the PLC professional staff for additional guidance.

Foundations Course

PRLC 1810	Ethical Leadership	3
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Electives

One elective required from each of the three categories below

1. Leadership Foundations (3 Credits required)

PRLC 1820	Community Issues in Leadership	3
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2. Leadership Application (3 credits required)

PRLC 2820	Multilevel Issues in Leadership	3
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3. Leadership in Context (3 credits required)

PRLC 3810	Global Issues in Leadership	3
or PRLC 3800	Global Inquiry for 21st Century Leadership	

Capstone

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
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Leadership Minor: Air Force ROTC Pathway

Students pursuing the Leadership Studies Minor through Air Force ROTC can meet the requirements for the Minor as outlined below.

Foundations Course

LEAD 1000	Becoming a Leader	3
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Electives

One elective required from each of the three categories below

1. Leadership Foundations (3 Credits required)

AIRR 3010	Air Force Leadership Studies I	3
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2. Leadership Application (3 credits required)

AIRR 3020	Air Force Leadership Studies II	3
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3. Leadership in Context (3 credits required)

AIRR 4010	National Security Affairs/Preparation for Active Duty	3
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Capstone

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
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Leadership Minor: Army ROTC Pathway

Students pursuing the Leadership Studies Minor through Army ROTC can meet the requirements for the Minor as outlined below.

Foundations Course

LEAD 1000	Becoming a Leader	3
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Another approved civilian equivalent

Electives

One elective required from each of the three categories below

1. Leadership Foundations (3 Credits required)

MILR 2031	Methods of Leadership and Management 1	3
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2. Leadership Application (3 credits required)

MILR 3052	Military Operations and Training 1	3
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3. Leadership in Context (3 credits required)

MILR 4072	Leadership 1: Adaptive Leadership	3
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Capstone

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
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Leadership Minor: Naval ROTC Pathway

Students pursuing the Leadership Studies Minor through Naval ROTC, including traditional Midshipmen programs, Seaman to Admiral (STA-21) and Marine Corps Enlisted Commissioning Educational Program (MECEP) can meet the requirements for the Minor as outlined below.

Foundations Course

LEAD 1000	Becoming a Leader	3
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Another approved civilian equivalent

Electives

One elective required from each of the three categories below

1. Leadership Foundations (3 Credits required)

NAVR 4020	Leadership and Ethics	3
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2. Leadership Application (3 credits required)

NAVR 2020	Seapower and Maritime Affairs	3
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3. Leadership in Context (3 credits required)

NAVR 4010	Leadership and Management	3
or NAVR 3101	Evolution of Warfare	

Capstone

LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone	4
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Teacher Licensure Program

The School of Education offers course work leading to initial Colorado licensure to undergraduate, postbaccalaureate and master's degree students. Colorado requires public school teachers to be licensed by its state department of education. Students who successfully complete all School of Education requirements will be recommended for a Colorado

provisional (initial) teaching license, the license issued to all new teachers in Colorado. Licensure requirements vary from state to state and from teaching area to area. Students who are interested in teaching in other states should familiarize themselves with the requirements of those states so they may plan an appropriate degree program.

Teacher education at the University of Colorado, while administered by the School of Education, is a university-wide function. Many academic departments provide course work that supports the teacher in training. Undergraduate students follow a prescribed set of Arts and Sciences core courses that meet state content preparation standards, complete a major and satisfy professional education requirements concurrently. The program involves a combination of courses at the university and K–12 school placements.

Undergraduate (p. 608) and Post-Baccalaureate (p. 600) (Non-master's Degree) Teacher Licensure Programs

- Elementary (grades K–6) Education
- Secondary Education (grades 7–12) fields:
 - English Language Arts
 - Mathematics
 - Science
 - Social studies
 - World language (French, German, Japanese, Latin, Russian or Spanish)
- Music Education (grades K–12)

Secondary Master's Degree Plus Teacher Licensure Program (p. 1177) (MA+)

- Secondary Education (grades 7–12) fields:
 - English Language Arts
 - Mathematics
 - Science
 - Social studies

Program Mission and Commitments

The School of Education prepares educators who are able to enact commitments to social justice and equitable access to deep content learning in school, family and community contexts.

The following principles guide our work in preparing the next generation of educators:

- Teachers must position students as sense-makers and knowledge-generators, who desire to invest and succeed in school. This involves noticing children/youth, building relationships with them, valuing their perspectives and attending to their thinking, curiosities and capabilities.
- Teaching is both intellectual work and a craft. Deep knowledge of content and pedagogy, creativity and passion fuel both learning and teaching.
- Teachers must design equitable learning environments in which all children are engaged in robust and consequential learning.
- Teacher's instruction and student learning is always conducted within the context of larger social systems, structures and hierarchies.
- What we do and say matters and must be analyzed. Our language and action constructs or constrains opportunities for children to build

meaningful, positive and sustained relationships to learning and one another.

Colorado Teacher Quality Standards

Teacher education candidates engage in a planned sequence of courses and accompanying clinical experiences in local community and school sites. Courses and assessments ensure candidates have demonstrated appropriate mastery of (1) content taught in the Colorado Academic Standards and (2) professional practices and dispositions associated with the Colorado Teacher Quality Standards listed below.

1. Teachers demonstrate mastery of and pedagogical expertise in the content they teach.
2. Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.
3. Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.
4. Teachers reflect on their practice.
5. Teachers demonstrate leadership.
6. Teachers take responsibility for student academic growth.

Admission Requirements

Students who already hold a bachelor's degree and wish to pursue licensure should apply directly to the School of Education. Students desiring institutional recommendation for licensure must complete at least 30 credit hours of work at the University of Colorado and also must fulfill the same content area requirements as undergraduate students. The actual number of required credit hours will depend on courses already completed.

Students may apply to one of the teacher education programs if the following requirements have been fulfilled:

1. **GPA:** Elementary and Secondary students must have and maintain a 2.75 (on a 4.00 scale) cumulative GPA, 2.75 at CU Boulder, 2.75 in their subject area (Secondary teacher fields) and 2.75 in education. Music K-12 Education students must have and maintain a 3.00 overall and in their subject area. Students applying to Master's Plus (MA+) programs must have and maintain a 3.00 cumulative GPA.
2. **Prior Degrees:** Students applying to Post-Baccalaureate and Master's Plus (MA+) programs must have a bachelor's degree from an accredited institution.
3. **Youth Experience:** Students must provide written verification of 25 clock hours of satisfactory experiences with elementary, middle/junior high or senior high school-aged youth (appropriate to the desired program) in the past five years. Forms for this purpose are available in the Office of Student Services, Education 151, or online at the School of Education (<http://www.colorado.edu/education/prospective-students>) website. Undergraduate students at CU Boulder meet this requirement through school experiences in EDUC 2020 Step 1: Inquiry Approaches to Teaching or EDUC 2050 Step into Humanities Teaching courses.
4. **Basic Skills:** All teacher education students must demonstrate basic skills competence in mathematics and literacy. This may be done through acceptable grades in appropriate college course work, or by acceptable standardized test scores. Contact the Office of Student Services in Education 151 for more information.
5. **Letters of Recommendation.** Contact the Office of Student Services in Education 151 for more information.

6. **Personal Statement.** Contact the Office of Student Services in Education 151 for more information.
7. **Background Check and Fee:** The School of Education and our partner districts require students working in schools to undergo background checks at least once per year. The costs and process for these background checks are changing due to new state requirements. Check with the Office of Student Services for the most updated information.
8. **Application Fee:** The appropriate application fee should be submitted with application materials. Fees vary by program.

Individuals interested in completing the teacher education program at the University of Colorado Boulder should request application materials from the Office of Student Services, Education 151 or online at the School of Education (<http://www.colorado.edu/education>) website. Students currently enrolled in a degree program at Boulder will need to complete an application.

Individuals who have completed a baccalaureate degree at an accredited institution and are not currently enrolled at the university must complete a program application, a university application and submit official transcripts from all previous colleges directly to the University's Office of Admissions (<http://www.colorado.edu/admissions>).

Advising

Students are responsible for obtaining and reading the undergraduate student handbook (<http://www.colorado.edu/education/current-students/forms-policies>). Off-campus students may obtain advising materials online (<http://www.colorado.edu/education/prospective-students>) or by calling 303-492-6555.

At CU Boulder, degree requirements vary among the schools and colleges. Students seeking a degree at the University of Colorado should consult, as soon as possible, with an advisor in the college or school from which they expect to graduate and with the School of Education advisor (edadvise@colorado.edu).

Students are encouraged to become familiar with the teacher education requirements by comparing their own transcripts to the published advising materials. Students can then talk with an advisor before applying to the program or they may wait until after their applications are processed. Students seeking teacher licensure in French, German, Japanese, Latin, Russian, Spanish or music should see the designated advisor for that content area in addition to the School of Education advisor.

Advising may also be obtained through email (edadvise@colorado.edu). When requesting email advising, please make questions as specific as possible.

Post-Baccalaureate

The School of Education offers course work leading to initial Colorado licensure to undergraduate, post-baccalaureate and master's degree students. Colorado requires public school teachers to be licensed by its state department of education. Students who successfully complete all School of Education requirements will be recommended for a Colorado provisional (initial) teaching license, the license issued to all new teachers in Colorado. Licensure requirements vary from state to state and from teaching area to area. Students who are interested in teaching in

other states should familiarize themselves with the requirements of those states so they may plan an appropriate degree program.

Teacher education at the University of Colorado, while administered by the School of Education, is a university-wide function. Many academic departments provide course work that supports the teacher in training. Undergraduate students follow a prescribed set of courses that meet state content preparation standards, complete a major and satisfy professional education requirements concurrently. The program involves a combination of courses at the university and K–12 school placements.

Post-Baccalaureate (Non-master's Degree) Teacher Licensure Programs

- Elementary Education (K–6) (p. 600)
- Music Education (grades K–12) (p. 601)
- Secondary English Language Arts (7#12) (p. 601)
- Secondary Math (7-12) (p. 602)
- Secondary Science (7-12) (p. 603)
- Secondary Social Studies (7#12) (p. 604)
- World Languages (p. 605) (French, German, Japanese, Latin, Russian or Spanish)

Elementary Education (K-6) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Written Communication: Three (3) credit hours in a college-level composition or writing course.	3
Literature	3
Mathematics: College-level mathematics	6
Social Studies: Complete two (2) of the following options: US History or Political Science, World History, Economics	6
Physical Science	3
Biological Science	3
Cultural/Human Geography	3

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4411	Educational Psychology for Elementary Schools (Includes up to two (2) hours per week of out-side service learning. May be taken at any time.)	4
EDUC 4311	Children's Literature and Literacy Engagement in Elementary Schools (May be taken at any time.)	3
EDUC 4320 & EDUC 4321	Reading Instruction for Elementary Schools and Writing Instruction for Elementary Schools (Three (3) credit hours each. Must be taken with EDUC 4321. Includes 4 hours per week of school based practicum.)	6

EDUC 5205 & EDUC 4351	Elementary Mathematics Theory and Methods and Differentiating Instruction in Diverse Elementary Classrooms (Three (3) credit hours each. Must be taken with EDUC 4351. EDUC 4320 & EDUC 4321 are prerequisites. Includes four (4) hours per week of school based practicum.)	6
EDUC 4331 & EDUC 4341 & EDUC 5215	Elementary Social Studies Methods and Elementary Reading Assessment and Instruction and Elementary Science Theory and Methods (Three (3) credit hours each. Must be taken with EDUC 4341 & 5215. EDUC 4351 & 5205 are prerequisites. Shares an all day, school based practicum.)	9
Total Credit Hours		31

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4691.
- EDUC 4691 Student Teaching: Elementary School 1 (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5001) or PLACE (test 01).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Music Education (K#12) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Written Communication: ENGL, ARSC, or WRTG from Arts and Sciences Core	3
Literature and the Arts: Choose from the Arts & Sciences Core area: Literature and the Arts (excluding music courses).	3
Math: Please see advisor for course options.	3
Social Science or Foreign Language (3rd semester or higher, excluding music courses).	3
Natural Sciences	3

Non-music Electives: Any courses offered at CU-Boulder outside of the College of Music, excluding any School of Education (EDUC) courses.

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
or EDUC 4411	Educational Psychology for Elementary Schools	
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum.)	3
Total Credit Hours		9

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for Student Teaching. No other courses may be taken during the Student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4732.
- EDUC 4732 Student Teaching K-12 (8 credits). Pass/fail only.
- MUSC 4193 Student Teaching Seminar (1 credit).
- MUSC 4133 Student Teaching Practicum (3 credits). Optional; check with the College of Music.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5113) or PLACE (test 29).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary English Language Arts (7# 12) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Mathematics: College-level mathematics.	3
Social Science	3
Natural Science	3

Advanced Writing: Critical or creative writing beyond the lower-division/introductory composition level.	3
History or Grammar of the English Language: Including or equivalent to EDUC 4222/EDUC 5222, CLAS 1010/LING 1010, LING 1500, or LING 2000.	3
Oral Communication: Includes speech, public speaking, or communication courses.	3
Visual Communication: Includes theatre, film, offerings from ATLAS, TAM or other digital media courses.	3
Literature: Must include a component of British literature as well as a multicultural/non-English literature.	9
Thirty (30) credit hours in English and English Language Arts related courses.	30
Acceptable coursework may be in Communication/Speech, Composition, Drama/Theatre, Humanities, Journalism, and/or Literature. (May include courses from the content requirements above.)	
Recent English coursework in the past five (5) years.	6

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 5325	Teaching Literature in Middle and Secondary Schools (May be taken at any time. Fall only.)	3
EDUC 4295	Reading and Literacy in the Secondary Classroom (Includes up to five (5) hours per week of school-based practicum. Must be taken concurrently with EDUC 4342. Available once you are admitted into the School of Education. Fall Only.)	4
EDUC 4342	Writing in Humanities Classrooms (Includes up to four (4) hours per week of school-based practicum. Must be taken concurrently with EDUC 4295. Available once you are admitted into the School of Education. Fall Only.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week in school-based practicum. EDUC 4295 and 4342 are prerequisites. Must be taken concurrently with EDUC 5365. Spring Only.)	3
EDUC 5365	Methods and Materials in Secondary English (Includes up to five (5) hours per week of school-based practicum. EDUC 4295 and 4342 are prerequisites. Must be taken concurrently with EDUC 4023. Spring Only.)	4
Total Credit Hours		23

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Math (7-12) Teacher Licensure Program for Post Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Writing: Three credit hours in writing or composition in English.	3
Humanities: Literature, Philosophy, Theater	3
Social Science	3
Natural Science	3
Calculus 1: Including or equivalent to APPM 1350, MATH 1300 or MATH 1310.	4
Calculus 2: Including or equivalent to APPM 1360 or MATH 2300.	4
Calculus 3: Including or equivalent to APPM 2350 or MATH 2400.	4
Linear Algebra: Including or equivalent to MATH 2135	3
Functions & Modeling/Analysis/Abstract Mathematics: One (1) course in functions and modeling, analysis, or topology.	3
Geometry: One course in modern geometry.	3
Probability & Statistics: One (1) course in probability theory and mathematical statistics.	3
Twenty-four (24) credit hours in Math or Applied Math coursework. Eighteen (18) of the required thirty hours above must be completed at the sophomore level or higher. (May include requirements above).	24
Recent Mathematics coursework in the past five (5) years. (May include requirements above and EDUC 5317)	6

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4050	Knowing and Learning in Mathematics and Science (Includes up to two (2) hours per week of school-based practicum.)	3

EDUC 5317	Perspectives on Mathematics (May be taken at any time. Fall only.)	3
EDUC 4060	Classroom Interactions (Includes up to five (5) hours per week of school-based practicum. This course is a prerequisite for EDUC 5375.)	3
EDUC 4232	Language and Literacy across the Curriculum (May be taken at any time. Spring only.)	3
EDUC 5375	Problem-Based Math Instruction (Includes up to six (6) hours per week of school-based practicum. Should be taken concurrently with EDUC 4023 Differentiating Instruction in Diverse Secondary Classrooms. EDUC 4060 is a prerequisite.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with EDUC 5375 Problem-Based Instruction. EDUC 4060 is a prerequisite.)	3
Total Credit Hours		22

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Science (7-12) Teacher Licensure Program for Post-Baccalaureate Studies

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Written Communication: Three credit hours in college-level composition or writing.	3
Humanities: Literature, Philosophy, Theater	3
Social Science	3
Calculus I: Including or equivalent to APPM 1350, MATH 1300, or MATH 1310.	4

Two (2) Biology courses.
Two (2) Chemistry courses.
Two (2) Earth/Space Science courses.
Two (2) Physics courses.
<i>Complete three (3) out of four (4) content area lab courses:</i>
Biology Lab
Earth/Space Science Lab
Chemistry Lab
Physics Lab

Content Tracks

Biology

Complete twenty four (24) credit hours in Biology (may include courses from biology area above). Coursework must include the study of: General Biology, Matter & Energy in Living Systems, Ecology, Evolution, Genetics, Molecular Biology, Human Anatomy, Environmental Biology, Biotechnology

Chemistry

Complete twenty four (24) credit hours in Chemistry (may include courses from biology area above). Coursework must include the study of: Analytical, Inorganic, Organic, Physical.

Earth/Space Science

Complete twenty four (24) credit hours in Earth/Space Science (may include courses from biology area above). Coursework must include the study of: Environmental Science, Astronomy, Historical & Physical Geology, Meteorology, Oceanography, Geomorphology & Earth Systems.

Environmental Science

Complete twenty four (24) credit hours in Environmental Science (may include courses from biology area above). Coursework must include the study of: Ecology, Astronomy, seventeen (17) credit hours in Biology.

Physics

Complete twenty four (24) credit hours in Physics (may include courses from biology area above). Coursework must include the study of: Mathematics through Differential Equations, Astronomy, Atomic & Nuclear, Classical Mechanics, Electricity & Magnetism, Heat & Thermodynamics, Optics & Sound, Quantum Mechanics, Radiation & Radioactivity, Relativity, Waves.

Recent Science coursework in the past five (5) years. Six (6) credit hours.

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4050	Knowing and Learning in Mathematics and Science (Includes up to two (2) hours per week of school-based practicum.)	3
EDUC 4060	Classroom Interactions (Includes up to five (5) hours per week of school-based practicum. This course is a prerequisite for EDUC 5385.)	3
EDUC 4232	Language and Literacy across the Curriculum (May be taken at any time. Spring only.)	3

EDUC 5385	Problem-Based Science Instruction (Includes up to six (6) hours per week of school-based practicum. Should be taken concurrently with EDUC 4023 Differentiating Instruction in Diverse Secondary Classrooms. EDUC 4060 is a prerequisite.)	3	Humanities: Literature, Philosophy, Theater	3
			Natural Science	3
			US History	6
			World History	6
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with EDUC 5385 Project-Based Instruction. EDUC 4060 is a prerequisite.)	3	Economics: Must be completed in an Economics department.	3
			Political Science: Must be completed in a Political Science department.	3
			Cultural/Human Geography: Must be completed in a Geography department. Physical Geography does NOT qualify.	3
<i>Complete two (2) of the following courses</i>		6	Sociology or Social/Cultural Anthropology: Must be completed in a Sociology or Anthropology department. Physical Anthropology does NOT qualify.	3
MCDB 4811	Teaching and Learning Biology		Thirty (30) credit hours of coursework in one (1) of the following disciplines: Anthropology, Economics, Ethnic Studies, Geography, History, International Affairs, or Political Science. A minimum of 12 credit hours must be upper division. (May include courses from the content requirements above.)	30
EDUC 4822	Teaching and Learning Chemistry (Spring only)		Recent Social Studies coursework in the past five (5) years. May be fulfilled by courses from requirements above.	6
EDUC/PHYS 4460	Teaching and Learning Physics (Fall only)			
EDUC/PHYS 1580	Energy and Interactions			
EDUC 4833	Teaching and Learning Earth Systems (Fall Only)			
GEEN 4400	Teaching Design			
Total Credit Hours		25		

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for Student Teaching. No other courses may be taken during the Student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Social Studies (7#12) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content, and education coursework. All grades must be a "C-" or better to satisfy a requirement.

A. Content Coursework Requirements

Complete all courses listed

Courses and Minimum Required Credit Hours

Mathematics	3
Writing: Three credit hours in writing or composition	3

B. Education Course Requirements

Complete all courses listed

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 5316	Nature of Social Studies and Social Studies Education (Includes school-based practicum. May be taken at any time. Fall only.)	3
EDUC 4295	Reading and Literacy in the Secondary Classroom (Includes up to five (5) hours per week of school-based practicum. Must be taken concurrently with EDUC 4342. Available once you are admitted into the School of Education. Fall only.)	4
EDUC 4342	Writing in Humanities Classrooms (Includes up to four (4) hours per week of schoolbased practicum. Must be taken concurrently with EDUC 4295. Available once you are admitted into the School of Education. Fall only.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week in school-based practicum. EDUC 4295 and 4342 are prerequisites. Must be taken concurrently with EDUC 5355. Spring only.)	3
EDUC 5355	Methods and Materials in Secondary Social Studies (Includes up to five (5) hours per week of school-based practicum. EDUC 4295 and 4342 are prerequisites. Must be taken concurrently with EDUC 4023. Spring only.)	4
Total Credit Hours		23

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for Student Teaching. No other courses may be taken during the Student teaching semester.

- EDUC 4513 Education and Practice : Two (2) credit hours. **Must be taken with EDUC 4712.**
- EDUC 4712 Student Teaching: Secondary School: Ten (10) credit hours. **Must be taken with EDUC 4513.**

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

World Languages

Secondary French (7#12) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Mathematics: College-level mathematics.	3
Social Science	3
Writing: Three credit hours in writing or composition in English.	3
French Phonetics and Pronunciation: Including and equivalent to FREN 3010	3
Advanced French Composition 1: Including and equivalent to FREN 3050	3
Advanced French Composition 2: Including and equivalent to FREN 3060	3
Critical reading and Writing in French literature: Including and equivalent to FREN 3100	3
French Literature Middle Ages to 1750: Including and equivalent to FREN 3110	3
French Literature 1750 Present Day: Including and equivalent to FREN 3120	3
Advanced Course on Francophone and or French Culture: Including and equivalent to FREN 3500	3
French literature or culture: Six (6) additional credit hours.	6
30 credit hours in French at the junior level or above. May include requirements from above.	30

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
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EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with FREN 4690)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3
FREN 5770	Methods of Teaching French as a Foreign Language (Fall only.)	2
FREN 4750	Methods of Teaching French and Professional Orientation (Fall only.)	3
Total Credit Hours		17

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and FREN 4960.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and FREN 4960.
- FREN 4960 High School French Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary German (7#12) Teacher Licensure Program for Post Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Mathematics: College-level mathematics.	3
Writing: Three (3) credit hours in writing or composition.	3
Social Science	3
Natural Science	3
Advanced German 1: Including or equivalent to GRMN 3010.	3
Advanced German 2: Including or equivalent to GRMN 3020.	3
Advanced Grammar, Stylistics, and Conversation: Including or equivalent to GRMN 4010.	3

GRMN 5020	Applied Linguistics and Foreign Language Teaching Methodology (or equivalent)	3
Electives:	Four (4) upper division or graduate courses in German, at least two (2) of which must be taught in German.	12
	Six (6) credit hours in a related field (e.g. Economics, History, Political Science, etc.).	6
	A total of thirty (30) hours in German and related fields.	30

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with GRMN 4660.)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall Only.)	3
GRMN 4450	Methods of Teaching German	3
	or GRMN 5020 Applied Linguistics and Foreign Language Teaching Methodology	

Note: May not count GRMN 5020 for academic preparation in German (section C, item 6) and for methods.

Total Credit Hours	15
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Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and GRMN 4460.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and GRMN 4460.
- GRMN 4460 High School German Teaching (6 credits). Must be taken concurrently EDUC 4513 & EDUC 4722. Pass/fail only.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Japanese (7#12) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Mathematics: College-level mathematics.	3
Social Science	3
Natural Science	3
Writing: Three (3) credit hours in writing or composition in English.	3
Advanced Japanese 1: Including or equivalent to JPNS 3110	5
Advanced Japanese 2: Including or equivalent to JPNS 3120	5
Japanese Literature	6
Japanese Culture	6
Recent Japanese coursework in the past five (5) years.	6
Thirty (30) credit hours of Japanese coursework. May include courses from above.	30

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum.)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3

Total Credit Hours	12
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Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Latin (7#12) Teacher Licensure Program for Post-Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements**Courses and Minimum Required Credit Hours**

Mathematics: College-level mathematics.	3
Writing: Three (3) credit hours in writing or composition in English.	3
Social Science	3
Natural Science	3
Beginning Latin 1: Including or equivalent to LATN 1014.	4
Beginning Latin 2: Including or equivalent to LATN 1024.	4
Intermediate Latin 1: Including or equivalent to LATN 2114.	4
Intermediate Latin 2: Including or equivalent to LATN 2124.	3
Two additional Latin reading courses above the sophomore level. Three (3) credit hours each.	6
Latin Prose Composition: Including or equivalent to CLAS 4024 or CLAS 5024.	3
General Classics: Classical literature, culture and thought, ancient history, or classical art and archaeology.	6
Latin electives to make thirty (30) hours in CLAS courses beyond introductory language courses. 18 hours must be upper-division.	30

Education Course Requirements**Courses and Minimum Required Credit Hours**

EDUC 5005	Advanced Social Foundations of Education (May be taken at any time. Fall only.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
or EDUC 6368	Adolescent Psychology and Development for Teachers	
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum.)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall Only.)	3
LATN 4824	Latin Teaching Methods: Open Topics	3
or LATN 5824	Latin Teaching Methods: Open Topics	
Total Credit Hours		15

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments**Licensure Exam: Prior to Student Teaching**

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Spanish (7#12) Teacher Licensure Program for Post Baccalaureate Students

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements**Courses and Minimum Required Credit Hours**

Mathematics: College-level mathematics.	3
Social Science	3
Natural Science	3
Writing: Three (3) credit hours in writing or composition in English.	3
Advanced Spanish Grammar	3
Advanced Spanish Composition/Hispanic Linguistics	3
Advanced Spanish Conversation	3
Culture & Civilization: Peninsular or Spanish-American. More courses may be available. Please contact an education advisor at 303-492-6555	3
Literary Analysis in Spanish	3
Six credit hours in a related field: Portuguese, Chicano Studies, Linguistics, another language (must be upper division), Comparative Literature, Political Science, or History.	6
Upper Division Spanish Literature	3
Recent Spanish coursework in the past five (5) years.	6
Thirty (30) credit hours of upper-division Spanish coursework. May include courses from above.	30

Education Course Requirements**Courses and Minimum Required Credit Hours**

EDUC 3013	School and Society (Meets Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum. Should be taken concurrently with SPAN 4650.)	3
SPAN 4650	Methods of Teaching Spanish (Spring only.)	3

Total Credit Hours

12

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4722 Student Teaching: Secondary School 2 (2 credits). Must be taken with EDUC 4722 and SPAN 4660.
- EDUC 4712 Student Teaching: Secondary School (5 credits). Must be taken with EDUC 4513 and SPAN 4660.
- SPAN 4660 High School Spanish Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Undergraduate Nondegree

The School of Education offers course work leading to initial Colorado licensure to undergraduate, post-baccalaureate and master's degree students. Colorado requires public school teachers to be licensed by its state department of education. Students who successfully complete all School of Education requirements will be recommended for a Colorado provisional (initial) teaching license, the license issued to all new teachers in Colorado. Licensure requirements vary from state to state and from teaching area to area. Students who are interested in teaching in other states should familiarize themselves with the requirements of those states so they may plan an appropriate degree program.

Teacher education at the University of Colorado, while administered by the School of Education, is a university-wide function. Many academic departments provide course work that supports the teacher in training. Undergraduate students follow a prescribed set of courses that meet state content preparation standards, complete a major and satisfy professional education requirements concurrently. The program involves a combination of courses at the university and K-12 school placements.

Undergraduate Nondegree Teacher Licensure Programs

- Elementary Education (K-6) (p. 608) (catalog.colorado.edu/undergraduate/colleges-schools/education/programs-study/teacher-licensure-program/undergraduate-nondegree/undergraduate/colleges-schools/education/programs-study/teacher-licensure-program/undergraduate-nondegree/#elementaryk6text)
- Music Education (K-12) (p. 609)
- Secondary English Language Arts (7#12) (p. 610)
- Secondary Math (7-12) (p. 611)
- Secondary Science (7-12) (p. 611)
- Secondary Social Studies (7#12) (p. 612)

- World Languages (p. 613) (French, German, Japanese, Latin, Russian or Spanish)

Elementary Education (K-6) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Foreign Language Requirement

All students are required to demonstrate third-level (intermediate) proficiency in a single foreign language. If not completed in high school, the student must pass an appropriate third-semester college course or an approved proficiency examination. Documentation is required.

Content Course Work Requirements

Written Communication	0
Choose a 3-credit college-level composition or writing course.	3
Mathematics	
Choose one of the following: ^{1,2}	5-6
MATH 1110 Mathematics for Elementary Educators 1 & MATH 1120 and Mathematics for Elementary Educators 2	
MATH 1300 Calculus 1	
World History	
Choose a 3-credit college-level course.	3
United States Context	3
Choose one course from the following:	3
CAMW 2001 The American West	
ECON 4524 Economic History of the United States	
EDUC 2125 History of American Public Education	
ETHN 2004 Themes in American Culture 1	
ETHN 2013 Critical Issues in Native North America	
ETHN 2014 Themes in American Culture 2	
ETHN 2432/ HIST 2437 African American History	
ETHN 2536 Survey of Chicana/o History and Culture	
ETHN 3015 Asian Pacific American Communities	
ETHN 3905/ WGST 3900	
HIST 1015 American History to 1865	
HIST 1025 American History since 1865	
HIST 2015 Themes in Early American History	
HIST 2126 Issues in Modern U.S. Politics and Foreign Relations	
HIST 2166 The Vietnam Wars	
HIST 2316	
HIST 2326 Issues in the History of U.S. Society and Culture	
HIST 2516 America Through Baseball	
HIST 2636/ WGST 2400	
PSCI 1101 Introduction to American Politics	
Physical Science	

Choose a 3-credit college-level course in astronomy, atmospheric and oceanic sciences, chemistry, geology, physics or physical geography. 3

Biological Science

Choose a 3-credit college-level course in the EBIO and MCDB departments. IPHY 2420 also satisfies this requirement. Physical anthropology will NOT be accepted. 3

Cultural/Human Geography

Choose a 3-credit college-level course in a geography department. Physical geography does NOT qualify. 3

Human Diversity

EDUC 3013 School and Society 3

Total Credit Hours 29-30

- ¹ CMCI communication majors may complete MATH 1011, MATH 1012, MATH 1021, MATH 1071, MATH 1081, or MATH 1150 and INFO 1201.
- ² Psychology majors may complete MATH 1011, MATH 1071, MATH 1081, or MATH 1150 and PSYC 2111.

Education Course Requirements

Take Any Time

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4411	Educational Psychology for Elementary Schools (includes up to 2 hours per week of outside service learning)	4
EDUC 4311	Children’s Literature and Literacy Engagement in Elementary Schools	3

Semester One

Each course includes 4 hours per week of school-based practicum.

EDUC 4320	Reading Instruction for Elementary Schools	3
EDUC 4321	Writing Instruction for Elementary Schools	3

Semester Two

Each course includes 4 hours per week of school-based practicum.

EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 4351	Differentiating Instruction in Diverse Elementary Classrooms	3

Semester Three

These courses share an all-day, school-based practicum.

EDUC 4331	Elementary Social Studies Methods	3
EDUC 4341	Elementary Reading Assessment and Instruction	3
EDUC 5215	Elementary Science Theory and Methods	3

Total Credit Hours 31

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4691.
- EDUC 4691 Student Teaching: Elementary School 1 (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5001) or PLACE (test 01).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

Music Education (K#12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Written Communication

Choose a 3-credit ENGL, ARSC or WRTG course from the Arts and Sciences Core Requirements list. 3

Literature and the Arts

Choose a 3-credit course from the Literature and the Arts area (excluding music courses) of the Arts & Sciences Core Requirements list. 3

Mathematics

Choose one course from the following: 3

MATH 1011	College Algebra	
MATH 1012	Quantitative Reasoning and Mathematical Skills	
MATH 1071	Finite Mathematics for Social Science and Business	
MATH 1081	Calculus for Social Science and Business	
MATH 1120	Mathematics for Elementary Educators 2	
MATH 1150	Precalculus Mathematics	
MATH 1300	Calculus 1	
MATH 1310	Calculus, Systems, and Modeling	
APPM 1350	Calculus 1 for Engineers	

Contemporary Societies, Human Diversity, US Context, Historical Context Ideals & Values, or Foreign Language (3rd sem. or higher) 3

Choose from the Arts & Sciences Core Requirements list (excluding music courses). 3

Natural Sciences

Choose a 3-credit college-level course. 3

Non-Music Electives

Choose 9 credits of courses offered at CU Boulder outside of the College of Music, excluding any School of Education (EDUC) courses. 9

Total Credit Hours 27

Education Course Requirements

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirements for Human Diversity or Contemporary Societies; may be taken at any time)	3
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EDUC 4112	Educational Psychology and Adolescent Development (includes up to 2 hours per week of outside-class service learning; may be taken at any time)	3
or EDUC 4411	Educational Psychology for Elementary Schools	
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of in-school practicum)	3
Total Credit Hours		9

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

EDUC 4513	Education and Practice (must be taken with EDUC 4732)	2
EDUC 4732	Student Teaching K-12 (pass/fail only)	8
MUSC 4193	Student Teaching Seminar	1
MUSC 4133	Student Teaching Practicum (optional; check with the College of Music)	3
Total Credit Hours		14

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5113) or PLACE (test 29).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

Secondary English Language Arts (7#12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Mathematics

Choose a 3-credit college-level course. 3

Advanced Writing

Choose a 3-credit course in critical or creative writing beyond the lower-division/introductory composition level. 3

History or Grammar of the English Language

Choose one course from the following: 3

EDUC 4222/5222 Language Study for Educators

CLAS/LING 1010 The Study of Words

LING 1500 Understanding Grammar

LING 2000	Introduction to Linguistics	
Oral Communication		
Choose a 3-credit course in speech, public speaking or communication.		3
Visual Communication		
Choose a 3-credit course in theatre, film, ATLAS, TAM or other digital media.		3
Literature		
Choose 30 credit hours in English and English language arts-related courses. Must include a component of British literature as well as a multicultural/non-English literature course. Acceptable course work may be in communication/speech, composition, drama/theatre, humanities, journalism and/or literature. May include courses from the content requirements above.		9
Total Credit Hours		54

Education Course Requirements

Take Any Time

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4112	Educational Psychology and Adolescent Development (includes up to 2 hours per week of outside-class service learning)	3

Fall Semester

EDUC 5325	Teaching Literature in Middle and Secondary Schools	3
EDUC 4295	Reading and Literacy in the Secondary Classroom (includes up to 5 hours per week of school-based practicum)	4
EDUC 4342	Writing in Humanities Classrooms (includes up to 4 hours per week of school-based practicum)	3

Spring Semester

EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
EDUC 5365	Methods and Materials in Secondary English (includes up to 5 hours per week of school-based practicum)	4

Total Credit Hours 23

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

Secondary Mathematics (7-12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

APPM 1350	Calculus 1 for Engineers	4
	or MATH 1300 Calculus 1	
	or MATH 1310 Calculus, Systems, and Modeling	
APPM 1360	Calculus 2 for Engineers	4
	or MATH 2300 Calculus 2	
APPM 2350	Calculus 3 for Engineers	4
	or MATH 2400 Calculus 3	
MATH 2001	Introduction to Discrete Mathematics	3
MATH 3001	Analysis 1	3
MATH 3110	Introduction to Theory of Numbers	3
	or MATH 3140 Abstract Algebra 1	
MATH 3120	Functions and Modeling	3
MATH 3510	Introduction to Probability and Statistics	3
MATH 2135	Introduction to Linear Algebra for Mathematics Majors	3
MATH 3210	Euclidean and Non-Euclidean Geometry	3
MATH 4820	History of Mathematical Ideas	3
Total Credit Hours		36

Education Course Requirements

Take Any Time

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4050	Knowing and Learning in Mathematics and Science (includes up to 2 hours per week of school-based practicum)	3

Semester One (Fall)

EDUC 2020	Step 1: Inquiry Approaches to Teaching ¹	1
	or EDUC 4610 Math and Science Education	
EDUC 5317	Perspectives on Mathematics	3

Semester Two (Spring)

EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4060	Classroom Interactions (includes up to 5 hours per week of school-based practicum)	3
EDUC 4232	Language and Literacy across the Curriculum (spring and summer only)	3

Semester Three

EDUC 5375	Problem-Based Math Instruction (includes up to 6 hours per week of school-based practicum)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
Total Credit Hours		23

¹ EDUC 4610 is restricted to students admitted to the Learning Assistant Program and is a variable-credit course.

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5161) or PLACE (test 04).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

Secondary Science (7-12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content, and education coursework. All grades must be a "C-" or better to satisfy a requirement.

Content Course Work Requirements

Mathematics

APPM 1350	Calculus 1 for Engineers	4
	or MATH 1300 Calculus 1	
	or MATH 1310 Calculus, Systems, and Modeling	

Science

Choose two biology courses.	6
Choose two chemistry courses.	6
Choose two earth/space science courses.	6
Choose two physics courses.	6

Complete three out of four of the following content area lab courses separately or as part of a course:

Biology Lab
Chemistry Lab
Earth/Space Science Lab

Physics Lab	
Total Credit Hours	28

Content Majors

- **Biology:** Complete a major in ecology & evolutionary biology; integrative physiology; molecular, cellular & developmental biology; or neuroscience (may include courses from the content requirements above).
- **Chemistry:** Complete a major in chemistry or biochemistry (may include courses from the content requirements above).
- **Earth/Space Science:** Complete a major in astronomy, atmospheric & oceanic sciences or geology (may include courses from the content requirements above). Please contact an education advisor for more information at 303-492-6555.
- **Environmental Science:** Complete a major in environmental studies (may include courses from the content requirements above). Contact an education advisor for more information at 303-492-6555.
- **Physics:** Complete a major in physics with Plan 3 (may include courses from the content requirements above). Students pursuing Plan 1 or Plan 2 in the physics major, or a major in engineering physics, should contact an education advisor at 303-492-6555.

Education Course Requirements

Take Any Time

EDUC 3013	School and Society (meets Arts and Science Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4050	Knowing and Learning in Mathematics and Science (includes up to 2 hours per week of school-based practicum)	3
EDUC 4232	Language and Literacy across the Curriculum (spring and summer only)	3
Choose two courses from the following:		6
EDUC 4811 & MCDB 4811	Teaching and Learning Biology and Teaching and Learning Biology	
EDUC 4822	Teaching and Learning Chemistry (spring only)	
EDUC 4460 & PHYS 4460	Teaching and Learning Physics and Teaching and Learning Physics	
EDUC/PHYS 1580	Energy and Interactions	
EDUC 4833	Teaching and Learning Earth Systems (fall only)	
GEEN 4400	Teaching Design	

Semester One

EDUC 2020	Step 1: Inquiry Approaches to Teaching ¹	1
or EDUC 4610	Math and Science Education	

Semester Two

EDUC 2030	Step 2: Inquiry-Based Lesson Design	1
EDUC 4060	Classroom Interactions (includes up to 5 hours per week of school-based practicum)	3

Semester Three

EDUC 5385	Problem-Based Science Instruction (includes up to 6 hours per week of school-based practicum)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3

Total Credit Hours	26
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¹ EDUC 4610 is restricted to students admitted to the Learning Assistant Program and is a variable-credit course.

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5081) or PLACE (test 06).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

Secondary Social Studies (7#12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Mathematics

Choose a 3-credit college-level course. 3

U.S. History

Choose 6 credits of college-level courses. 6

World History

Choose 6 credits of college-level courses. 6

Economics

Choose a 3-credit course in an economics department. 3

Political Science

Choose a 3-credit course in a political science department.

Cultural/Human Geography

Choose a 3-credit course in a geography department. Physical geography does NOT qualify. 3

Sociology or Social/Cultural Anthropology

Choose a 3-credit course in a sociology or anthropology department. Physical anthropology does NOT qualify. 3

Focus Area

Choose 30 credit hours in one of the following disciplines: anthropology, economics, ethnic studies, geography, history, international affairs or political science (may include courses from the content requirements above). A minimum of 12 credits must be upper division.

Total Credit Hours 24

Education Course Requirements

Take Any Time

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4112	Educational Psychology and Adolescent Development (includes up to 2 hours per week of outside-class service learning)	3
EDUC 5316	Nature of Social Studies and Social Studies Education (fall only; includes school-based practicum)	3

Fall Semester

EDUC 4295	Reading and Literacy in the Secondary Classroom (includes up to 5 hours per week of school-based practicum)	4
EDUC 4342	Writing in Humanities Classrooms (includes up to 4 hours per week of school-based practicum)	3

Spring Semester

EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
EDUC 5355	Methods and Materials in Secondary Social Studies (includes up to 5 hours per week of school-based practicum)	4

Total Credit Hours 23

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4712.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5081) or PLACE (test 06).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject specific assessment, with a score of 42 or higher.

World Languages

Secondary French (7#12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Students must complete 30 credits in French at the junior level or above. May include requirements from below.

Quantitative Reasoning & Mathematical Skills

Choose one course from the following:		3-6
MATH 1011	College Algebra	
MATH 1012	Quantitative Reasoning and Mathematical Skills	
MATH 1071	Finite Mathematics for Social Science and Business	
MATH 1081	Calculus for Social Science and Business	
MATH 1150	Precalculus Mathematics	
MATH 1300	Calculus 1	
APPM 1350	Calculus 1 for Engineers	
MATH 1110 & MATH 1120	Mathematics for Elementary Educators 1 and Mathematics for Elementary Educators 2	

French Core

FREN 3010	French Phonetics and Pronunciation	3
FREN 3050	French Composition 1	3
FREN 3060	French Composition 2	3
FREN 3100	Introduction to Critical Reading and Writing in French Literature	3
FREN 3110	Main Currents of French Literature 1	3
FREN 3120	Main Currents of French Literature 2	3
FREN 3500	French Current Events: Conversation and Composition	3

French Electives

Choose 6 additional credits at the 3100 level or above. 6

Total Credit Hours 30-33

Education Course Requirements

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4112	Educational Psychology and Adolescent Development (includes up to 2 hours per week of outside-class service learning)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (fall only; includes up to 5 hours per week of school-based practicum)	3
FREN 5770	Methods of Teaching French as a Foreign Language (fall only)	2

Total Credit Hours 14

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and FREN 4960.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and FREN 4960.
- FREN 4960 High School French Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5601) or PLACE (test 12).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary German (7#12) Teacher Licensure Program Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Students must complete a total of 30 credits in German and related fields. GRMN 4450 or GRMN 5020 may not count towards requirements.

Mathematics

Choose a 3-credit college-level mathematics course. 3

German Core

GRMN 2020 Intermediate German 2 4

GRMN 3010 Advanced German 1 3

GRMN 3020 Advanced German 2 3

GRMN 4010 Advanced Grammar and Stylistics 3

GRMN 4550 Senior Seminar: The Roles of Intellectuals and Academics in German Culture 3

GRMN 5020 Applied Linguistics and Foreign Language Teaching Methodology (Department permission required) 3

Complete one (1) of the following courses: 3

GRMN 4330 The Age of Goethe

GRMN 4340 Seminar in German Literature

Complete two courses from the following: 6

Courses taught in German

GRMN 3110 German Literature from the Avant-garde to the Postmodern

GRMN 3120 German Literature from the Enlightenment to Expressionism

GRMN 3140 Current Issues in German Literature

GRMN 3520 Open Topics in the Cultural Context

GRMN 4030

GRMN 4370

Courses taught in English

GRMN 1601 Germany Today

GRMN 1602 Metropolis and Modernity

GRMN 1603

GRMN 2501 Miniatures of Modern Life: Introduction to Short Fiction

GRMN 3201

GRMN 3501 German-Jewish Writers: From the Enlightenment to the Present

GRMN 3503 German Film Through World War II

GRMN 3504 Topics in German Film

GRMN 4501 Seminar: Literature in Cultural Context

GRMN 4502 Nietzsche: Literature and Values

GRMN 4503 Issues in German Thought

GRMN 4504 Goethe's Faust

Total Credit Hours 31

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013 School and Society (Meets the Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.) 3

EDUC 4112 Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.) 3

EDUC 4023 Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum) 3

EDUC 4125 Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.) 3

GRMN 4450 Methods of Teaching German 3
or GRMN 5020 Applied Linguistics and Foreign Language Teaching Methodology

Note: May not count GRMN 5020 for academic preparation in German (section C, item 6) and for methods.

Total Credit Hours 15

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513.
- GRMN 4460 High School German Teaching (6 credits). Pass/fail only. Must be taken concurrently EDUC 4513 & EDUC 4722.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5601) or PLACE (test 12).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Japanese (7#12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Quantitative Reasoning & Mathematical Skills

Choose one course or sequence from the following: 3-6

MATH 1011	College Algebra	
MATH 1012	Quantitative Reasoning and Mathematical Skills	
MATH 1071	Finite Mathematics for Social Science and Business	
MATH 1081	Calculus for Social Science and Business	
MATH 1150	Precalculus Mathematics	
MATH 1300	Calculus 1	
APPM 1350	Calculus 1 for Engineers	
MATH 1110 & MATH 1120	Mathematics for Elementary Educators 1 and Mathematics for Elementary Educators 2	

Japanese Core

JPNS 3110	Advanced Japanese 1	5
JPNS 3120	Advanced Japanese 2	5
JPNS 4110	Advanced Readings in Modern Japanese 1	3
JPNS 4120	Advanced Readings in Modern Japanese 2	3

Japanese Electives

Choose 12 additional upper-division credits in Japanese language, literature and/or culture, including 6 credits taken in the past five years.. 12

Total Credit Hours 31-34

Education Course Requirements

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirement for Human Diversity or Contemporary Societies)	3
EDUC 4112	Educational Psychology and Adolescent Development (includes up to 2 hours per week of outside-class service learning)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (fall only; includes up to 5 hours per week of school-based practicum)	3

Total Credit Hours 12

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722.
- EDUC 4712 Student Teaching: Secondary School (10 credits). Must be taken with EDUC 4513.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5601) or PLACE (test 12).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Latin (7#12) Teacher Licensure Program

Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Students must complete 30 credits in CLAS courses beyond introductory language courses, of which 18 must be upper division.

Quantitative Reasoning & Mathematical Skills

Choose one course or sequence from the following: 3-6

MATH 1011	College Algebra	
MATH 1012	Quantitative Reasoning and Mathematical Skills	
MATH 1071	Finite Mathematics for Social Science and Business	
MATH 1081	Calculus for Social Science and Business	
MATH 1150	Precalculus Mathematics	
MATH 1300	Calculus 1	
APPM 1350	Calculus 1 for Engineers	
MATH 1110 & MATH 1120	Mathematics for Elementary Educators 1 and Mathematics for Elementary Educators 2	

Latin Core

LATN 1014	Beginning Latin 1	4
LATN 1024	Beginning Latin 2	4
LATN 2114	Intermediate Latin 1	4
LATN 2124	Intermediate Latin 2	3

Latin Reading

Two additional 3-credit Latin reading courses above the sophomore level. 6

Latin Electives

Latin electives to meet the 30-credit-hour minimum in CLAS courses beyond introductory language courses. 6-3

Total Credit Hours 30

Education Course Requirements

Courses and Minimum Required Credit Hours

EDUC 3013	School and Society (Meets the Arts and Science Core requirement for Human Diversity or Contemporary Societies. May be taken at any time.)	3
EDUC 4112	Educational Psychology and Adolescent Development (Includes up to two (2) hours per week of outside-class service learning. May be taken at any time.)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (Includes up to four (4) hours per week of school-based practicum)	3
EDUC 4125	Secondary World Language Methods (Includes up to five (5) hours per week of school-based practicum. Fall only.)	3
LATN 4824 or LATN 5824	Latin Teaching Methods: Open Topics	3
Total Credit Hours		15

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits).
- EDUC 4712 Student Teaching: Secondary School (10 credits).

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5601) or PLACE (test 12).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Secondary Spanish (7#12) Teacher Licensure Program Grade Requirements

Teacher licensure candidates must maintain a 2.75 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Quantitative Reasoning & Mathematical Skills. Three (3) - six (6) credit hours. Complete one of the following options to satisfy this requirement: MATH 1011, MATH 1012, MATH 1071, MATH 1081, MATH 1150, MATH 1300, MATH 1410 (currently not offered), APPM 1350 or MATH 1110 AND MATH 1120

SPAN 3000	Advanced Spanish Language Skills	5
SPAN 3002	Advanced Spanish Conversation	3
SPAN 3050	Spanish Phonology and Phonetics	3
SPAN 3100	Literary and Cultural Analysis in Spanish	3
SPAN 3120	Advanced Spanish Grammar	3
Choose one of the following courses:		3
SPAN 3010	Advanced Rhetoric and Composition	

or SPAN 4430	Special Topics in Hispanic Linguistics	
or SPAN 4450	Introduction to Hispanic Linguistics	
Choose one of the following courses:		3
SPAN 4150	Major Works and Trends in Literature and Culture in Spain Up to 1700	
or SPAN 4160	Major Works and Trends in Literature and Culture in Spain: 1700-Present	
Choose one of the following courses:		3
SPAN 4170	Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century	
or SPAN 4180	Major Works and Trends in Literature and Culture in Latin America: 1900-Present	
Literature: One (1) additional 4000 level course in Spanish Literature.		3
Culture & Civilization—Peninsular or Spanish American: More courses may be available. Please contact an education advisor at 303-492-6555		3
Six (6) credit hours in a related field: Portuguese, Chicano Studies, Linguistics, another language (must be upper division), Comparative Literature, Political Science, or History.		6
Total Credit Hours		38

Education Course Requirements

EDUC 3013	School and Society (meets the Arts and Sciences Core Requirements for Human Diversity or Contemporary Societies)	3
EDUC 4112	Educational Psychology and Adolescent Development (includes up to 2 hours per week of outside-class service learning)	3
EDUC 4125	Secondary World Language Methods (fall only; includes up to 5 hours per week of school-based practicum)	3
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms (includes up to 4 hours per week of school-based practicum; should be taken concurrently with SPAN 4650.)	3
SPAN 4650	Methods of Teaching Spanish (should be taken concurrently with SPAN 4023.)	3
Total Credit Hours		15

Student Teaching

Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

- EDUC 4513 Education and Practice (2 credits). Must be taken with EDUC 4722 and SPAN 4660.
- EDUC 4722 Student Teaching: Secondary School 2 (5 credits). Must be taken with EDUC 4513 and SPAN 4660.
- SPAN 4660 High School Spanish Teaching (6 credits). Must be taken with EDUC 4513 and EDUC 4722.

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5601) or PLACE (test 12).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Engineering & Applied Science

The College of Engineering and Applied Science has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery and innovation, and community and culture. Our college is the top-ranked engineering school in the Rocky Mountain region, with 14 baccalaureate programs and 12 graduate programs.

Mission & Vision

The mission of the College of Engineering and Applied Science is to generate new knowledge in engineering and related fields and to equip students from diverse backgrounds as future leaders and responsible citizens in these fields for the betterment of individuals and society. Its vision is to be a world leader in engineering research and education, with an emphasis on integrated and discovery learning and on engineering for global society.

The college embraces the following core values:

- **Global Society:** Our innovative research programs seek to create and disseminate knowledge to improve global society in areas such as health and well-being, energy and environmental sustainability and infrastructure for both developed and developing communities. Similarly, our innovative educational programs seek to prepare graduates with not only technical knowledge and excellence, but also skills for societal leadership and global citizenship.
- **Active Learning:** We design the student experience based on engineering educational research findings that demonstrate enhanced learning through active engagement of students, both within the classroom and through personalized and team-based opportunities such as design projects, discovery learning, service learning, internships and leadership programs.
- **Inclusive Excellence:** To improve the educational experience and better serve global society, we are committed to building a culture of inclusive excellence of diverse faculty, staff and students with high ethical and performance standards.

The college seeks the following outcomes in our graduates:

- technical excellence and knowledge in modern engineering, mathematics and science
- ability to communicate effectively with diverse peoples and other cultures
- ability to think critically, analyze data and formulate and solve complex problems
- ability to contribute effectively as individuals and in multidisciplinary teams
- knowledge of contemporary issues and preparation for societal leadership and world citizenship

- desire and skills for lifelong learning and personal and professional development
- passion for serving others and commitment to sustainability

Degrees

The College of Engineering and Applied Science offers Bachelor of Science degrees in:

1. aerospace engineering sciences (p. 630)
2. applied mathematics (p. 637)
3. architectural engineering (p. 672)
4. chemical engineering (p. 649)
5. chemical and biological engineering (p. 647)
6. civil engineering (p. 674)
7. computer science (p. 689)
8. electrical engineering (p. 712)
9. electrical and computer engineering (p. 710)
10. engineering physics (p. 728)
11. engineering plus (p. 732)
12. environmental engineering (p. 676)
13. mechanical engineering (p. 740)
14. technology, arts and media (p. 745)

Accreditation

The CU Boulder campus is accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools. Programs numbered 1, 3–6, 8–9 and 12–13 are accredited by the Engineering Accreditation Commission (EAC) of ABET (<http://www.abet.org>). Engineering Plus is a new degree program for which ABET EAC accreditation will be sought. The Computer Science degree is accredited by the Computing Accreditation Commission (CAC) of ABET. The degrees in applied mathematics and engineering physics are offered in cooperation with the departments of Department of Applied Mathematics (p. 153) and Department of Physics (p. 446) in the College of Arts and Sciences (p. 121); accreditation by ABET is not usually sought in these areas.

Professional Registration

Professional registration is recommended for all fields of engineering in order to protect the health, safety and welfare of the public. Registration is required in all states for the legal right to practice professional engineering. Although there are variations in state laws regarding engineering licensure, there is a general four-step process for licensure candidates: earn a degree from an EAC/ABET-accredited engineering program, pass the FE exam, gain acceptable work experience under the supervision of a PE, and pass the PE exam. Students typically take the FE exam during their senior year in college.

Centers & Communities

BOLD Center

The BOLD (Broadening Opportunity through Leadership and Diversity) Center focuses the college's inclusion-centered access, retention and performance initiatives. The BOLD Center creates a vibrant and inclusive community of students from a wide range of backgrounds, preparing engineers with diverse perspectives to be innovative leaders in a global society. Through BOLD-inspired and -led initiatives, the college is dedicated to becoming a leader in attracting, preparing and expanding

opportunities for students historically underrepresented in engineering—including women, racial minorities, students from low-income families and those who are the first in their family to attend college. The BOLD Center team focuses deeply on measurable outcomes to significantly improve upon historical student access, retention and performance results.

BOLDly Moving Forward. The BOLD Center achieves breakthroughs in attracting, preparing and expanding opportunities for historically underrepresented students in engineering through academic offerings that inspire and motivate student success. Building strong community among students who might otherwise feel isolated is also a BOLD key to student success. BOLD promotes student engagement, achievement and retention in engineering through a focus on community building, leadership and professional development activities, coupled with building strong academics and an expectation for achieving excellence.

Why be BOLD? Through the inclusive BOLD community, students meet and work with peers, connect with engineering student societies, tap into internships and mentoring opportunities, explore career services, acquire effective study habits and pursue volunteer opportunities. The BOLD Center offers free tutoring for all engineering students in the Student Success Center. BOLD participation scholarships are available through an application process.

For more information, visit the BOLD Center (<http://www.colorado.edu/bold>) website.

Mortenson Center in Engineering for Developing Communities

Engineering for Developing Communities (EDC) is an innovative program dedicated to transforming the understanding, application, and evaluation of engineering to address some of the world's most pressing issues. The engineers of today need to work with colleagues in various disciplines from around the world to find locally appropriate solutions to global issues such as climate change, crumbling urban infrastructure, and adequate water and food supplies for a growing world population. By giving students tools in understanding systems perspectives, development theory, and contexts from local to global, the program helps create global citizen engineers capable of working in many roles in development engineering.

For more information, visit the Mortenson Center in Engineering for Developing Communities (<http://www.colorado.edu/mcedc>) website.

Residential Communities

The Engineering Honors Residential Academic Program, the Global Engineering Residential Academic Program, and the Quadrangle Engineering Living and Learning Community are popular community-building options for engineering students.

Engineering Honors Residential Academic Program

As a residential college (RC) housed in Andrews Hall, the Engineering Honors Program provides an educational experience that transcends the classroom and matches the unique abilities, needs and ambitions of this select group of students. The program is for students who want to help build an honors culture that cares more about learning than grades; more about maximizing opportunities than meeting minimum requirements; and more about being thoughtful, critical, engaged and intentional than being passively defined by the vague expectations of others. Central to fulfilling this mission is the Engineering Honors Program Residential College in Andrews Hall, which includes a residential faculty member,

classrooms, special study spaces and the highest percentage of upper-division students living on campus.

Being part of EHP means belonging to a community that is ambitious without being competitive and committed to a wide range of goals from international development work to graduate school, from research to teaching, and from industry to service. It means living next to students already doing research, returning from summer internships, working with Engineers without Borders and applying to graduate school.

Incoming first-year students are selected to participate in the Engineering Honors Program via an online application process. Although many EHP students live in Andrews for multiple years, it is only required during the first year.

For more information about program requirements and to access the application, visit the Engineering Honors Program (<http://www.cuhonorsengineering.com>) website.

Global Engineering Residential Academic Program

The Global Engineering Residential Academic College opened in Fall 2013 with the mission to provide a four-year educational experience for engineering students invested in foreign languages, culture and geopolitics as well as in global development and international design collaboration. Global Engineering emphasizes those aspects of education that take place outside the traditional classroom: belonging to a strong community, service opportunities, leadership training, peer mentoring and participating in the liberal arts. A Faculty Director in Residence is central to the community and interacts with all community members. Global Engineering is located in Kittredge Central, and includes a kitchen, special classrooms and study spaces, an engineering computer lab, a music room and multiple room designs to attract upper-division students. Students in global engineering are encouraged to speak Spanish, French and/or Russian in residence. Incoming students are selected each year via an online application process, both for incoming freshmen and for returning students on the CU Boulder Campus.

For more information and to access the application, visit the Global Engineering (<http://www.globalengineeringrap.org>) website.

Quadrangle Engineering Living and Learning Community

Adjacent to the Engineering Center, composed of Aden, Brackett, Cockerell and Crosman Halls, the Quad provides a supportive living environment for students studying engineering and applied sciences. Current offerings include a computer lab with engineering software, evening and Sunday drop-in tutoring, and special programs such as hands-on workshops with the Idea Forge, faculty dinners, trips to sporting and cultural events on campus and more. Students in the Quad report that they appreciate the convenient location, the additional academic resources, and always having friends in their hall to study with.

For more information, visit Housing & Dining Services' Get Involved (https://living.colorado.edu/get-involved?qt-get_involved_main_tab=0&qt-get_involved_rap_breakdown_level=2&qt-get_involved_llcs=1/#qt-get_involved_llcs) webpage and scroll down to the Quad Engineering Living & Learning Community section.

Areas of Interest

Active Learning Program

The College of Engineering and Applied Science defines active learning as "enhancing knowledge, skills and understanding through practical experience." The college's goal is to provide all students with the

opportunity to participate in enrichment experiences and partnerships with individual faculty and professionals in discovery, service and professional learning. Several programs are in place to financially support students engaged in undergraduate research or "discovery learning" with faculty, graduate students and research sponsors. Students seeking professional learning experiences such as internships and co-op assignments with a participating employer also typically earn hourly wages, while those pursuing service learning opportunities in the college, community or beyond could earn wages or course credit. Active learning encompasses domestic and international opportunities such as assisting developing communities through Engineers Without Borders, a national nonprofit organization started at CU Boulder.

For more information, visit the Active Learning Program (<http://www.colorado.edu/activelearningprogram>) website.

Colorado Space Grant Consortium

CU's Space Grant program provides interdisciplinary students with access to space through innovative courses and real-world, hands-on space hardware programs that include short and long-duration, high altitude balloon payloads, sounding rocket payloads and low-Earth orbiting satellite missions. NASA's Colorado Space Grant Consortium (also known as Space Grant) is part of a national program.

Space Grant students interact with engineers and scientists from NASA and industry to develop, test and fly new space technologies. All missions are entirely student run—including students in the roles of team members, team leads, systems engineers, project managers and mission operators. Students participate in programs that aid them in their future academic courses and careers.

For more information, visit the Colorado Space Grant Consortium (<http://spacegrant.colorado.edu>) website.

Engineering Leadership Program

The Engineering Leadership Program (ELP) provides students with course work and active learning experiences to prepare them to be leaders in their chosen careers, whether it is in an engineering field or another field such as government service, law, medicine, etc. Students in the program take leadership courses through ELP and other CU programs, attend leadership seminars sponsored by the college and learn from mentors who have experience relevant to their interests. ELP Students also design and undertake a personal leadership experience and produce a portfolio of their ELP work for review prior to graduation. Students apply to the program in their first or second year.

For more information, visit the Engineering Leadership Program (<http://www.colorado.edu/engineeringleadershipprogram>) website.

Engineering Study Abroad

In today's global environment, engineers can expect to work in multilingual and multicultural teams and to engage in projects with global impact. It is therefore essential that students develop global engineering competencies alongside their technical skills, either through careful selection of globally oriented courses or through international experiences such as study abroad.

The College of Engineering and Applied Science has partnered with CU's Education Abroad Office to provide engineering students with numerous global opportunities. Students can study engineering at more than 25 universities across six continents, and more than 1800 courses have been preapproved for engineering credit.

Additionally, the college is adding technically oriented global seminars each summer to allow students to study engineering within a global context and under the tutelage of a CU professor.

Careful planning is required to ensure that the courses taken abroad meet degree requirements and that participants stay on track for graduation. All participants in CU-approved study abroad programs remain enrolled at the university and receive in-residence credit; the pass/fail grade option is used by the college for course work taken during study abroad but is exempt from college and major department pass/fail limitations. CU financial aid, including most scholarships, can usually be applied to program costs, and special study-abroad scholarships may be available for program participants.

Engineering students interested in studying abroad must begin planning early and are advised to save as many HSS and technical elective courses as possible, as these are the easiest to transfer back to CU.

For more information, visit the college's International Programs (<http://www.colorado.edu/engineering-international>) website.

Herbst Program of Humanities

The Herbst Program of Humanities enriches and broadens the education of engineering students with seminar and lecture courses in literature, philosophy, history, social issues and the arts.

In its two seminars, HUEN 1010 and HUEN 3100, class time is devoted almost exclusively to roundtable discussion of original texts in literature, philosophy, and the fine arts. These seminars have fewer than 14 students, so students can hone their critical thinking skills through reading, discussion and extensive writing. Both of these seminars satisfy the college's writing requirement. Note: HUEN 1010 satisfies the writing requirement only when taken in a student's freshman year.

The Herbst Program offers various lecture courses on a rotating basis. Engineering in History: The Social Impact of Technology (HUEN 1850) studies technological change and its consequences through time. HUEN 2100, HUEN 2120 and HUEN 2130 together survey science and technology from the Stone Age to the 20th century. Engineering, Science, and Society (HUEN 2210) explores the ethics and social implications of engineering practice. Special topics courses are occasionally offered (HUEN 2843 or HUEN 3843); these address subjects as varied as world folklore, the ethics of bioengineering, and the relationship between science and religion. The Herbst Program also offers summer and study abroad courses.

Clancy and Linda Herbst founded and endowed the program in 1989 and continue to sustain it; it is also supported by the Price Foundation, the Engineering Excellence Fund, CEAS and many friends and alumni.

For more information, visit the Herbst Program of Humanities in Engineering (<http://www.colorado.edu/herbst>) website.

Idea Forge

The Idea Forge is a flexible, cross-disciplinary collaborative space where students can imagine, design, create, and test products and solutions to meet a range of societal and customer needs. The space serves as the home for Design Center Colorado and Catalyze CU. It supports student teams working on invention and innovation as part of courses, as well as design and development driven by entrepreneurial-minded individuals and service-oriented groups. With all these students working side-by-side, the Idea Forge boosts student learning through collaborative, hands-

on experience, while supporting industry interaction through scheduled workshops as well as spontaneous exchanges.

The mission of the Idea Forge is to enhance interdisciplinary creativity and synergy to develop flexible, adaptable, and practical graduates. To do this, the Idea Forge supports design from a variety of perspectives, from the most formal engineering design process to the human-centered design philosophy. By providing students the opportunity to design, build, and test their concepts, the Idea Forge builds creative confidence and promotes the formation of strong professional skills.

The Idea Forge boasts a variety of flexible spaces to achieve its mission and to fit individual student needs. These spaces fit into three categories: fabrication shops, project space, and community space. The fabrication shops provide students with the tools and equipment needed for prototyping through machining, welding, 3D printing, laser cutting, woodworking, and sewing with an additional emphasis on electronics and micro-controllers. Students learn safe, efficient use of the tools and equipment through action, by taking workshops or tackling a project. Project spaces fill the Idea Forge – students are able to find their nearest wood-topped workbench to assemble their design. The central Idea Forge Commons, an inspiring environment for teamwork and brainstorming, doubles as a project space and a community space. Just off the Commons, the Thinking Lounge community space provides students with a comfortable place to take a break. Additional community space consists of two impressive conference rooms, which are perfect for meetings with industry and community members.

For more information, visit the Idea Forge (<http://www.colorado.edu/ideaforge>) website.

Integrated Teaching and Learning Program

The Integrated Teaching and Learning (ITL) program provides K–16 engineering education initiatives aimed at supporting the teaching and learning of hands-on, minds-on engineering curriculum so that students of all ages can imagine a future in engineering. With a focus on engineering design, undergraduate engineering students have the ability to create what they dream via modern manufacturing and electronics capabilities—reinforced through innovative engineering courses, as well as through time set aside for the creation of personal projects to expand one's creative thinking.

Through ITL Program skill-building workshops on tools, machining, soldering, circuits, strain gauges, laser cutters, Arduino microcontrollers, LabVIEW, SolidWorks, spatial visualization and more, students become comfortable with the resources that help them do the engineering that impacts everyday life. The multidisciplinary, hands-on ITL Laboratory features two open and interactive laboratory plazas that support inquiry-based experimentation, data acquisition and analysis capability. The laboratory also hosts design studios, team work areas, active learning spaces—all designed to be used by all disciplines of CU engineering students as they do engineering.

The ITL Program's nationally recognized K–12 engineering education program focuses on attracting and preparing more diverse and well-prepared youth to careers in engineering and technology. K–12 audiences may visit the ITL Laboratory to learn how engineering is an essential part of their lives through myriad hands-on science and engineering exhibits. K–12 teachers and students can also access the TeachEngineering digital library, a free online curricular resource supporting educators to bring engineering into their K–12 classrooms through high quality engineering lessons and hands-on activities aligned to science, mathematics and technological educational standards. Accessed by over

1.6 million unique users in the past year, TeachEngineering has become a key resource to the broad national STEM movement and the growing K–12 engineering community.

The ITL program features an innovative interdisciplinary undergraduate curriculum that includes the retention-building First-Year Engineering Projects course that engages student teams to experience the design process in a hands-on way, culminating in an end-of-semester public design expo. The ITL Program also supports the design courses that distinguish the Engineering Plus degree program.

For more information, visit the Integrated Teaching & Learning Laboratory (<http://itll.colorado.edu>) website.

Pre-Engineering Program

The pre-engineering program is designed to facilitate the successful transition of qualified first-year students in the College of Arts and Sciences into the College of Engineering and Applied Science. The program provides a structured pathway of CU Boulder course work combined with academic advising support from both the College of Engineering and Applied Science and the College of Arts and Sciences.

The program serves qualified first-time freshmen applicants who initially applied to the College of Engineering and Applied Science, but were alternatively offered admission to the College of Arts and Sciences pre-engineering program. Pre-engineering students prepare for a transition to the engineering college by successfully completing specific math, science and engineering courses. Minimum grade, credit, and GPA requirements must be met to secure the transition from pre-engineering to engineering. Through special registration access to select engineering courses, most students can complete engineering admission requirements in three semesters, while some may do so in as few as two semesters. The maximum length of time in the pre-engineering program for any student is four semesters, at which point the student will either be admitted to engineering or will transition into an arts and sciences major. Pre-engineering students receive dual support from advisors in both the College of Engineering and Applied Science and the College of Arts and Sciences. They are also encouraged to live on campus in engineering-affiliated living communities and actively engage in engineering student societies and organizations.

For more information, visit the Pre-Engineering Program (<http://www.colorado.edu/pre-engineering>) website.

Policies & Requirements

Admission

Freshman Applicants

When students apply to the College of Engineering and Applied Science from high school, they may indicate to enter the college as "open option" (unsure of engineering major), or they may select a preliminary engineering major. Sometime after completion of the first semester, and by the eighth week of the second semester, all students should finalize and confirm their choice of major (<http://www.colorado.edu/engineering-advising/get-your-degree/first-year-freshmen/confirming-your-major>) in the College.

Specific admission requirements are detailed in the Admissions (p. 97) section of this catalog. Contact the campus Admissions Office (<http://www.colorado.edu/admissions>) for more information.

Transfer Students

Students desiring to transfer (<http://www.colorado.edu/engineering/future-students/transferring-cu>) from other accredited collegiate institutions are considered for admission on an individual basis. All transfer students are expected to be enrolled as full-time students and must be admitted to the college prior to the last 45 credit hours of their degree program. Admission criteria for students at other CU campuses are the same as for other transfer students.

Intrauniversity Transfer Students - Intrauniversity transfers (IUTs) (<http://www.colorado.edu/engineering-advising/transfer-within-cu>) on the Boulder campus to the College of Engineering and Applied Science are considered on designated criteria. The applicant's academic record must fulfill the IUT admissions requirements of the College of Engineering and Applied Science.

Former Students

A former student is expected to meet the current requirements outlined in the Admissions (p. 97) section of this catalog and must reapply to the university. Courses taken at other collegiate institutions may or may not be a determining factor in the student's readmission to CU Boulder, but transcripts on all such work must be submitted.

Interruption of studies may require completion of current degree work in addition to repetition of course work for new degree requirements.

A former student returning to the College after a break in attendance must have course work reevaluated by the student's major department/program if it is older than 10 years from the date of their return.

Minimum Academic Preparation Standards (MAPS)

All students entering the University of Colorado who finished high school in the spring of 1988 or after must meet minimum academic preparation standards (MAPS) specified by each school or college. The College of Engineering and Applied Science has adopted the following standards for students. These standards are defined in high school units; a unit is one full year of high school course work:

- **English:** 4 units
- **Mathematics:** 4 units (includes at least 2 of algebra, 1 of geometry and 1 of college preparatory math such as trigonometry, analytic geometry or elementary functions)
- **Natural Science:** 3 units (2 of physics AND 1 of biology or chemistry; **OR** 2 of chemistry AND 1 of physics or biology; **OR** 2 of biology AND 1 of chemistry or physics; **OR** 1 of physics AND 1 of chemistry or biology AND 1 of another science)
- **Social Science:** 3 units (includes at least 1 unit of U.S. or World History)
- **Foreign Language:** 3 years of the same foreign language or 2 years in each of two different foreign languages

For additional information, see the Admissions (p. 97) and MAPS (p. 113) sections of this catalog.

Academic Excellence

Dean's List

An undergraduate student in the College of Engineering and Applied Science who completes at least 12 credit hours of course work for a letter grade during the fall or spring semester on the Boulder campus, and who earns a semester grade point average (GPA) of at least 3.600, will be included on the college dean's list for that semester. Notation of "Dean's

List" is placed on the student's transcript, and is viewable at the end of the semester in which the designation is earned.

Honors at Graduation

Undergraduate students may be eligible for honors designations at graduation (<http://www.colorado.edu/engineering-advising/get-your-degree/graduation/honors-graduation>).

Engineering Scholarships

Undergraduate scholarships are provided by public funds and private donations by alumni, corporations and friends of the college. In some cases, endowments have been established; other scholarships are based on annual gifts. Some companies provide matching funds for gifts from their employees who are alumni.

For additional information about engineering college-specific scholarships (<http://www.colorado.edu/engineering/future-students/financial-aid-scholarships>), contact the College's Scholarship Coordinator at 303-735-2440.

Anyone interested in providing an undergraduate scholarship or contributing to the scholarship fund may contact:

Engineering Advancement
University of Colorado Boulder
422 UCB
Boulder, CO 80309-0422
303-492-7899

Academic Standards

Academic Policies

Students in the College of Engineering and Applied Science must abide by all College policies and procedures as outlined on the College's Advising web site (<http://www.colorado.edu/engineering-advising>), such as Academic Expectations and Policies (<http://www.colorado.edu/engineering-advising/get-your-degree/academic-expectations-policies>). Students should refer to these webpages often since policies, procedures, and forms may be updated throughout the academic year.

Academic Integrity

Students in the College of Engineering and Applied Science may be required to pass an academic integrity quiz. See also the campuswide Honor Code (<http://honorcode.colorado.edu>) website.

Academic Standing

Visit the College's Academic Standing (<http://www.colorado.edu/engineering-advising/academic-standing-0>) webpage for details on good academic standing, academic alert, academic recovery, and academic suspension.

Attendance

Successful work in the College of Engineering and Applied Science is dependent upon regular attendance in all classes. Students who are unavoidably absent should make arrangements with instructors to make up the work missed. Non-attendance does not constitute withdrawal from a class. *If students stop attending a class in which they are formally enrolled, they are likely to receive a failing grade (F).* All students are expected to be enrolled full time and must petition to be enrolled part time.

Registration and Enrollment

To ensure the prompt completion of degree requirements and satisfaction of the four-year guarantee, the undergraduate student is expected to register for, and complete each semester, a full-time course load as outlined in the relevant major department/program curriculum. All students are expected to be enrolled full-time and must petition to be enrolled part-time. Part-time enrollment (less than 12 credit hours) will negatively impact the student's financial aid and scholarships, and is likely to negatively impact student health insurance, on-campus housing, and the four-year graduation guarantee. Students must also petition to be enrolled in more than 19 credit hours in any given semester.

Sequence of Courses

Students are expected to follow the curriculum recommended by their major department/program.

A student who receives a grade of D+ or lower in a course that is prerequisite to another may not enroll in the succeeding course without an approved petition from the student's major department/program, the instructor of the succeeding course and the dean's office. (Check with the major department/program for more stringent requirements on prerequisite course grades.)

All courses are not necessarily offered each semester. According to college policy, undergraduate courses having an enrollment of fewer than 20 students may be cancelled. Students can minimize scheduling problems by closely following the curricular sequence recommended by their major department/program. If a course is unavailable, a student may petition to enroll for equivalent study.

Add and Drop Policies

See the Office of the Registrar web site (<http://www.colorado.edu/registrar>) for campuswide add and drop policies, and specific deadline dates for a given semester/term.

Engineering students may not enroll in more than 19 credit hours in a semester (17 credit hours for first-semester students) without an approved college petition.

After the final drop deadline, students must file a detailed college petition to request a late drop, which may be approved under the following conditions:

- After the tenth week of class, a student may be approved to late drop a course if they had not previously attended or participated in the course, handed in homework or taken any examinations. Course instructor approval is required.
- After the tenth week of class, a student may be approved to late drop a course only with documentation to verify circumstances beyond their control or a university error. Course instructor approval is required.

Students are responsible for being aware of the consequences of a late drop(s), including impacts on financial aid/scholarships, health insurance, on-campus housing eligibility, academic progress towards degree requirements, etc.

Withdrawal from the University

Withdrawal is the term used when a student wishes to drop all classes in a given semester/term. See the the Office of the Registrar web site (<http://www.colorado.edu/registrar>) for campuswide withdrawal deadlines and procedures.

If a student withdraws, college permission may be required for re-enrollment. Students who interrupt their course of study may be required to complete all current degree requirements and to repeat courses previously completed.

Repeating Courses

A student may not enroll more than three times in a course that applies towards degree requirements; furthermore, after the third attempt, a student may not substitute an equivalent course. This means that a student has a maximum of three opportunities to show sufficient mastery of a particular subject area, whether the course is from CU Boulder or through another collegiate institution. Furthermore, the most recent occurrence of the subject is the grade which is applied (e.g., to meet a grade required for a prerequisite course). If a student has earned AP or IB college credit and then subsequently enrolls in that course content, the later grade is applied. All grades will be employed to calculate grade point averages, including any courses which are repeated. Students are not to register for courses in which they already have received a final grade of C- or higher (unless their degree program requires a higher grade in the course).

Incompletes

Incomplete grades are given only when students, for documented reasons beyond their control, are unable to complete course requirements. A substantial amount of work must have been satisfactorily completed before approval for such a grade is given. An Incomplete Grade Record Form (<http://www.colorado.edu/engineering-advising/content/incomplete-grade-form>) must be completed by the instructor and student. In addition to reflecting the course and term taught, it also states what work must be completed to award the final grade and when the work must be finished (not to exceed one year). Incomplete grades are not calculated into the GPA. If a student does not complete a course assigned an Incomplete grade within one year, the Incomplete grade will automatically convert to an F grade. Students cannot repeat an equivalent course at another campus of the university or at another institution and expect the CU-Boulder grade of "I" to be removed, changed, or excluded from conversion to an F. A student is expected to complete any course with an "I" grade and not to re-enroll in a course in which a grade of "I" was awarded. Once the work has been completed, the instructor must complete and submit a Change of Record form. However, it is the student's responsibility to verify that the grade change was processed and is reflected properly on the transcript.

Credit Policies

Advanced Placement (AP)

College credit may be granted on the basis of scores earned on the College Board's Advanced Placement (AP) exams. The Admissions Office maintains a chart showing what AP exam scores must be earned to receive college credit (p. 106).

International Baccalaureate (IB)

College credit may be granted on the basis of International Baccalaureate (IB) program exam scores. The Admissions Office maintains a chart showing what IB exam scores must be earned to receive college credit (p. 107).

College-Level Examination Program Credit

College credit may be granted for select College-Level Examination Program (CLEP) examinations. The Admissions Office maintains a list of eligible CLEP exams and the minimum score required to earn college credit (p. 111).

Credit for Reserve Officers Training Corps (ROTC)

Up to 6 credit hours of approved ROTC courses may be counted toward a student's degree requirements in the humanities/social sciences. These approved courses may be found at www.colorado.edu/engineering/academics/policies/hss (<http://www.colorado.edu/engineering/academics/policies/hss>). With written approval from the student's major department/program, additional ROTC credit hours may be applied as free electives and/or technical professional electives.

No Credit Restrictions

In the College of Engineering and Applied Science, courses required for fulfillment of graduation requirements *cannot be taken for no credit (NC)*. Once a course has been taken for no credit, the course cannot be repeated for credit. Engineering students must petition for approval before enrolling for any course NC.

Pass/Fail Option

The primary purpose for offering courses on a pass/fail grading option is to encourage students to broaden their educational experience by selecting elective courses with this grade option without serious risk to their academic record. Individual departments may have rules that should be checked before registering for the pass/fail option. The college pass/fail policy is:

1. The maximum number of credit hours a student may elect with the pass/fail option shall be designated by the student's major department/program, but no more than 16 hours of pass/fail credit can be applied toward degree requirements. (Study abroad pass/fail credit hours are exempt from this limitation.)
2. Students should obtain advance approval via petition prior to selecting the pass/fail option using the College Petition Form. Course work taken pass/fail without appropriate approval may be reverted to the letter grade earned.
3. All students who wish to register for the pass/fail option in a fall or spring semester must do so by the third Friday after classes begin.
4. Students on academic recovery may not elect the pass/fail grade option.

Transfer Credit

After a prospective transfer student has been admitted, the Office of Admissions issues a transfer credit evaluation listing those courses acceptable for transfer by University of Colorado Boulder standards. A copy of this evaluation is made a part of the student's college record. The student's major department/program will then indicate which of those courses are acceptable in meeting engineering degree requirements. It is the responsibility of the transfer student to request final validation of the transfer credit hours by the major department/program and confirm that this validation is noted in the student's record.

If at any time a student wishes to have a course not previously accepted reconsidered for transfer, the student should consult with the faculty transfer credit evaluator in their major department/program to determine if petitioning for credit is in order.

Nontransferable Credit Hours

Students desiring to transfer credit hours from engineering technology programs should note that such credit hours are accepted only upon submission of evidence that the work involved was fully equivalent to that offered in this college.

Some technology courses are taught with titles and textbooks identical to those in similar engineering courses. These courses may still not

be equivalent to engineering courses because the areas of academic emphasis are divergent.

In order to assist engineering technology students with transfer problems, the following guidelines have been established:

1. Courses on basic subjects such as mathematics, physics, foreign languages, literature or history may be acceptable for transfer credit if they were taught as part of an accredited program for all students and were not specifically designated for technology students.
2. Students who have taken courses with technology designations that may be valid equivalents for engineering courses have these options:
 - They may petition for permission to waive the course requirement. The course requirement can be waived if students demonstrate that, by previous course work, individual study or work experience, they have acquired the background and training normally provided by the course. No credit is given for a waived course, but students may benefit from the waiver by being able to include more advanced work in their curriculum. A student will need to substitute an equivalent number of credit hours (approval by major department/program and college required). Other students may profit by repeating the course at this college and thus establishing a fully sound basis for what follows.
 - The appropriate University of Colorado Boulder academic department may recommend to the dean's office that credit be transferred to count toward the requirements for a related course in its curriculum. Credit cannot be given for vocational/technical or remedial courses under rules of the university.
 - The student may seek credit for the course by examination, if available, and the student pays the appropriate fee.

For more information on transfer of credit policies, see Transfer of College-Level Credit (p. 111) in the Admission section of this catalog.

Petition Policy

A student desiring a waiver of college or department/program policies must request and secure approval for this waiver through a petition procedure. Petitions (<http://www.colorado.edu/engineering-advising/forms>) are first presented to the student's major department/program for review, followed by review at the dean's office. It is the student's responsibility to obtain official notification of the petition decision from the dean's office.

Final Grade Appeal

If a student (rostered in any college/school on campus) wishes to appeal the final grade in a course offered by a College of Engineering and Applied Science academic unit, refer to the College's official grade appeal policy and procedures (<http://www.colorado.edu/p17ac5aa8dc5/rules-policies/grade-appeal-policy>).

Academic Advising

Students are advised by professional staff advisors (<http://www.colorado.edu/engineering-advising>) and faculty mentors from their respective major department/program, typically at least once a semester. Students use MyCUHub (<http://www.colorado.edu/mycuhub>) to communicate with advisors, schedule appointments, explore majors, etc.

Premedical Option

Students interested in meeting requirements for entry into medical or other health professions schools while earning a degree in engineering

should consult with a prehealth advisor (<http://www.colorado.edu/career/exploring-interests/interest-areas/pre-health>). Students should also discuss their plans with their primary academic advisor, since some of the required course work may fulfill electives in their engineering curriculum.

Four-Year Graduation Guarantee

For academically prepared freshmen who do not wish to extend their studies beyond eight semesters, the University of Colorado extends a guarantee (<http://www.colorado.edu/engineering-advising/get-your-degree/graduation/four-year-graduation-guarantee>) that required or essential courses, or acceptable alternative courses, will be available to allow each student to complete all course work required for a bachelor of science degree from the College of Engineering and Applied Science no later than the end of eight consecutive semesters of full-time enrollment. In the event the University of Colorado is not successful in meeting the terms of this guarantee, the university will reimburse the student all tuition and course fees for those courses remaining to successfully complete the previously designated bachelor of science degree.

Degree and Graduation Requirements

To be eligible for any of the baccalaureate degrees from the College of Engineering and Applied Science, students must meet graduation requirements (<http://www.colorado.edu/engineering-advising/get-your-degree/graduation-requirements>). Students should run an online degree audit and meet with their academic advisor to discuss progress towards degree requirements, and then when appropriate, apply for graduation on MyCUInfo according to timelines provided by the College, Graduate School, and/or the Registrar's Office.

Dual Degrees

A student in the College of Engineering and Applied Science may be able to obtain two degrees in engineering, or obtain one degree in engineering and obtain one in another field, such as business, music or one of the arts and sciences disciplines. Full degree requirements must be met for each degree program.

Programs of Study

Aerospace Engineering Sciences

Aerospace Engineering Sciences prepares students for successful and rewarding careers in aerospace and other high-tech industries, national research laboratories, government services, and academia. This program provides students unique opportunities to develop in-depth technical knowledge, effective communication skills, and a systems engineering perspective that enables them to develop creative solutions to complex problems. The curriculum encompasses core aerospace subjects including fluids, thermodynamics, dynamics, orbital mechanics, structures, and systems; design of air and space vehicles; and exciting multidisciplinary applications including bioastronautics, unmanned systems, remote sensing, and GPS.

The mission of the Department of Aerospace Engineering Sciences (<http://www.colorado.edu/aerospace>) is to provide quality education, including hands-on learning, and to conduct foremost research in aerospace engineering sciences. These goals are accomplished through fundamental and multidisciplinary research and by preparing aerospace engineering students to meet the needs of 21st-century society through the conception, design, and application of aerial and spacecraft systems.

The department is uniquely characterized by:

- blending aeronautics, astronautics, and science applications;
- providing an undergraduate experience characterized by rigorous preparation in mathematics and engineering sciences, a hands-on experiential approach to learning, and an extensive emphasis on design in a systems context;
- emphasizing in our graduate education and research programs forefront aerospace technology development and the integration of engineering and science activities to solve critical problems in the earth and space sciences; and
- creating graduates who are broadly educated, interdisciplinary, agile, team-oriented engineers and scientists, with end-to-end mission and systems perspectives.

Educational Objectives

During their first three to five years after graduation, Aerospace Engineering Sciences graduates will have:

- established themselves in professional careers or received a graduate degree;
- demonstrated ethical leadership, project management and/or innovation; and
- played significant roles in the research and development of engineering systems and products.

Desired Outcomes

Students completing the undergraduate degree in aerospace engineering will be knowledgeable in the following areas:

- the professional context of the practice of aerospace engineering and expectations of new graduates in aerospace engineering organizations, including an awareness of ethics issues, economics, and the business environment;
- the history of aerospace engineering, providing a perspective on current events;
- aerospace engineering as a highly multidisciplinary endeavor, requiring a systems perspective to integrate technologies and manage complexity; and
- major principles and scientific methods underlying the technologies comprising aerospace vehicles and systems.

Upon graduation, students will have developed the following general skills and abilities:

- strong written, oral, and graphical communication skills;
- an ability to quantitatively estimate, model, analyze, and compute;
- an ability to define and conduct experiments using modern laboratory instruments, and to interpret experimental results;
- an ability to seek out and gather information, enabling independent, and lifelong learning;
- interpersonal and organizational skills that enable individuals to work effectively in teams and assume leadership positions;
- an ability to identify needs, requirements, and constraints, and to design appropriate reliable engineering solutions;
- an ability to formulate technical problems clearly, and to correctly apply appropriate methods and procedures for their solution;
- an ability to program computers, and skills in the use of modern engineering analysis, simulation software and operating systems; and

- an ability to understand societal needs, business issues, and the ethical concerns and responsibility of the industry.

Course code for this program is ASEN.

Bachelor's Degree

- Aerospace Engineering Science - Bachelor of Science (BS) (p. 630)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Nisar Razzi (https://experts.colorado.edu/display/fisid_153237)
Assistant Professor; PhD, Cornell University

Akos, Dennis M. (https://experts.colorado.edu/display/fisid_131119)
Associate Professor; PhD, Ohio University

Argrow, Brian M (https://experts.colorado.edu/display/fisid_102860)
Professor; PhD, University of Oklahoma Norman Campus

Axelrad, Penina (https://experts.colorado.edu/display/fisid_100792)
Professor; PhD, Stanford University

Biringen, Sedat (https://experts.colorado.edu/display/fisid_105974)
Professor; DSc, Universite Libre de Bruxelles (Belgium)

Brasseur, James Gordon (https://experts.colorado.edu/display/fisid_156801)
Research Professor; PhD, Stanford University

Cash, Webster C (https://experts.colorado.edu/display/fisid_101759)
Professor; PhD, University of California-Berkeley

Chu, Xinzhaoh (https://experts.colorado.edu/display/fisid_141893)
Professor; PhD, Peking Univ (China)

Clark, Torin K (https://experts.colorado.edu/display/fisid_155959)
Assistant Professor; PhD, Massachusetts Institute of Technology

Correll, Nicolaus J (https://experts.colorado.edu/display/fisid_147555)
Assistant Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Culp, Robert D.
Professor Emeritus

Doostan, Alireza (https://experts.colorado.edu/display/fisid_147382)
Associate Professor; PhD, Johns Hopkins University

Emery, William J (https://experts.colorado.edu/display/fisid_106038)
Professor; PhD, University of Hawaii at Manoa

Evans, John A (https://experts.colorado.edu/display/fisid_152970)
Assistant Professor; PhD, University of Texas at Austin

Farnsworth, John A (https://experts.colorado.edu/display/fisid_153255)
Assistant Professor; PhD, Rensselaer Polytechnic Institute

Felippa, Carlos A (https://experts.colorado.edu/display/fisid_105701)
Professor; PhD, University of California-Berkeley

Forbes, Jeffrey M (https://experts.colorado.edu/display/fisid_100264)
Professor; PhD, Harvard University

Frew, Eric W (https://experts.colorado.edu/display/fisid_134685)
Associate Professor; PhD, Stanford University

Gerren, Donna Sue (https://experts.colorado.edu/display/fisid_108563)
Senior Instructor

Hamlington, Peter Edward (https://experts.colorado.edu/display/fisid_149800)
Assistant Professor; PhD, University of Michigan Ann Arbor

Humbert, James Sean (https://experts.colorado.edu/display/fisid_156202)
Associate Professor; PhD, California Institute of Technology

Hussein, Mahmoud Ismail (https://experts.colorado.edu/display/fisid_144300)
Associate Professor; PhD, University of Michigan Ann Arbor

Jansen, Kenneth E (https://experts.colorado.edu/display/fisid_147360)
Professor; PhD, Stanford University

Jones, Brandon A (https://experts.colorado.edu/display/fisid_149418)
Asst Professor Adjunct

Kantha, Lakshmi H (https://experts.colorado.edu/display/fisid_100231)
Professor; PhD, Massachusetts Institute of Technology

Klaus, David M (https://experts.colorado.edu/display/fisid_107103)
Professor; PhD, University of Colorado Boulder

Knipp, Delores Jane (https://experts.colorado.edu/display/fisid_147655)
Research Professor; PhD, University of California-Los Angeles

Koster, Jean N.
Professor Emeritus

Larson, Kristine M (https://experts.colorado.edu/display/fisid_105437)
Professor; PhD, University of California-San Diego

Lawrence, Dale A (https://experts.colorado.edu/display/fisid_104057)
Professor; PhD, Cornell University

Leben, Robert R (https://experts.colorado.edu/display/fisid_105118)
Research Professor; PhD, University of Colorado Boulder

Li, Xinlin (https://experts.colorado.edu/display/fisid_100016)
Professor; PhD, Dartmouth College

Marden, Jason R. (https://experts.colorado.edu/display/fisid_147582)
Associate Professor; PhD, University of California-Los Angeles

Marshall, Robert Andrew (https://experts.colorado.edu/display/fisid_155957)
Assistant Professor; PhD, Stanford University

Maslanik, James
Professor Emeritus

Matsuo, Tomoko (https://experts.colorado.edu/display/fisid_145041)
Assistant Professor; PhD, SUNY at Stony Brook

Maute, Kurt Karl (https://experts.colorado.edu/display/fisid_113875)
Professor; PhD, Univ of Stuttgart (Germany)

McGrath, Michael T (https://experts.colorado.edu/display/fisid_100133)
Professor Adjunct

McMahon, Jay W (https://experts.colorado.edu/display/fisid_150062)
Assistant Professor; PhD, University of Colorado Boulder

Nabity, James A. (https://experts.colorado.edu/display/fisid_153102)
Associate Professor; PhD, University of Colorado Boulder

Neogi, Sanghamitra (https://experts.colorado.edu/display/fisid_156773)
Assistant Professor; PhD, Pennsylvania State University

Nerem, Robert Steven (https://experts.colorado.edu/display/fisid_118478)
Professor; PhD, University of Texas at Austin

Palo, Scott E (https://experts.colorado.edu/display/fisid_109033)
Professor; PhD, University of Colorado Boulder

Pao, Lucy Y (https://experts.colorado.edu/display/fisid_107151)
Professor; PhD, Stanford University

Park, Kwang-Chun
Professor Emeritus

Schaub, Hanspeter (https://experts.colorado.edu/display/fisid_143818)
Professor; PhD, Texas AM University

Scheeres, Daniel J. (https://experts.colorado.edu/display/fisid_145035)
Distinguished Professor; PhD, University of Michigan Ann Arbor

Schwartz, Trudy L (https://experts.colorado.edu/display/fisid_108607)
Senior Instructor; MS, University of Colorado Boulder

Snyder, Howard
Professor Emeritus

Sternovsky, Zoltan (https://experts.colorado.edu/display/fisid_115211)
Associate Professor; PhD, Charles Univ, Prague (Czech Republic)

Stodieck, Louis S (https://experts.colorado.edu/display/fisid_105272)
Research Professor; PhD, University of Colorado Boulder

Thayer, Jeffrey P (https://experts.colorado.edu/display/fisid_134469)
Professor; PhD, University of Michigan Ann Arbor

Voss, James S (https://experts.colorado.edu/display/fisid_140891)
Scholar In Residence; MS, University of Colorado Boulder

ASEN 1000 (1) Introduction to Aerospace Engineering Sciences

Introduces aerospace history, curriculum, ethics, and the many areas of emphasis within aerospace engineering. Academic and industry speakers are invited to address various aerospace topics.

Requisites: Restricted to students with 0-26 credits (Freshmen) Aerospace Engineering (ASEN) or Engineering Open Option majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 1022 (3) Materials Science for Aerospace Engineers

Covers prerequisite chemistry topics for materials science and introduces material types, properties and behavior for aerospace engineers.

Topics include review of chemistry; atomic bonding; crystals; diffusion; mechanical/thermal properties; phase diagrams; heat treatment; failure mechanisms; materials selection; and a general introduction to modern materials for aerospace engineering applications including composites, nanomaterials and metamaterials. Lab project or tensile testing is included.

Requisites: Requires prerequisite courses of APPM 1350 or MATH 1300 (minimum grade C). Requires corequisite courses of CHEN 1310 or ECEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320. Restricted to Aerospace Engineering (ASEN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 1400 (3) Gateway to Space

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 2500

Requisites: Restricted to College of Engineering students with a maximum of 50 credit hours.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 1969 (3) Pathway to Space

Explore the many paths one can take to be a part of a space-related career in a unique, engaging and interactive course. Students will learn about the following topics: space science and exploration, human spaceflight and life sciences, aeronautics and near space, launch and spacecraft systems, climate and environment, space business, policy and politics, space arts, media, and history.

Requisites: Restricted to Space Minor students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Specialized Courses

ASEN 2001 (4) Aerospace 1: Introduction to Statics, Structures, and Materials

Introduces models and analytical/numerical methods for statics and structural analysis. Topics include force/moment equilibrium, truss analysis, beam theory, stress/strain, failure criteria, and structural design. Matlab proficiency required. Offered fall only.

Requisites: Requires prereqs of PHYS 1110 APPM 1350 or MATH 1300 APPM 1360 or MATH 2300 CSCI 1310 or 1320 CHEN 1310 or CSCI 1300 or ECEN 1310 (all min grade C). Requires coreqs of ASEN 2002 2012 APPM 2350. Restricted to Aerospace Eng (ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 2002 (4) Aerospace 2: Introduction to Thermodynamics and Aerodynamics

Introduces the fundamental principles and concepts of thermodynamics and fluid dynamic systems. Emphasizes the synthesis of basic science (physics), mathematics and experimental methods that form the basis for quantitative and qualitative analyses of general aerospace technology systems. Proficiency in Matlab required. Offered fall only.

Requisites: Requires prereqs of PHYS 1110 APPM 1350 or MATH 1300 APPM 1360 or MATH 2300 CSCI 1310 or 1320 CHEN 1310 or CSCI 1300 or ECEN 1310 (all min grade C). Requires coreqs of ASEN 2001 2012 APPM 2350. Restricted to Aerospace Eng (ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 2003 (5) Aerospace 3: Introduction to Dynamics and Systems

Introduces the principles of particle and planar rigid body dynamics, systems, and controls. Topics include kinematics, kinetics, momentum and energy methods, system modeling, and simple feedback control. Class includes experimental and design laboratory exercises for aerospace applications of dynamic principles. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2001 and ASEN 2012 and APPM 2350 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2004. Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 2004 (5) Aerospace 4: Aerospace Vehicle Design and Performance

Introduction to design and analysis of aircraft and spacecraft. Aircraft topics include cruise performance, wing design, propulsion, stability, control, and structures. Spacecraft topics include rocket staging, orbit selection, launch systems, and spacecraft subsystems. Includes laboratory experiments and team design exercises. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2001 and ASEN 2002 and ASEN 2012 and APPM 2350 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2003. Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 2012 (2) Experimental and Computational Methods in Aerospace Engineering Sciences

Introduces statistical, experimental, and computational methods used in aerospace engineering sciences. Usage of MatLab is extensive. Offered fall only.

Requisites: Requires a prerequisite course of CHEN 1310 or CSCI 1300 or ECEN 1310 or CSCI 1310 or CSCI 1320 (min grade C). Requires corequisite courses of ASEN 2001 and ASEN 2002 and APPM 2350. Restricted to Aerospace Eng (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 2519 (1-6) Special Topics

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the lower-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisites: varies.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Specialized Courses

ASEN 2849 (1-3) Independent Study

Study of special projects agreed upon by student and instructor. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 3036 (3) Introduction to Human Spaceflight

Introduces students to the challenges of human space flight. Historical and current space programs and spacecraft are discussed with emphasis on those systems specific to sustaining human crews. Other topics include space environment with respect to sustaining human life and health, physiological and psychological concerns in a space habitat, astronaut selection and training, anomalies, mission operations motivation, costs rationale for human space exploration, and future program directions. Not accepted as a Professional Area Elective for ASEN majors.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 3046 (3) Introduction to Humans in Aviation

Investigates the history of manned aviation accomplished through a review of the history of flight, the physiological and psychological limitations facing aviators, and investigates the human related causal factors in aviation accidents. The course also looks at the social and economic impacts of aviation in modern society. Not accepted as a Professional Area Elective for ASEN majors.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 3111 (4) Aerodynamics

Develops the fundamental concepts of aerodynamics and provides a working knowledge for their application to the design of aircraft and launch vehicles operating at various speeds and altitudes, as well as the atmospheric forces on satellites. Offered fall only.

Requisites: Requires prerequisite courses of ASEN 2002 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 3112 (4) Structures

Teaches Mechanics of Materials methods of stress and deformation analysis applicable to the design and verification of aircraft and space structures. It offers an introduction to matrix and finite element methods for truss structures, and to mechanical vibrations. Offered fall only.

Requisites: Requires prerequisite courses of ASEN 2001 and ASEN 2003 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 3113 (4) Thermodynamics and Heat Transfer

Focuses on the applications of the first and second laws of thermodynamics to control volumes and teaches the fundamental concepts of different modes of energy and heat transfer. Learn to use these concepts in gas dynamics, high-speed vehicle spacecraft design, environmental systems, and energy analysis. Offered fall only.

Requisites: Requires prerequisite courses of ASEN 2002 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 3116 (3) Introduction to Biomedical Engineering

Addresses human responses to environment and physical stimuli. Makes use of engineering and physical principles in the study of human dynamics, arriving at reasonable solutions to 15 major areas of biomedical consent. Instructor consent required.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 3128 (4) Aircraft Dynamics

Develops the fundamental concepts of aircraft dynamics. Covers flight mechanics, performance, dynamics and control of aircraft and how they impact aircraft design. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2002 and ASEN 2003 and ASEN 2004 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 3200 (4) Orbital Mechanics/Attitude Dynamics and Control

Presents the fundamentals of orbital mechanics, 3D rigid body dynamics and satellite attitude dynamics and controls. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2003 and ASEN 2004 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 3300 (4) Aerospace Electronics and Communications

Provides the fundamentals of electronics and communications widely used in aerospace engineering. Includes analog instrumentation electronics, data acquisition, digital electronics and radio communication. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2003 and PHYS 1120 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 3519 (1-4) Special Topics

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner.

Department enforced prerequisite: varies.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Specialized Courses

ASEN 3930 (6) Aerospace Engineering Cooperative Education

Students will participate in a previously arranged, department-sponsored cooperative education program with a government agency or industry.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Aerospace Engineering (ASEN) majors only.

Recommended: Prerequisite GPA above 3.0.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Specialized Courses

ASEN 4010 (3) Introduction to Space Dynamics

Includes central force fields, satellite orbits, rocket dynamics, orbital transfer, interplanetary mission analysis, and perturbation due to atmospheric drag and Earth oblateness.

Requisites: Requires prerequisite course of ASEN 3200 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 4012 (3) Aerospace Materials

Studies aerospace grade aluminum, magnesium, nickel, and titanium alloys. Covers heat treatment, defect structures, failure mechanisms, corrosion and its prevention, the effect of space radiation on materials, and high and low temperature effects. Introduces composite materials with a lab design and experiment. Emphasizes the selection of materials in design with procedures for choosing materials rationally. Case studies include aerogels, carbides, composites, powder metallurgy, nanomaterials, and advanced materials manufacturing technologies.

Requisites: Requires prerequisite course of ASEN 2001 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 4013 (3) Foundations of Propulsion

Describes aerothermodynamics and design of both rocket and air-breathing engines. Includes ramjets, turbojets, turbofans, and turboprop engines, as well as liquid, solid, and hybrid rockets.

Requisites: Requires prerequisite courses of ASEN 3113 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 4018 (4) Senior Projects 1: Design Synthesis

Focuses on the synthesis of technical knowledge, project management, design process, leadership, and communications within a team environment. Students progress through the design process beginning with requirements development, then preliminary design and culminating with critical design. Offered fall only.

Requisites: Requires prereq courses of ASEN 3111, 3112, 3113, 3128, 3200 and 3300 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engr (ASEN) Aerospace or Engr-Concurrent Degree (C-ASEN) students majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4028 (4) Senior Projects 2: Design Practicum

Focuses on the fabrication, integration, verification and validation of designs produced in ASEN 4018. Students work within the same teams from ASEN 4018. Department consent required. Offered spring only.

Requisites: Requires prerequisite course of ASEN 4018 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4057 (3) Aerospace Software

Provides an overview of prevalent software and hardware computing concepts utilized in practice and industry. Establishes the background necessary to tackle programming projects on different computing platforms with various software tools and programming languages.

Requisites: Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites CSCI 1320 or ECEN 1310 or CHEN 1310.

Additional Information: Departmental Category: Computational and Analytical Methods

ASEN 4090 (3) Global Positioning Systems Applications

Focuses on GPS technology, software development, and applications. Lectures will cover the principal concepts used in GPS, and weekly laboratories will apply that knowledge. Culminates in student design projects using GPS.

Requisites: Requires prerequisite courses of APPM 2360 and CHEN 1310 (all minimum grade C).

Recommended: Prerequisite junior/senior standing in engineering.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 4114 (3) Automatic Control Systems

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5114

Requisites: Requires prerequisite courses of ASEN 3128 and ASEN 3200 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 4123 (3) Vibration Analysis

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4123

Requisites: Requires prerequisite course of ASEN 3112 or MCEN 3030 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 4128 (3) Human Factors in Engineering and Design

Introduces the field of human factors engineering and investigates human psychological, physiological and performance limitations in complex systems and why it is vital for engineers to understand human operational limitations when designing complex systems. Course includes studies of real accidents caused by human error, good and bad designs, latent conditions and accident-producing designs. Goal is an understanding of how to conduct engineering design with consideration of human factors.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4138 (3) Aircraft Design

Two lectures and one lab per week. Examines principles of aircraft configuration and design to meet given performance specifications, taking into account aerodynamic, stability and control, and flying quality considerations, as well as airworthiness regulations. Includes preliminary design of the major elements of an aircraft.

Requisites: Requires prerequisite course of ASEN 3128 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5215 and ATOC 4215 and ATOC 5215

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 4216 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5216 and ECEN 4811

Requisites: Requires prerequisite course of ASEN 3300 or ECEN 2260 or ECEN 3030 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 4218 (3) Large Space Structures Design

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5218

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engineering (ASEN) or Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4222 (3) Materials Science for Composite Manufacturing

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5222

Requisites: Requires prerequisite course of ASEN 3112 and prerequisite or corequisite course of ASEN 4012 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 4238 (3) Computer-Aided Control Systems Design

Covers Matlab and Simulink software, and multivariable control system synthesis and analysis techniques for typical aerospace control problems. Students formulate control problems and synthesize control functions using lineage quadratic techniques. Includes numerical integration of differential equations and nonlinear simulation of orbit and attitude dynamics.

Requisites: Requires prerequisite course of APPM 2360 (minimum grade C).

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4248 (3) Computer-Aided Control System Design 2

Studies theory and engineering applications of Kalman filter techniques. Covers discrete and continuous filters, the extended Kalman filter, and their application to guidance, navigation, and control, including satellite orbit and attitude problems, inertial and control navigation, and the Global Positioning System.

Requisites: Requires prerequisite course of ASEN 4238 (minimum grade C).

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4255 (3) Environmental Aerodynamics

A review of the properties and causes of hazards posed by the environment, ranging from atmospheric wind shear to tornadic flows. Involves a multidisciplinary approach combining analytical, numerical, scale modeling studies with extensive field measurements, wind energy and biophysical aerodynamics.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5255

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 4338 (3) Computer Analysis of Structures

Covers basic structural design concepts and finite element modeling techniques. Emphasizes use of finite element static and dynamic analysis to validate and refine an initial design. Introduces basic design optimization and tailoring. Proficiency in Matlab required.

Requisites: Requires prerequisite course of ASEN 3112 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 4426 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5426 and ECEN 4821 and ECEN 5821

Requisites: Requires prerequisite course of ASEN 3300 or ECEN 2260 or ECEN 3030 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 4519 (1-3) Special Topics

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner.

Department enforced prerequisite varies.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Specialized Courses

ASEN 4849 (1-6) Independent Study

Special projects agreed upon by student and instructor. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 4859 (1-6) Undergraduate Research

Assigns a research problem on an individual basis. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

Aerospace Engineering Science - Bachelor of Science (BS)

The undergraduate curriculum in Aerospace Engineering Sciences (<http://www.colorado.edu/aerospace/prospective-students/undergraduates>) is designed to prepare students to advance to a distinguished professional career in the aerospace industry or for graduate school, consistent with our stated Program Educational Objectives. In particular, this involves providing students with an interdisciplinary systems perspective of aerospace engineering. The curriculum accomplishes these goals by:

- providing a strong basis in mathematics, science, and engineering fundamentals;
- extending these fundamentals to advanced topics in aerospace engineering;
- complementing the engineering education with sufficient exposure to the humanities and social sciences; and
- beginning and ending in major design experiences that stress an interdisciplinary systems perspective.

AES students are also encouraged to consider a technical minor or double major in electrical engineering, computer science, applied math, engineering physics, astrophysical and planetary sciences, or atmospheric and oceanic sciences. In most cases, the junior- and senior-level courses required for the above-mentioned minors can be applied to the professional area elective requirements.

For students having sufficient ability and interest, planning for graduate study should begin by the start of the junior year. Such a plan should consider the foreign language requirements of appropriate graduate schools and an advanced mathematics program. Students who wish to combine the business and aerospace engineering sciences curricula are advised to consider obtaining the BS degree in aerospace and a master's degree in business rather than a combined BS degree.

Bioengineering Option/Premedical Curriculum

Courses can be specifically designed for students who wish either to attend medical school or to enter graduate work in bioengineering after receiving the BS degree. Students should consult their academic advisor, as well as their prehealth advisor, regularly to assure the adequacy of their curricula.

Concurrent Degree Program BS/MS in Aerospace Engineering Sciences

The Concurrent BS/MS Program (<http://www.colorado.edu/aerospace/current-students/undergraduates/bsms-degree>) in Aerospace Engineering Sciences enables the program's top BS students to be admitted to the MS program during the junior or senior year, and to work thereafter toward both the BS and MS degrees in aerospace engineering sciences. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of the BS degree requirements, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit hour load. Up to 6 credit hours may be counted towards both the BS and MS degree programs. Therefore, in theory, the minimum number of credit hours required for the concurrent BS/MS degrees will be 152. Current University of Colorado Boulder aerospace students are eligible to apply after they have completed eight core ASEN courses and have a minimum CU Boulder cumulative and ASEN major GPA of 3.250.

Requirements

Prerequisites and Passing Grades

The minimum passing grade for a course that is a prerequisite for another required course is C. If a grade of C- or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C or higher.

The minimum passing grade for a course that is not specifically a prerequisite for another required course is D-.

The Aerospace Engineering Sciences (AES) department reserves the right to drop students enrolled in ASEN courses who have not met the minimum prerequisite grade requirements. It is the student's responsibility to communicate with the department if summer course work and/or transfer credit will be used to meet the prerequisite requirement.

Aerospace engineering students are expected to take Applied Math (APPM) courses for the required mathematics courses (APPM 1350, APPM 1360, APPM 2350, APPM 2360) once they have matriculated into the program.

Course Requirements

The BS curriculum in aerospace engineering sciences is revised annually to keep up with new advances in technology, to make use of new educational methodologies, and to satisfy updated program accreditation criteria. A total of 128 credit hours is required.

Students who are unsure of their major selection are advised to take Chemistry for Engineers & Lab (CHEN 1211/CHEM 1221) in the fall of the freshman year in case the student decides to change their major. The 5 credit hours earned for this course may then apply as free electives for ASEN majors who take the class.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Freshman		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
First-Year Projects course		3
Humanities or social science elective ¹		3
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
		Credit Hours
		14
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
ASEN 1022	Materials Science for Aerospace Engineers	3
PHYS 1110	General Physics 1	4
Humanities or social science elective ¹		6
		Credit Hours
		17
Sophomore		
Fall Semester		
APPM 2350	Calculus 3 for Engineers	4
ASEN 2001	Aerospace 1: Introduction to Statics, Structures, and Materials	4
ASEN 2002	Aerospace 2: Introduction to Thermodynamics and Aerodynamics	4
ASEN 2012	Experimental and Computational Methods in Aerospace Engineering Sciences	2
Free elective		3
		Credit Hours
		17
Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4

ASEN 2003	Aerospace 3: Introduction to Dynamics and Systems	5
ASEN 2004	Aerospace 4: Aerospace Vehicle Design and Performance	5
Humanities or social science elective ¹		3
	Credit	17
	Hours	
Junior		
Fall Semester		
ASEN 3111	Aerodynamix	4
ASEN 3112	Structures	4
ASEN 3113	Thermodyna and Heat Transfer	4
PHYS 1120	General Physics 2	4
	Credit	16
	Hours	
Spring Semester		
ASEN 3128	Aircraft Dynamics	4
ASEN 3200	Orbital Mechanics/ Attitude Dynamics and Control	4
ASEN 3300	Aerospace Electronics and Communications	4
Professional area elective		3
	Credit	15
	Hours	
Senior		
Fall Semester		
ASEN 4013	Foundations of Propulsion	3
ASEN 4018	Senior Projects 1: Design Synthesis	4
College-approved writing course ²		3
Professional area electives		6
	Credit	16
	Hours	
Spring Semester		
ASEN 4028	Senior Projects 2: Design Practicum	4
Professional area electives		6
Humanities or social science elective ¹		3
Free elective		3
	Credit	16
	Hours	
	Total Credit	128
	Hours	

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Professional Area Electives

- Any ASEN course at the 4000 level or above that is not a required course can be used as a professional area elective.
- A professional area elective (PAE) is generally a course in math, engineering, or science at the 3000-level or above. Elective courses most likely to help an aerospace engineer's career development are ASEN, APPM, CSCI, ECEN, and PHYS courses. It is suggested that students secure advance approval for professional area elective courses from their advisor.
- Upper-division independent study from technical areas (math, science, and engineering) is acceptable for up to 6 credit hours of professional area elective credit. The upper-division ROTC courses AIRR 3010, NAVR 3030 and NAVR 3040 are acceptable for 3 credit hours of professional area elective credit.

A full listing of approved PAE courses can be found in the degree audit.

Applied Mathematics

Applied mathematics graduates have the expertise and mathematical sophistication necessary to make contributions in a wide variety of fields, including scientific computation, actuarial science, financial modeling, and most areas of science and engineering that have a mathematical basis.

A professional applied mathematician may work with engineers, scientists, programmers, and other specialists. The curriculum at CU Boulder is designed to have the breadth for such an interdisciplinary career.

Course offerings at the undergraduate level focus on providing students with mathematical tools, problem-solving strategies, and expertise useful in science and engineering. To fulfill requirements, a concentrated area of engineering courses (or approved natural science courses) must be completed. The college has formulated several recommended options within the discipline.

The Department of Applied Mathematics (<http://www.colorado.edu/amath>) in the College of Engineering & Applied Science offers a BS degree in applied mathematics. The BS degree is designed to prepare graduates for exciting and diverse professional careers, and for graduate study in a wide variety of disciplines. A minor in Applied Mathematics (p. 153) and a minor in Statistics (p. 159) are offered through the College of Arts & Sciences.

The objectives of the Department of Applied Mathematics at CU Boulder are summarized below:

- provide undergraduate and graduate students with high-quality education and training in applied mathematics, and prepare them for careers in industry, laboratories, and the academic professions;
- offer and monitor degree programs leading to BS, MS, and PhD degrees in applied mathematics;

- nourish and maintain a professional environment in which excellence in teaching, learning, scholarship, and creativity are of central importance;
- assure teaching and research expertise in a number of key areas of applied mathematics including the methodology of applied mathematics, computational mathematics and algorithms, industrial applications, mathematical biology, applied probability, and statistics.

Courses at the undergraduate level provide training in a broad range of mathematical techniques and problem-solving strategies. These courses teach the concepts and methods central to applications of linear algebra, ordinary and partial differential equations, numerical analysis, probability and statistics, complex variables, and nonlinear dynamics. Since applied mathematicians often are involved in interdisciplinary work, the BS degree requires an in-depth knowledge of some area of science or engineering where mathematics is used. This knowledge prepares graduates to successfully communicate and cooperate with engineers and scientists. The BS degree also requires knowledge of a programming language and skill in using the computer.

Course code for this program is **APPM**.

Desired Outcomes

The undergraduate degree in applied mathematics emphasizes knowledge and awareness of:

- differential and integral calculus in one and several variables;
- vector spaces and matrix algebra;
- ordinary and partial differential equations;
- at least one programming language;
- at least one application software package in either mathematics or statistics;
- methods of complex variables as used in applications; and
- numerical solutions of linear and nonlinear problems.

In addition, students completing a degree in applied mathematics acquire:

- an in-depth knowledge of an area of application (an engineering discipline or a natural science field or one of the quantitative areas of business and economics);
- knowledge of problem-formulation, problem-solving and modeling techniques, and strategies central to applications; and
- the ability to communicate analytic arguments clearly and concisely in oral and written forms.

Bachelor's Degrees

- Applied Mathematics - Bachelor of Science (BS) (p. 637)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ablowitz, Mark J (https://experts.colorado.edu/display/fisid_100691)
Professor; PhD, Massachusetts Institute of Technology

Bebernes, Jerrold
Professor Emeritus

Becker, Stephen R (https://experts.colorado.edu/display/fisid_154263)
Assistant Professor; PhD, California Institute of Technology

Beylkin, Gregory (https://experts.colorado.edu/display/fisid_100437)
Professor; PhD, New York University

Bhat, Yermal Sujeet (https://experts.colorado.edu/display/fisid_146506)
Instructor; PhD, University of Florida

Bortz, David Matthew (https://experts.colorado.edu/display/fisid_143348)
Associate Professor; PhD, North Carolina State University at Raleigh

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Corcoran, Jem (https://experts.colorado.edu/display/fisid_118142)
Associate Professor; PhD, Colorado State University

Cox, Murray William (https://experts.colorado.edu/display/fisid_153192)
Instructor; PhD, Texas AM University

Curry, James H (https://experts.colorado.edu/display/fisid_105730)
Professor; PhD, University of California-Berkeley

Dougherty, Anne Margaret (https://experts.colorado.edu/display/fisid_101349)
Senior Instructor; PhD, University of Wisconsin-Madison

Dukic, Vanja (https://experts.colorado.edu/display/fisid_148718)
Professor; PhD, Brown University

Easton, Robert
Professor Emeritus

Fornberg, Bengt (https://experts.colorado.edu/display/fisid_108048)
Professor; PhD, Univ of Uppsala (Sweden)

Grooms, Ian G (https://experts.colorado.edu/display/fisid_155588)
Assistant Professor; PhD, University of Colorado Boulder

Hoefer, Mark (https://experts.colorado.edu/display/fisid_154264)
Associate Professor; PhD, University of Colorado Boulder

Julien, Keith (https://experts.colorado.edu/display/fisid_108913)
Professor; PhD, University of Cambridge (England)

Kilpatrick, Zachary Peter (https://experts.colorado.edu/display/fisid_155782)
Assistant Professor; PhD, University of Utah

Kleiber, William Paul (https://experts.colorado.edu/display/fisid_151943)
Assistant Professor; PhD, University of Washington

Li, Congming (https://experts.colorado.edu/display/fisid_100647)
Professor; PhD, New York University

Lladser, Manuel Bosco (https://experts.colorado.edu/display/fisid_134170)
Associate Professor; PhD, Ohio State University

Manteuffel, Thomas A (https://experts.colorado.edu/display/fisid_102137)
Professor; PhD, University of Illinois at Urbana-Champaign

Martinsson, Per-Gunnar J (https://experts.colorado.edu/display/fisid_141180)

Professor; PhD, University of Texas at Austin

McCormick, Steven

Professor Emeritus

Meiss, James D (https://experts.colorado.edu/display/fisid_103702)

Professor; PhD, University of California-Berkeley

Meyer, Francois Georges (https://experts.colorado.edu/display/fisid_115559)

Professor; PhD, INRIA (France)

Norris, Jan Adam (https://experts.colorado.edu/display/fisid_101412)

Senior Instructor; PhD, University of Colorado Boulder

Restrepo, Juan G (https://experts.colorado.edu/display/fisid_145811)

Associate Professor; PhD, University of Maryland College Park Campus

Segur, Harvey (https://experts.colorado.edu/display/fisid_102287)

Professor; PhD, University of California-Berkeley

Zaharatos, Brian R (https://experts.colorado.edu/display/fisid_156225)

Instructor; MS, Colorado School of Mines

APPM 1235 (4) Pre-Calculus for Engineers

Prepares students for the challenging content and pace of the calculus sequence required for all engineering majors. Covers algebra, trigonometry and selected topics in analytical geometry. Prepares students for the calculus courses offered for engineering students. Requires students to engage in rigorous work sessions as they review topics that they must be comfortable with to pursue engineering course work. Structured to accustom students to the pace and culture of learning encountered in engineering math courses. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor. Formerly GEEN 1235.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1021 or MATH 1150

Requisites: Restricted to College of Engineering or Pre-Engineering Arts and Sciences majors only. Requires or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

APPM 1340 (4) Calculus 1 with Algebra, Part A

Studies selected topics in analytical geometry and calculus: rates of change of functions, limits, derivatives and their applications. This course and APPM 1345 together are equivalent to APPM 1350. The sequence of this course and APPM 1345 is specifically designed for students whose manipulative skills in the techniques of high school algebra and precalculus may be inadequate for APPM 1350. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

APPM 1345 (4) Calculus 1 with Algebra, Part B

Continuation of APPM 1340. Studies selected topics in calculus: derivatives and their applications, integration, differentiation and integration of transcendental functions. Algebraic and trigonometric topics are studied throughout, as needed.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330
Requisites: Requires prerequisite course of APPM 1340 (minimum grade C-).

APPM 1350 (4) Calculus 1 for Engineers

Topics in analytical geometry and calculus including limits, rates of change of functions, derivatives and integrals of algebraic and transcendental functions, applications of differentiations and integration. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330
Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr: Quant Reasn Mathmat Skills

APPM 1360 (4) Calculus 2 for Engineers

Continuation of APPM 1350. Focuses on applications of the definite integral, methods of integration, improper integrals, Taylor's theorem, and infinite series.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2300
Requisites: Requires prerequisite course of APPM 1345 or APPM 1350 or MATH 1300 (minimum grade C-).

APPM 2350 (4) Calculus 3 for Engineers

Covers multivariable calculus, vector analysis, and theorems of Gauss, Green, and Stokes.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2400
Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 2360 (4) Introduction to Differential Equations with Linear Algebra

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, and systems of linear differential equations.

Equivalent - Duplicate Degree Credit Not Granted: both MATH 2130 and MATH 3430
Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 2450 (1) Calculus 3 Computer Lab

Selected topics in analytic geometry and calculus with a focus on symbolic computation using Mathematica.

Requisites: Requires a corequisite course of APPM 2350.
Grading Basis: Pass/Fail

APPM 2460 (1) Differential Equations Computer Lab

Selected topics in differential equations and linear algebra with a focus on symbolic computation using MATLAB.

Requisites: Requires enrollment in a corequisite course of APPM 2360.
Grading Basis: Pass/Fail

APPM 2720 (1-3) Open Topics in Lower Division Applied Mathematics

Provides a vehicle for the development and presentation of new topics that are accessible to lower division Applied Mathematics students. These topics have the potential to be incorporated into the core APPM curriculum.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

Grading Basis: Letter Grade

APPM 2750 (4) Java: Training, Mathematical Algorithms, and Mobile Apps

Preparatory course for Java programming. Provides necessary background for Java language: basic object-oriented concepts, analysis, and design. Learn to create Java applets, applications and mobile apps, create graphic context, and identify the key features of Java foundation classes as well as other Java-related technology. Material is taught in the context of mathematical algorithms from calculus. Department enforced requisite, knowledge of a programming language.

Requisites: Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

APPM 3010 (3) Chaos in Dynamical Systems

Introduces undergraduate students to chaotic dynamical systems. Topics include smooth and discrete dynamical systems, bifurcation theory, chaotic attractors, fractals, Lyapunov exponents, synchronization and networks of dynamical systems. Applications to engineering, biology and physics will be discussed.

Requisites: Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

APPM 3050 (3) Scientific Computing in Matlab

Topics covered include: approximations in computing, computer arithmetic, interpolation, matrix computations, nonlinear equations, optimization, and initial-value problems with emphasis on the computational cost, efficiency, and accuracy of algorithms. The problem sets are application-oriented with examples taken from orbital mechanics, physics, genetics, and fluid dynamics.

Requisites: Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

APPM 3170 (3) Discrete Applied Mathematics

Introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering. Mathematical definitions and proofs are emphasized. Topics include formal logic notation, proof methods; set theory, relations; induction, well-ordering; algorithms, growth of functions and complexity; integer congruencies; basic and advanced counting techniques, recurrences and elementary graph theory. Other selected topics may also be covered.

Requisites: Requires a prerequisite or corequisite course of APPM 2350 or APPM 2360 or MATH 2400 (prereq minimum grade C-).

APPM 3310 (3) Matrix Methods and Applications

Introduces linear algebra and matrices with an emphasis on applications, including methods to solve systems of linear algebraic and linear ordinary differential equations. Discusses vector space concepts, decomposition theorems, and eigenvalue problems.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2130 and MATH 2135

Requisites: Requires prerequisite course of APPM 2350 or APPM 2360 or MATH 2400 (minimum grade C-).

APPM 3350 (3) Advanced Engineering Calculus

Extends the treatment of engineering mathematics beyond the topics covered in Calculus 3 and differential equations. Topics include non-dimensionalization, elementary asymptotics and perturbation theory, Reynold's transport theorem and extensions of Leibnitz's rule, as applied to continuum conservation equations, Hamiltonian formulations, Legendre and Laplace transforms, special functions and their orthogonality properties.

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

APPM 3570 (3) Applied Probability

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3810 or MATH 4510

Requisites: Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

APPM 4120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5120 and MATH 4120 and MATH 5120

Requisites: Requires a prerequisite course of APPM 3310 or MATH 2130 or MATH 2135 (minimum grade C-).

APPM 4350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems

Reviews ordinary differential equations, including solutions by Fourier series. Physical derivation of the classical linear partial differential equations (heat, wave, and Laplace equations). Solution of these equations via separation of variables, with Fourier series, Fourier integrals, and more general eigenfunction expansions.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5350

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4360 (3) Methods in Applied Mathematics: Complex Variables and Applications

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5360

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4380 (3) Modeling in Applied Mathematics

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5380

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

Recommended: Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

APPM 4390 (3) Modeling in Mathematical Biology

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5390

Requisites: Requires prerequisite courses of APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 (all minimum grade C-).

APPM 4440 (3) Undergraduate Applied Analysis 1

Provides a rigorous treatment of topics covered in Calculus 1 and 2. Topics include convergent sequences; continuous functions; differentiable functions; Darboux sums, Riemann sums, and integration; Taylor and power series and sequences of functions.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4450 (3) Undergraduate Applied Analysis 2

Continuation of APPM 4440. Study of multidimensional analysis including n-dimensional Euclidean space, continuity and uniform continuity of functions of several variables, differentiation, linear and nonlinear approximation, inverse function and implicit function theorems, and a short introduction to metric spaces.

Requisites: Requires prerequisite course of APPM 4440 or MATH 3001 (minimum grade C-).

APPM 4500 (3) Statistical Collaboration

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5500

Requisites: Requires a prerequisite course of APPM 4520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4505 (2) Advanced Statistical Collaboration

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5505

Requisites: Requires prerequisite course of APPM 4500 or APPM 5500 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4510 (3) Data Assimilation in High Dimensional Dynamical Systems

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5510

Requisites: Requires prerequisite courses of APPM 3310 and APPM 3570 (all minimum grade C-).

Grading Basis: Letter Grade

APPM 4520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5520 and MATH 4520 and MATH 5520

Requisites: Requires prerequisite course of APPM 3570 or MATH 4510 (minimum grade C-).

APPM 4530 (3) Stochastic Analysis for Finance

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5530

Requisites: Requires prerequisite courses of APPM 3570 and APPM 3310 (all minimum grade C-). Requires prerequisite or corequisite course of APPM 4350 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5540 and MATH 4540 and MATH 5540

Requisites: Requires prerequisite course of APPM 4520 or MATH 4520 (minimum grade C-).

APPM 4550 (3) Spatial Statistics

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5550

Requisites: Requires prerequisite course of APPM 4520 or APPM 5520 or MATH 4520 or MATH 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4560 (3) Markov Processes, Queues, and Monte Carlo Simulations

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5560

Requisites: Requires prerequisite course of APPM 3570 or MATH 4510 (minimum grade C-).

APPM 4570 (3) Statistical Methods

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5570

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 4580 (3) Introduction to Statistical Learning

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5580

Requisites: Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-).

APPM 4590 (3) Statistical Modeling

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5590

Requisites: Requires prerequisite course of APPM 4520 or APPM 4570 or MATH 4520 (minimum grade C-).

APPM 4650 (3) Intermediate Numerical Analysis 1

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced prerequisite: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4650

Requisites: Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

APPM 4660 (3) Intermediate Numerical Analysis 2

Continuation of APPM 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations. Department enforced prerequisite: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4660

Requisites: Requires prerequisite course of APPM 4650 or MATH 4650 (minimum grade C-).

APPM 4720 (1-3) Open Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5720

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APPM 4840 (1-3) Reading and Research in Applied Mathematics

Introduces undergraduate students to the research foci of the Department of Applied Mathematics. Department enforced prerequisite: variable depending on the topic.

Repeatable: Repeatable for up to 9.00 total credit hours.

APPM 4950 (1-3) Seminar in Applied Mathematics

Introduces undergraduate students to the research foci of the program in applied mathematics. It is also designed to be a capstone experience for the program's majors. Department enforced prerequisite: variable depending on the topic.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Applied Mathematics - Bachelor of Science (BS)

The Department of Applied Mathematics in the College of Arts and Sciences offers a BS Degree in Applied Mathematics (<http://www.colorado.edu/amath/prospective-students/undergraduate>) through the College of Engineering and Applied Science. The BS degree is designed to prepare graduates for exciting and diverse professional careers, and for graduate study in a wide variety of disciplines.

Courses at the undergraduate level provide training in a broad range of mathematical techniques and problem-solving strategies. These courses teach the concepts and methods central to applications of linear algebra, ordinary and partial differential equations, numerical analysis, probability and statistics, complex variables, and nonlinear dynamics. Since applied mathematicians often are involved in interdisciplinary work, the BS degree requires an in-depth knowledge of some area of science or engineering where mathematics is used. This knowledge prepares graduates to successfully communicate and cooperate with engineers and scientists. The BS degree also requires knowledge of a programming language and skill in using the computer.

Research Opportunities

The Department of Applied Math offers a broad range of undergraduate research opportunities funded by National Science Foundation grants, and students can gain professional exposure through the student chapter of the Society of Industrial and Applied Mathematics (SIAM) on campus.

Working with faculty, applied math students have developed solutions to a variety of problems in fluids, dynamical systems, data analysis, networks, signal processing, math biology, math education, and numerics. Applied math students also worked with faculty to develop the Mathematical Visualization Toolkit, an award-winning online instructional tool that helps students better visualize calculus concepts.

Concurrent Degree Programs

BS/MS in Applied Mathematics (<http://www.colorado.edu/amath/academics/bs-ms-program>)

The concurrent BS/MS program in applied mathematics enables well-qualified and motivated students to experience graduate-level course work earlier in their education and to obtain an MS degree in a reduced time period. Applied math majors may apply for this program during their junior year. Minimum requirements for admission include completion of at least two APPM courses numbered 3000 or higher, an overall GPA of 3.400 or higher, a minimum GPA of 3.400 in APPM and MATH courses and two letters of recommendation from APPM faculty. Students interested in this program are encouraged to consult with an applied mathematics faculty advisor early in their undergraduate career.

BS in Applied Mathematics and MS in Interdisciplinary Telecommunications Program (ITP)

Communications and networking systems play an increasingly central role in our individual lives and society. Social networks, internet-based commerce, wireless networks, and remote access to education and medical care all depend on the reliable, secure and efficient use of network hardware consisting of mobile devices, switches, routers, data centers, and cellular base stations. This concurrent program enables well-qualified students to be admitted to the ITP MS program during the junior year of their BS program, and to work thereafter towards earning both the BS and MS degrees. This concurrent degree program is aimed at the specific needs of companies requiring engineers with an integrated knowledge of mathematical techniques to develop and implement secure networks and data centers that are interconnected by state of the art broadband links. For more information, please contact an ITP or APPM advisor.

Dual Degree Program

BS in Applied Mathematics and Civil Engineering

As an exceptional opportunity for talented students who are interested in analytical and computational methods related to civil engineering and general engineering science, the applied mathematics and civil engineering departments offer a streamlined track by which a student can earn a baccalaureate degree from both programs with a minimum of 15 extra credit hours. Consult faculty advisors in applied mathematics and civil engineering for information and admission.

Requirements

The BS Degree in Applied Mathematics requires the satisfactory completion of a minimum of 128 credit hours as follows.

Required Courses and Semester Credit Hours

Calculus

APPM 1350	Calculus 1 for Engineers ¹	4
APPM 1360	Calculus 2 for Engineers ¹	4
APPM 2350	Calculus 3 for Engineers ¹	4

Computing Experience

Select one of the following:		3-4
CSCI 1300	Computer Science 1: Starting Computing	4
CSCI 1310	Computer Science 1: Starting Computing - Experienced	4
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
CHEN 1310	Introduction to Engineering Computing	3
ECEN 1310	C Programming for ECE	4

Science Requirement

PHYS 1110	General Physics 1	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Select at least 5 additional credit hours of chemistry or biology (including 2 credit hours of laboratory science) from one of the following:		5-8
CHEN 1211 & CHEM 1221	General Chemistry for Engineers and Engineering General Chemistry Lab	5
CHEM 1113 & CHEM 1114	General Chemistry 1 and Laboratory in General Chemistry 1	5

EBIO 1210 & EBIO 1220 & EBIO 1230 & EBIO 1240	General Biology 1 and General Biology 2 and General Biology Laboratory 1 and General Biology Laboratory 2	8
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MCDB 1150 & MCDB 1151 & MCDB 2150 & MCDB 2151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab and Principles of Genetics and Principles of Genetics Laboratory	8
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APPM Courses

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
APPM 3310	Matrix Methods and Applications	3
APPM 4350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	3
APPM 4360	Methods in Applied Mathematics: Complex Variables and Applications	3
APPM 4650	Intermediate Numerical Analysis 1	3
Select one of the following:		3
APPM 4440	Undergraduate Applied Analysis 1	3
MATH 3001	Analysis 1	3
MATH 3140	Abstract Algebra 1	3

APPM or MATH Courses Numbered 4000 or Above

A two-semester course sequence of applied mathematics or mathematics courses numbered 4000 or above in addition to APPM 4350 and APPM 4360, for example:

APPM 4380 & APPM 4390	Modeling in Applied Mathematics and Modeling in Mathematical Biology	6
APPM 4440 & APPM 4450	Undergraduate Applied Analysis 1 and Undergraduate Applied Analysis 2	6
APPM 4570 & APPM 4580	Statistical Methods and Introduction to Statistical Learning	6
APPM 4560 & APPM 4520	Markov Processes, Queues, and Monte Carlo Simulations and Introduction to Mathematical Statistics	6
APPM 4650 & APPM 4660	Intermediate Numerical Analysis 1 and Intermediate Numerical Analysis 2	6
APPM 3570 & APPM 4520	Applied Probability and Introduction to Mathematical Statistics ²	6
APPM 3570 & APPM 4560	Applied Probability and Markov Processes, Queues, and Monte Carlo Simulations ²	6

APPM or MATH Courses Numbered 3000 or Above

A minimum of 24 credit hours in applied mathematics or mathematics courses numbered 3000 or above (including the required courses) ³

Engineering Courses

A minimum of 24 credit hours in engineering (see "Recommended Options For Applied Math Majors" below)

General Bachelor's Degree Requirements

15 credit hours of humanities & social sciences electives ⁴	15
3 credit hours of writing ⁵	3

Total Credit Hours 216-220

¹ With a minimum grade of C-.

² APPM 3570 is the only 3000-level course that can be used to satisfy this requirement.

³ No more than 3 credit hours of APPM 4840 may count toward these 24. No more than 6 credit hours of independent study are allowed for credit toward the BS degree in applied mathematics.

⁴ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

⁵ Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Recommended Options for Applied Math Majors

In order to fulfill their degree requirements, applied mathematics majors are required to take 24 credit hours in engineering or approved courses with significant mathematical content in A&S or Business courses, with at least 6 credit hours in courses numbered 3000 or above and at least 15 credit hours in courses numbered 2000 or above. Here are several possible options. It should be stressed that the listed courses and options are **suggestions** and not **requirements**. Final course selection should be made in consultation with an applied math advisor.

These 24 credit hours are in addition to those required credit hours listed in "Computing Experience" and "Science Requirement" (mentioned above). HUEN 3100, HUEN 3200, and HUEN 4200 may not be used to fulfill this requirement, although they may be used as humanities and social sciences electives. Several possible options are listed separately.

I. Aerospace Engineering Sciences

ASEN 2001	Aerospace 1: Introduction to Statics, Structures, and Materials	4
ASEN 2002	Aerospace 2: Introduction to Thermodynamics and Aerodynamics	4
ASEN 2003	Aerospace 3: Introduction to Dynamics and Systems	5
ASEN 2004	Aerospace 4: Aerospace Vehicle Design and Performance	5
ASEN 2012	Experimental and Computational Methods in Aerospace Engineering Sciences	2
Take at least 6 credit hours of ASEN courses at the 3000-level or above		6
Total Credit Hours		26

Advising Note: Students wishing to enroll in ASEN courses must register through an Aerospace advisor. Students who pursue this option are typically double majors.

II. Chemical Engineering Option

CHEN 1211 & CHEM 1221	General Chemistry for Engineers and Engineering General Chemistry Lab	5
Recommended courses (to bring to a total of 25 credit hours):		20
CHEN 2120	Chemical Engineering Material and Energy Balances	3
CHEN 3200	Chemical Engineering Fluid Mechanics	3
CHEN 3210	Chemical Engineering Heat Transfer	3
CHEN 3220	Chemical Engineering Separations and Mass Transfer	3
CHEN 3320	Chemical Engineering Thermodynamics	3
CHEN 4521	Physical Chemistry for Engineers	3
CHEN 4330	Chemical Engineering Reaction Kinetics	3

CHEM 3311	Organic Chemistry 1	4
Total Credit Hours		50

Students choosing this option must take CHEN 1310 as part of their applied math major. CHEN 1310 is a prerequisite for CHEN 2120.

III. Computer Science Option

Required Course

CSCI 2270	Computer Science 2: Data Structures ¹	4
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Additional Courses

Additional courses to bring the total number of credit hours to 24; at least two of these must be at the 3000 level. Possible choices include:

CSCI 2400	Computer Systems	4
CSCI 3104	Algorithms ²	4
CSCI 3155	Principles of Programming Languages	4
CSCI 3287	Design and Analysis of Data Systems	3
CSCI 3308	Software Development Methods and Tools	3
CSCI 3753	Design and Analysis of Operating Systems	4

Additional CSCI courses to bring the total number of credit hours to at least 24

Total Credit Hours		46
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¹ CSCI 2270 has CSCI 1300 as a prerequisite

² CSCI 3104 has APPM 3170 or CSCI 2824 as a prerequisite.

Advising note: Students completing the computer science option should have a minor in computer science. Check with the Computer Science Department.

IV. Technology, Arts & Media Option

Required Courses

ATLS 2000	The Meaning of Information Technology ¹	3
ATLS 2100	Image	3
ATLS 2200	Web	3
ATLS 2300	Text	3
ATLS 3000	Code	3
CSCI 2270	Computer Science 2: Data Structures ²	4
CSCI 3104	Algorithms ³	4
CSCI 4229	Computer Graphics	3

Additional Courses

Recommended additional courses to bring the total to at least 24 credit hours:

Advisor approved technical electives to complete the ATLAS/TAM Certificate in Digital Media		
CSCI 3202	Introduction to Artificial Intelligence	3
CSCI 4448	Object-Oriented Analysis and Design	3

Total Credit Hours		36
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¹ This course may be used to satisfy EITHER 3 credit hours of H&SS requirement or the applied math area of emphasis, but not both.

² CSCI 1300 is a prerequisite for CSCI 2270

³ APPM 3170 or CSCI 2824 or ECEN 2703, or MATH 2001 are prerequisites for CSCI 3104

Students are advised to take APPM 3570, APPM 4560, and APPM 4660 as part of their applied math course work.

Advising Note: Students interested in the ATLAS/TAM Certificate (<http://tam.colorado.edu>) in Digital Media and the ATLS Minor in Technology, Arts & Media should contact the ATLAS program.

V. Electrical & Computer Engineering Option

The Department of Electrical and Computer Engineering offers two separate minor programs.

1. Students interested in this option should consult with an advisor as several areas are available (computer engineering, electrical engineering, signals and systems, and electrical renewable energy systems.) A minimum of 24 credit hours is required.
2. Student choosing this option should plan on taking CSCI 1300 and CSCI 2270.

Advising Note: Students interested in the ECE option should contact the Electrical, Computer, and Energy Engineering (<http://www.colorado.edu/engineering/academics/degree-programs/electrical-computer-engineering>) department.

VI. Engineering Physics / Physics Option

Recommended courses after first-year Physics:	23-24
PHYS 2130 General Physics 3	3
or PHYS 2170 Foundations of Modern Physics	
PHYS 2150 Experimental Physics 2	1
PHYS 2210 Classical Mechanics and Mathematical Methods 1	3
PHYS 3210 Classical Mechanics and Mathematical Methods 2	3
PHYS 3220 Quantum Mechanics 1	3
PHYS 3310 Principles of Electricity and Magnetism 1	3
PHYS 3320 Principles of Electricity and Magnetism 2	3
PHYS 3330 Electronics for the Physical Sciences	2
or PHYS 4230 Thermodynamics and Statistical Mechanics	
Additional physics courses to total at least 24 credit hours	0-1
Total Credit Hours	44-46

Students choosing this option are advised to take APPM 3570. MATH 3140 may also be useful for students interested in theoretical physics.

Advising Note: Students completing the Physics Option should have a minor in physics. Check with the Physics Department.

VII. Mechanical Engineering Option

Recommended courses:	
MCEN 2023 Statics and Structures	3
MCEN 2043 Dynamics	3
MCEN 2063 Mechanics of Solids	3
MCEN 3012 Thermodynamics	3
MCEN 3021 Fluid Mechanics	3
MCEN 3022 Heat Transfer	3
MCEN 3025 Component Design	3
MCEN 4043 System Dynamics	3
Total Credit Hours	24

Students choosing this option are advised to take APPM 4570, or APPM 3570 and APPM 4520 as part of their applied math major.

Students wishing to enroll in MCEN courses must do so through the MCEN advisor.

VIII. Civil, Environmental and Architectural Engineering Option

Recommended basic courses:	12
CVEN 2121 Analytical Mechanics 1	3
AREN 2110 Thermodynamics	3
CVEN 3161 Mechanics of Materials 1	3
CVEN 3313 Theoretical Fluid Mechanics	3
Select 2 courses from any one of the following groups plus additional courses to bring the total credit hours to 24:	12

Group A

CVEN 3414 Fundamentals of Environmental Engineering	3
CVEN 4333 Engineering Hydrology	3

Group B

CVEN 3525 Structural Analysis	3
CVEN 3708 Geotechnical Engineering 1	3
CVEN 4545 Steel Design	3
CVEN 4555 Reinforced Concrete Design	3

Group C

AREN 3010 Mechanical Systems for Buildings	3
AREN 3540 Illumination I	3

Total Credit Hours	60
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Students wishing to enroll in CVEN courses that are restricted to majors only must do so through the CVEN advisor.

The Applied Mathematics and Civil Engineering departments offer a streamlined dual-degree track for talented students who are interested in analytical and computational methods related to civil engineering and general engineering science. Students can complete a double major from both programs with a minimum of 143 credits. Consult APPM-CVEN double major program faculty advisors in Applied Mathematics and Civil Engineering for additional information.

IX. Actuarial Option

BCOR 1025, is a prerequisite for BCOR 2200 and BCOR 2002. Students are advised to substitute an applied math prob/stats course for this prerequisite.

The following courses should be taken:	24
BCOR 2002 Principles of Accounting and Finance (prerequisite waived for Actuarial Certificate students)	3
ECON 2010 Principles of Microeconomics ¹	4
ECON 2020 Principles of Macroeconomics ¹	4
ECON 3070 Intermediate Microeconomic Theory ^{2,4}	4
ECON 3080 Intermediate Macroeconomic Theory ^{2,4}	3
ECON 4070 Topics in Microeconomics	3
FNCE 3010 Corporate Finance ^{2,4}	3
Some (or all) of the following courses should be taken:	3-9
FNCE 3030 Investment and Portfolio Management	3
FNCE 4040 Derivative Securities ⁵	3
ECON 4818 Introduction to Econometrics	3

Total Credit Hours	60-66
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Students are required to take APPM 3570³, APPM 4520^{2,6}, and APPM 4540^{2,6} for the actuarial option. Students are strongly advised to take APPM 4560⁶.

Additional courses that may be useful include ACCT 3220, ACCT 3230, and BCOR 3000. These courses can be taken only if space is available on the first day of the semester.

- ¹ ECON 2010 and ECON 2020 may not count toward the 24 credit hours of the option requirement; however, they can be used to meet the 18-credit-hour social science/humanities requirement of the College of Engineering.
- ² The Society of Actuaries requires students to take certain college courses that will earn the Validation by Educational Experiences (VEE) credit. Courses marked with a ² satisfy this requirement, provided a grade of B- or better is obtained. These courses are also required for students completing the Actuarial Certificate Program. VEE credit is granted for both BCOR 2200 and FNCE 3010.
- ³ The first actuarial examination, Exam P/1, can be taken after completing this course.
- ⁴ The second actuarial examination, Exam FM/2, can be taken after completing these courses, as well as a self-study in interest theory.
- ⁵ The third actuarial examination, Exam MFE/3, can be taken after completing APPM 4560, FNCE 4040, and an independent study.
- ⁶ The fourth actuarial examination, Exam C/4, can be taken after completing these courses.

X. Finance Option

BCOR 1025 is a prerequisite for BCOR 2200 and BCOR 2002. Students are advised to substitute an applied math prob/stats course for this prerequisite.

Recommended basic courses:		14-16
BCOR 2002	Principles of Accounting and Finance	3
FNCE 3010	Corporate Finance	3
ECON 2010	Principles of Microeconomics ¹	4
ECON 2020	Principles of Macroeconomics ¹	4
ECON 3070	Intermediate Microeconomic Theory	4
ECON 3080	Intermediate Macroeconomic Theory	3
ECON 4818	Introduction to Econometrics	3
Select a minimum of two of the following courses in order to meet the 24 credit hour requirements of the option. All of them must be taken to complete the requirements of the Quantitative Finance Certificate Program:		8-10
ACCT 3220	Corporate Financial Reporting 1	3
FNCE 3030	Investment and Portfolio Management	3
FNCE 4040	Derivative Securities	3
FNCE 4820	Topics in Finance	3
FNCE 4070	Financial Markets and Institutions	3
Total Credit Hours		61-65

¹ ECON 2010, ECON 2020 may not count toward the 24 credit hours of the option requirement; however, they can be used to meet the 18-credit-hour social science/humanities requirement of the College of Engineering.

Students are required to take APPM 3570 and APPM 4520 as part of the major's required 24 credits at 3000-level or above, for the finance option. Students are advised to take APPM 4560 and APPM 4540 if time permits.

Additional courses that may be taken as time permits:

ACCT 3230	Corporate Financial Reporting 2	3
FNCE 4000	Financial Institutions Management	3
FNCE 4050	Capital Investment Analysis	3
FNCE 4060	Special Topics in Finance	1-6

Advising note: Students wishing to take College of Business courses cannot register until the first day of classes. However, students can register for BCOR/FNCE courses in summer sessions. Alternatively, students can apply for admittance to the Actuarial Studies and Quantitative Finance Certificate Program (<http://www.colorado.edu/asqf/>). Students accepted into this program receive preferential treatment with respect to other non-business students when registering for business courses. For more information, please see your applied math advisor.

XI. Computational Biology and Bioinformatics Option

The following concentration of selected courses from computer science, biology and chemistry provide the foundation for work in mathematical biology, computational biology and/or bioinformatics.

Required courses:

CSCI 2270	Computer Science 2: Data Structures (Note: CSCI 1300 is a prerequisite for CSCI 2270)	4
CHEM 3311 & CHEM 3321	Organic Chemistry 1 and Laboratory in Organic Chemistry 1	5
MCDB 1150 & MCDB 1151	Introduction to Cellular and Molecular Biology and Introduction to Cell and Molecular Biology Lab	4
MCDB 2150 & MCDB 2151	Principles of Genetics and Principles of Genetics Laboratory	4
MCDB 3135 & MCDB 3140	Molecular Cell Biology I and Cell Biology Laboratory	5
CSCI 4314	Algorithms for Molecular Biology	3
Total Credit Hours		25

Advising Note: Students selecting this option are advised to take APPM 3570, APPM 4520, APPM 4540, and APPM 4390 as part of their applied math course work. Other recommended courses include CSCI 3104 and CSCI 3287.

Sample Curriculum for the BS Degree in Applied Mathematics

(128 Hours needed for graduation)

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
CHEN 1211	General Chemistry for Engineers	4

CHEM 1221	Engineering General Chemistry Lab	1
CSCI 1300	Computer Science 1: Starting Computing	4
Humanities or Social Sciences Elective ¹		3
		Credit Hours 16
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
PHYS 1110	General Physics 1	4
Free Electives		6
Humanities or Social Sciences Elective ¹		3
		Credit Hours 17
Year Two		
Fall Semester		
APPM 2350	Calculus 3 for Engineers	4
APPM 2450	Calculus 3 Computer Lab (Recommended, Not Required)	1
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Technical Electives (Area of Emphasis)		3
Humanities or Social Sciences Elective ¹		3
		Credit Hours 16
Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
APPM 2460	Differential Equations Computer Lab (Recommended but not required)	1
APPM 3310	Matrix Methods and Applications	3
Technical Electives (Area of Emphasis)		3
Free Electives		3
Humanities or Social Sciences Elective ¹		3
		Credit Hours 17

Year Three**Fall Semester**

APPM 4350	Methods in Applied Mathematic: Fourier Series and Boundary Value Problems	3
APPM 4440	Undergraduate Applied Analysis 1	3
Technical Electives (Area of Emphasis)		6
College-approved writing course ²		3
		Credit Hours 15

Spring Semester

APPM 3XXX		3
APPM 4360	Methods in Applied Mathematic: Complex Variables and Applications	3
Technical Electives (Area of Emphasis)		3
Free Electives		3
Humanities or Social Sciences Elective ¹		3
		Credit Hours 15

Year Four**Fall Semester**

APPM 4650	Intermediate Numerical Analysis 1	3
APPM 4XXX		3
Technical Electives (Area of Emphasis)		6
Free Electives		4
		Credit Hours 16

Spring Semester

APPM 4660 or Senior Sequence	Intermediate Numerical Analysis 2 or	3
APPM 4XXX		3
Technical Electives (Area of Emphasis)		3
Free Electives		7
		Credit Hours 16
		Total Credit Hours 128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Chemical and Biological Engineering

The Department of Chemical and Biological Engineering (<http://www.colorado.edu/chbe>) offers degrees at the bachelor's, master's and doctoral levels. The department offers two distinct BS degree

programs, one in chemical engineering and one in chemical and biological engineering. Both programs are accredited by the Engineering Accreditation Commission of ABET (<http://www.abet.org>).

The standard chemical engineering undergraduate program includes curricular options in energy, materials, and premedicine. There are active and exciting research and educational programs in biotechnology, pollution control, novel membrane separations, and advanced polymeric and ceramic materials. Chemical engineering prepares students for careers in a range of industries including energy, consumer products, petrochemicals, semiconductors, medicine, environment, and materials. Modern industry depends on chemical engineers to tailor manufacturing technology to the requirements of its products, and chemical engineers play a central role in development of new polymeric materials, alternative energy sources, and safe, efficient processes for chemical synthesis.

The chemical and biological engineering undergraduate program prepares students for careers in biotechnology, pharmaceuticals, medicine, and materials. This degree program adapts a core chemical engineering curriculum to allow for greater depth in biological aspects of chemical engineering. Exploring the structure of protein molecules, the functioning of cells, and the growth and regeneration of tissues are among the new frontiers that chemical and biological engineering students will address.

In addition to the standard chemical and biological curriculum, a premedicine curriculum is also offered. The chemical and biological engineering department has active research and educational programs in the exciting field of biotechnology, which involves the use of individual cells and their components for producing pharmaceuticals and other important products. The department is also active in biomedical engineering, which involves medical devices, tissues and biomaterials.

There are opportunities to specialize via electives, independent study, and research, and the BS in chemical engineering also offers optional variations to the core curriculum that allow students to specialize in energy and materials aspects of chemical engineering.

Given the international nature of most large chemical and engineering corporations and international cooperation in scientific and engineering research, students may carry out part of their studies in another country and are encouraged to consider this opportunity. Many faculty members have significant international experience.

Course code for this program is CHEN.

Cooperative Education and Internships

The Department of Chemical and Biological Engineering offers a formal Co-Op Program, where students obtain a BS in chemical engineering or a BS in chemical and biological engineering and significant industrial experience in five years.

Senior Thesis

The department offers this program for undergraduates with a strong interest in research. The student carries out a yearlong project under the direction of a faculty member in lieu of taking CHEN 4130 (for ChE students) or CHEN 4810 (for ChBE students). Students must apply at the end of their junior year.

Research Facilities

Chemical and biological engineering research facilities are extensive and modern. Nearly all research equipment is interfaced to computers for automated data collection, monitoring, and control. A full description of

chemical engineering research facilities can be found on the department website. (<http://www.colorado.edu/chbe>)

Bachelor's Degrees

- Chemical and Biological Engineering Bachelor of Science (BS) (p. 647)
- Chemical Engineering Bachelor of Science (BS) (p. 649)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anseth, Kristi S (https://experts.colorado.edu/display/fisid_103471)
Distinguished Professor; PhD, University of Colorado Boulder

Bowman, Christopher (https://experts.colorado.edu/display/fisid_102043)
Distinguished ProfessorProfessor; PhD, Purdue University

Bryant, Stephanie J (https://experts.colorado.edu/display/fisid_111810)
Associate Professor; PhD, University of Colorado Boulder

Cha, Jennifer N (https://experts.colorado.edu/display/fisid_151746)
Associate Professor; PhD, University of California-Santa Barbara

Chatterjee, Anushree (https://experts.colorado.edu/display/fisid_151712)
Assistant Professor; PhD, University of Minnesota Central office

Clough, David Edwards (https://experts.colorado.edu/display/fisid_102332)
Professor; PhD, University of Colorado Boulder

Davis, Robert H (https://experts.colorado.edu/display/fisid_105896)
Professor; PhD, Stanford University

deGrazia, Janet (https://experts.colorado.edu/display/fisid_107661)
Senior Instructor; PhD, University of Colorado Boulder

Falconer, John L (https://experts.colorado.edu/display/fisid_101426)
Professor; PhD, Stanford University

Fox, Jerome Michael (https://experts.colorado.edu/display/fisid_156682)
Assistant Professor; PhD, University of California-Berkeley

Gill, Ryan T. (https://experts.colorado.edu/display/fisid_122697)
Professor; PhD, University of Maryland College Park Campus

Gin, Douglas L. (https://experts.colorado.edu/display/fisid_122861)
Professor; PhD, California Institute of Technology

Goodwin, Andrew Pratt (https://experts.colorado.edu/display/fisid_151595)
Assistant Professor; PhD, University of California-Berkeley

Heinz, Hendrik (https://experts.colorado.edu/display/fisid_156488)
Associate Professor; PhD, ETH Zurich (Switzerland)

Holewinski, Adam P (https://experts.colorado.edu/display/fisid_155859)
Assistant Professor; PhD, University of Michigan Ann Arbor

Hrenya, Christine M (https://experts.colorado.edu/display/fisid_113245)
Professor; PhD, Carnegie Mellon University

Kaar, Joel L. (https://experts.colorado.edu/display/fisid_148491)
Assistant Professor; PhD, University of Pittsburgh

Mahoney, Melissa J (https://experts.colorado.edu/display/fisid_129517)
InstructorLecturer; PhD, Cornell University

Medlin, James William (https://experts.colorado.edu/display/fisid_122699)
Professor; PhD, University of Delaware

Musgrave, Charles Bruce (https://experts.colorado.edu/display/fisid_144977)
Professor; PhD, California Institute of Technology

Nagpal, Prashant (https://experts.colorado.edu/display/fisid_151726)
Assistant Professor; PhD, University of Minnesota Central office

Noble, Richard D (https://experts.colorado.edu/display/fisid_101068)
Professor; PhD, University of California-Davis

Nuttelman, Charles Raymond (https://experts.colorado.edu/display/fisid_142758)
Instructor; PhD, University of Colorado Boulder

Randolph, Theodore W (https://experts.colorado.edu/display/fisid_101768)
Professor; PhD, University of California-Berkeley

Schwartz, Daniel K. (https://experts.colorado.edu/display/fisid_118479)
Professor; PhD, Harvard University

Shirts, Michael R (https://experts.colorado.edu/display/fisid_156474)
Associate Professor; PhD, Stanford University

Weimer, Alan W (https://experts.colorado.edu/display/fisid_109152)
Professor; PhD, University of Colorado Boulder

Young, Wendy Mores (https://experts.colorado.edu/display/fisid_146942)
Senior InstructorInstructor; PhD, University of Colorado Boulder

Courses

CHEN 1211 (4) General Chemistry for Engineers

One-semester lecture and recitation course designed to meet the general chemistry requirement for engineering students. Topics include stoichiometry; thermodynamics; gases, liquids, and solids; equilibrium; acids and bases; bonding concepts; kinetics; reactions; and materials science. Examples and problems illustrate the application of chemistry to engineering sub-disciplines. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra. Not recommended for students with grade below B- in CHEM 1021.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1113 or CHEM 1114 or CHEM 1400

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Corequisite CHEM 1221.

CHEN 1300 (1) Introduction to Chemical Engineering

Meets for one lecture per week. Introduces chemical engineering emphasizing history of the profession, curriculum, chemical industry, and industrial chemistry. Includes industry visits, oral presentations, faculty and professional meetings, and development of a goals statement.

Requisites: Restricted to Chemical (CHEN) Engineering or Chemical and Biological (CBEN) Engineering majors only.

CHEN 1310 (3) Introduction to Engineering Computing

Introduces the use of computers in engineering problem solving, including elementary numerical methods. Teaches programming fundamentals, including data and algorithm structure, and modular programming. Software vehicles include Excel/Vba and Matlab. Formerly GEEN 1300 and COEN 1300.

Requisites: Requires prerequisite or corequisite course of APPM 1340 or 1345 or 1350 or MATH 1300 (minimum grade C-). Restricted to College of Engineering majors or Pre-Engineering Arts and Sciences (PREN-COS) students only.

CHEN 2120 (3) Chemical Engineering Material and Energy Balances

Provides a basic understanding of chemical engineering calculations involving material and energy balances around simple chemical processes.

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEN 1310 (formerly GEEN 1300/COEN 1300; all minimum grade C-).

CHEN 2810 (3) Biology for Engineers

Develops a basic understanding of the science of biology, including an introduction to the disciplines of biochemistry, cell organization, metabolism, genetics, genomics, molecular biology, recombinant DNA technology and evolution. Provides a basic introduction to several key techniques used in biological engineering laboratories. Uses examples of complex and creative structures engineered by natural processes.

CHEN 2840 (1-4) Independent Study

Available to sophomores with approval of Department of Chemical Engineering. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours.

CHEN 3010 (3) Applied Data Analysis

Teaches students to analyze and interpret data. Topics include engineering measurements, graphical presentation and numerical treatment of data, statistical inference, and regression analysis.

Requisites: Requires prerequisite course of CHEN 1310 (formerly GEEN 1300/COEN 1300) and APPM 2360 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

CHEN 3200 (3) Chemical Engineering Fluid Mechanics

Introduces fluid mechanics and momentum transfer, emphasizing the application of these principles to chemical engineering systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 3313 and GEEN 3853 and MCEN 3021

Requisites: Requires prerequisite courses of APPM 2350 (min grade C-) or MATH 2400 (min grade C-) and CHEN 2120 (min grade C-) or MCEN 2023 (min grade C). Requires corequisite course of APPM 2360. Restricted to College of Engineering majors only.

CHEN 3210 (3) Chemical Engineering Heat Transfer

Examines conservation and transfer of thermal energy. Focuses on conduction and convection of heat in the context of chemical processes, with a special focus on heat exchangers. Also studies thermal radiation.

Requisites: Requires prerequisite course of either CHEN 3200 or MCEN 3021 (minimum grade C-). Restricted to College of Engineering majors only

CHEN 3220 (3) Chemical Engineering Separations and Mass Transfer

Studies separation methods including distillation, absorption, and extraction, and graphical and computer-based solutions to separation problems. Also studies mass transfer rate processes, including diffusion, microscopic material balances, and correlations for mass transfer coefficients. Applies mass transfer rate theory to packed and tray columns.

Requisites: Requires prerequisite courses of CHEN 3210 or MCEN 3022 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 3320 (3) Chemical Engineering Thermodynamics

Applies thermodynamic principles to nonideal systems, phase equilibrium, chemical equilibrium, power generation, refrigeration, and chemical processes.

Requisites: Requires prerequisite courses of CHEN 2120 (minimum grade C) and CHEN 4521 or CHEM 4511 and CHEM 4531 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 3660 (3) Energy Fundamentals

Explains the most important energy technologies and systems; provides tools to analyze performance using science and engineering principles. This course will investigate important energy concepts from sources and extraction to utilization, storage and efficiency. Topics include fossil fuels, hydropower, renewable energy, biofuels, carbon capture and waste disposal.

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and PHYS 1110 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering majors only.

Grading Basis: Letter Grade

CHEN 3840 (1-4) Independent Study

Available to juniors with approval of the Department of Chemical Engineering. Subject arranged to fit needs of the student.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 3930 (6) Chemical Engineering Cooperative Education

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program. 00 GPA or higher.

Requisites: Requires prerequisite course of CHEN 2120 (minimum grade C). At least a 2.85 cumulative GPA is required. Restricted to College of Engineering majors only.

Recommended: Prerequisite 3.

CHEN 4010 (2) Chemical Engineering Senior Thesis 1

Provides an opportunity for advanced students to conduct exploratory research in chemical engineering.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 4020 (2) Chemical Engineering Senior Thesis 2

Continuation of CHEN 4010. This course and CHEN 4020 can substitute for CHEN 4130.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 4090 (1) Undergraduate Seminar

Provides chemical engineering career and professional information, facilitates contact with faculty and industry representatives, and improves communication and leadership skills. Consists of a series of seminars and field trips and requires a research project involving a written and oral report.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 4130 (3) Chemical Engineering Laboratory

Involves planning and execution of chemical engineering experiments on mass transfer operations, separations, and chemical reactors. Interprets experimental data with theoretical principles and statistical analysis.

Emphasizes communication with written memos, full reports, and oral presentations.

Requisites: Requires prerequisite courses of CHEN 3010 and CHEN 3220 and CHEN 3320 and CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4330 (3) Chemical Engineering Reaction Kinetics

Introduces chemical kinetics and chemical reactor design. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, and multiple steady states in reactors.

Requisites: Requires prerequisite courses of CHEN 3320 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4440 (3) Chemical Engineering Materials

Introduces materials engineering, including properties of polymers, metals, ceramics, and semiconductors, especially as related to chemical engineering processes.

Requisites: Requires prerequisite courses of CHEN 3320 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4450 (3) Polymer Chemistry

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5450

Requisites: Requires prerequisite courses of CHEN 4830 or CHEN 4330 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4460 (3) Polymer Engineering

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5460

Requisites: Requires prerequisite courses of CHEM 3311 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4520 (3) Chemical Process Synthesis

Studies applied chemical process design including equipment specification and economic evaluation.

Requisites: Requires prerequisite courses of CHEN 3010 and CHEN 3210 or MCEN 3022 and CHEN 3220 and CHEN 4330 or CHEN 4830 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4521 (3) Physical Chemistry for Engineers

Examines the laws of classical thermodynamics followed by physical transformations of pure substances, the thermodynamics of simple mixtures and chemical equilibrium. Applies quantum theory to atomic and molecular structure. Presents the concepts and applications of statistical thermodynamics. Introduces rates of chemical reactions, reaction dynamics and catalysis.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires a corequisite course of APPM 2360. Restricted to College of Engineering majors only.

CHEN 4530 (2) Chemical Engineering Design Project

Provides a team-based capstone design experience for chemical engineering students. Projects are sponsored by industry and student design teams collaborate with industrial consultants. Projects consider chemical process and product design with emphasis on economic analysis. Deliverables include an oral mid-project design review, a final oral presentation and final written design report.

Requisites: Requires prerequisite course of CHEN 4520 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4570 (4) Instrumentation and Process Control

Examines principles of control theory and their application to chemical processes. Focuses on single-loop feedback and feedforward control. Laboratory sessions cover measurement fundamentals, signal transmission, dynamic testing, control system synthesis, and implementation and adjustment.

Requisites: Requires prerequisite courses of CHEN 3220 and CHEN 4330 or CHEN 4830 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4630 (1) Intellectual Property Law and Engineering

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5630

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 4650 (3) Particle Technology

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5650

Requisites: Requires prerequisite courses of APPM 2360 and CHEN 3200 or MCEN 3021 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4801 (3) Pharmaceutical Biotechnology

Focuses on the engineering needed to bring therapeutic products derived from living organisms (e.g., proteins, peptides, DNA, RNA) from the production plant to the patient. Covers the challenges of keeping these products "active" as they are stored, shipped, and administered to patients.

Requisites: Requires prerequisite courses of CHEN 3320 and prerequisite or corequisite courses of CHEN 4830 or CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4802 (3) Tissue Engineering and Medical Devices

The purpose of this course is to develop a basic understanding of quantitative and qualitative aspects of tissue engineering and medical devices. Particular emphasis will be placed on topics of potential importance and significance to chemical and biological engineers. Students will be introduced to important professional, societal and entrepreneurial issues in the field by examining case studies in which drugs and medical products have been developed or are being considered for FDA approval and clinical use.

Requisites: Requires prerequisite course of CHEN 2810 or MCDB 1150 or EBIO 1210 and EBIO 1220 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

CHEN 4803 (3) Metabolic Engineering

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5803

Requisites: Requires prerequisite course of CHEM 4700 or CHEM 4611 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4805 (3) Biomaterials

Provides an overview of biomaterials. Covers major classes of materials used in medical applications, properties, degradation mechanisms, and characterization methods, foreign body response, methods to control physiological response to biomaterial surfaces, biocompatibility, biomaterials used in soft and hard tissue replacements, drug delivery devices and tissue engineering, and design criteria for developing a material for a given biological application.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5805

Requisites: Requires a prerequisite course of CHEN 2810 or MCDB 1150 or EBIO 1220 and 1230 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4810 (3) Biological Engineering Laboratory

Involves planning and execution of chemical engineering experiments on mass transfer operations, bioseparations, and biological reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports and oral presentations.

Requisites: Requires prerequisite courses of CHEN 2810 or MCDB 1150 and CHEN 3010 and CHEN 4830 (all minimum grade C-). Requires a corequisite course of CHEN 4820. Restricted to College of Engineering majors only.

CHEN 4820 (3) Biochemical Separations

Lect. and lab. Presents purification methods, mass transfer coefficients, problems specific to biologicals, and scale-up of processes. Also covers chromatography, phase extraction, supercritical fluids, sedimentation, precipitation, electrophoresis, dialysis, affinity techniques, cell separation, application of separations to bioreactors, and comparison of batch and continuous processes.

Requisites: Requires prerequisite course of CHEN 3220 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4830 (3) Chemical Engineering Biokinetics

Introduces chemical kinetics, chemical reactor design, and biological kinetics. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, multiple steady states in reactors, enzyme kinetics, metabolic networks, and cell growth kinetics.

Requisites: Requires prerequisite course of CHEN 3320 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4836 (3) Nanomaterials

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5836

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 4838 (1-3) Special Topics in Chemical Engineering

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 4840 (1-4) Independent Study

Available to seniors with approval of chemical engineering department. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

Chemical and Biological Engineering - Bachelor of Science (BS)

Program Educational Objectives

The department prepares its graduates to make significant contributions in many diverse areas. Specifically, within a few years of graduation our graduates will have achieved one or more of the following attributes:

- In their chosen field, be established in a professional career, be pursuing an advanced degree, or be seeking advanced certification.
- Be recognized as academic, industrial, or entrepreneurial leaders.
- Be successfully working and communicating in a variety of technical fields.
- Be adapting to new technologies and changing professional environments.

Program Outcomes

At the time of graduation, graduates will demonstrate:

- an ability to apply knowledge of mathematics, science, and engineering
- an ability to design and conduct experiments, as well as to analyze and interpret data
- an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental,

social, political, ethical, health and safety, manufacturability, and sustainability

- an ability to function on multidisciplinary teams
- an ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibility
- the appropriate written and verbal communication skills required to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- a recognition of the need for, and an ability to engage in, lifelong learning
- a knowledge of contemporary issues
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice
- an ability to apply engineering to biological systems
- a knowledge of advanced biological concepts

Premed Track

This track is offered for students preparing for medical school. Since chemical engineering already requires most of the premed courses, it is a logical choice for students who desire an engineering degree and the opportunity to pursue a medical profession. For information on the premed track, visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

Concurrent Degree Program

BS/MS in Chemical and Biological Engineering and Chemical Engineering

The concurrent BS/MS program in the Department of Chemical and Biological Engineering enables especially well qualified students to work concurrently towards a BS in chemical and biological engineering and a MS degree in chemical engineering. Students are admitted into the program during the spring of their junior year and begin planning a graduate program. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of their BS degree requirements. Up to 6 credit hours may be counted towards both the BS and MS degree programs.

Requirements

Recommended Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
CHEN 1211	General Chemistry for Engineers	4
CHEN 1221	Engineering General Chemistry Lab	1

CHEN 1310	Introduction to Engineering Computing	3
Humanities or social science elective ²		3
		Credit Hours 15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
CHEN 1300	Introduction to Chemical Engineering 1	1
CHEN 2810	Biology for Engineers	3
PHYS 1110	General Physics 1	4
Humanities or social science elective ²		3
		Credit Hours 15
Year Two		
Fall Semester		
APPM 2350	Calculus 3 for Engineers	4
CHEM 3311	Organic Chemistry 1	4
CHEM 3321	Laboratory in Organic Chemistry 1	1
CHEN 2120	Chemical Engineering Material and Energy Balances	3
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
		Credit Hours 17
Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
CHEM 3331	Organic Chemistry 2	4
CHEM 3341	Laboratory in Organic Chemistry 2	1
CHEN 3200	Chemical Engineering Fluid Mechanics 1	3
CHEN 4521	Physical Chemistry for Engineers 1	3
Humanities or social science elective ²		3
		Credit Hours 18

Year Three		
Fall Semester		
CHEN 3320	Chemical Engineering Thermodynamics 1	3
CHEN 3010	Applied Data Analysis 1	3
CHEN 3210	Chemical Engineering Heat Transfer 1	3
College-approved writing course ⁶		3
Free Electives ³		5
		Credit Hours 17
Spring Semester		
CHEN 4611	Survey of Biochemistry 4	3
CHEN 4090	Undergraduate Seminar 1	1
CHEN 3220	Chemical Engineering Separations and Mass Transfer 1	3
CHEN 4805	Biomaterials 1	3
CHEN 4830	Chemical Engineering Biokinetics 1	3
Humanities or social science elective ²		3
		Credit Hours 16
Year Four		
Fall Semester		
CHEN 4520	Chemical Process Synthesis 1	3
CHEN 4810	Biological Engineering Laboratory 1	3
CHEN 4820	Biochemical Separations 1	3
Technical Electives ³		6
		Credit Hours 15
Spring Semester		
CHEN 4530	Chemical Engineering Design Project 1	2
CHEN 4570	Instrumentation and Process Control 1	4
Technical Elective ³		3
Focus Tech Elective ⁵		3

Humanities or social science elective ²	3
Credit Hours	15
Total Credit Hours	128

- ¹ Course is offered only in the semester indicated.
- ² Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives on the college's Humanities, Social Sciences and Writing Requirements (<http://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>) webpage.
- ³ Electives must meet specific requirements. Visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.
- ⁴ Alternate is CHEM 4700 and either CHEM 4720 or CHEM 4740.
- ⁵ One of the following courses must be taken as the focus technical elective: Pharmaceutical Biotechnology (CHEN 4801, 3), Tissue Engineering and Medical Devices (CHEN 4802, 3) or Metabolic Engineering (CHEN 4803, 3). These courses will be taught in alternating years and should be taken in the junior or senior year as available.
- ⁶ Students may choose a course from the list of college-approved writing courses on the college's Humanities, Social Sciences and Writing Requirements (<http://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>) webpage.

Chemical Engineering - Bachelor of Science (BS)

Chemical engineers are responsible for producing products based on chemical processing and chemical transformations. They carry out basic research# they design, build, operate and manage chemical processes and plants# and they supply petroleum products, renewable resources, plastics, detergents, agricultural chemicals, pharmaceuticals, biological compounds, photographic materials, microelectronic devices and various food and other products. Today's processes must be energy efficient, nonpolluting and profitable. Thus, students must master inorganic, organic and physical chemistry, mathematics, statistics, computers, physics and often biology and biochemistry. Students must learn to apply these fundamentals in the process industries. Paralleling the technical courses are studies in the humanities and the social sciences.

Program Educational Objectives

The department prepares its graduates to make significant contributions in many diverse areas. Specifically, within a few years of graduation our graduates will have achieved one or more of the following attributes:

- In their chosen field, be established in a professional career, be pursuing an advanced degree or be seeking advanced certification.
- Be recognized as academic, industrial or entrepreneurial leaders.
- Be successfully working and communicating in a variety of technical fields.
- Be adapting to new technologies and changing professional environments

Program Outcomes

- an ability to apply knowledge of mathematics, science and engineering
- an ability to design and conduct experiments, as well as to analyze and interpret data
- an ability to design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability and sustainability
- an ability to function on multidisciplinary teams
- an ability to identify, formulate and solve engineering problems
- an understanding of professional and ethical responsibility
- the appropriate written and verbal communication skills required to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context
- a recognition of the need for, and an ability to engage in, lifelong learning
- a knowledge of contemporary issues
- an ability to use the techniques, skills and modern engineering tools necessary for engineering practice

Program Tracks

Curricular options have been established in fields of major importance and particular interest. To follow one of these options requires careful planning and course selection by student and advisor.

Energy Track

Chemical engineers continue to be involved with all aspects of energy, including traditional energy (petroleum) as well as solar and renewable sources of energy. This option supplements the standard curriculum with coursework that will provide a vital foundation for students wishing to enter the energy fields.

Materials Track

The need to develop new materials for a rapidly broadening spectrum of applications is one of the major technological challenges confronting applied science. Chemical engineers have the required background in chemistry and transport theory to contribute significantly in this area. This option focuses on polymeric and ceramic materials by complementing the chemical engineering curriculum with elective courses stressing the interrelationship between materials fabrication, structure, properties and performance.

Premed Track

This track is offered for students preparing for medical school. Since chemical and engineering already requires most of the premed courses, it is a logical choice for students who desire an engineering degree and the opportunity to pursue a medical profession.

Concurrent Degree Program BS/MS in Chemical Engineering

The concurrent BS/MS program in the Department of Chemical and Biological Engineering enables especially well qualified students to work concurrently towards a BS in chemical engineering and a MS degree in chemical engineering. Students are admitted into the program during the spring of their junior year and begin planning a graduate

program. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of their BS degree requirements. Up to six credit hours may be counted towards both the BS and MS degree programs.

Requirements

General Program Requirements

While there are several tracks, only the Standard Curriculum is shown here. For details on the other tracks, visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

Recommended Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CHEM 1211	General Chemistry for Engineers	4
CHEM 1310	Introduction to Engineering Computing	3
Humanities or social science elective ²		3
	Credit Hours	15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
CHEM 1300	Introduction to Chemical Engineering ¹	1
CHEM 2810	Biology for Engineers	3
PHYS 1110	General Physics 1	4
Humanities or social science elective ²		3
	Credit Hours	15
Year Two		
Fall Semester		
APPM 2350	Calculus 3 for Engineers	4
CHEM 3311	Organic Chemistry 1	4
CHEM 3321	Laboratory in Organic Chemistry 1	1
CHEM 2120	Chemical Engineering Material and Energy Balances	3

PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
	Credit Hours	17
Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
CHEM 3331	Organic Chemistry 2	4
CHEM 3341	Laboratory in Organic Chemistry 2	1
CHEM 3200	Chemical Engineering Fluid Mechanics 1	3
CHEM 4521	Physical Chemistry for Engineers ¹	3
Humanities or social science elective ²		3
	Credit Hours	18
Year Three		
Fall Semester		
CHEM 3320	Chemical Engineering Thermodynamics ¹	3
CHEM 3010	Applied Data Analysis ¹	3
CHEM 3210	Chemical Engineering Heat Transfer ¹	3
College-approved writing course ⁵		3
Free Electives ³		5
	Credit Hours	17
Spring Semester		
CHEM 3220	Chemical Engineering Separations and Mass Transfer ¹	3
CHEM 4090	Undergraduate Seminar ¹	1
CHEM 4330	Chemical Engineering Reaction Kinetics ¹	3
CHEM 4440	Chemical Engineering Materials ¹	3
Advanced Chemistry Elective ⁴		3
Technical Elective ³		3
	Credit Hours	16

Year Four**Fall Semester**

CHEN 4130	Chemical Engineering Laboratory ¹	3
CHEN 4520	Chemical Process Synthesis ¹	3
CHEN 3000+ Technical Elective ³		3
Technical Elective ³		3
Humanities or social science elective ²		3
	Credit Hours	15

Spring Semester

CHEN 4530	Chemical Engineering Design Project ¹	2
CHEN 4570	Instrumentation and Process Control ¹	4
CHEN 3000+ Technical Elective ³		3
Technical Elective ³		3
Humanities or social science elective ²		3
	Credit Hours	15
	Total Credit Hours	128

¹ Course is offered only in the semester indicated.

² Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives on the college's Humanities, Social Sciences and Writing Requirements (<http://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>) webpage.

³ Electives must meet specific requirements. Visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

⁴ For information about chemistry electives, visit the department's Current Students (<http://www.colorado.edu/chbe/academics/undergraduate-program/current-students>) webpage and consult the current advising guide.

⁵ Students may choose a course from the list of college-approved writing courses on the college's Humanities, Social Sciences and Writing Requirements (<http://www.colorado.edu/engineering-advising/get-your-degree/degree-requirements/humanities-social-sciences-and-writing-requirements>) webpage.

Civil, Environmental & Architectural Engineering

Civil Engineering

Civil engineering offers a wide range of careers for students interested in the planning, design, and construction management of facilities essential to modern life in both the public and private sectors. Varying widely in nature, size and scope, such facilities include buildings, bridges, tunnels, highways, transit systems, dams, airports, irrigation projects, water treatment and distribution facilities, waste treatment and processing

facilities, structures for space exploration, and offshore engineering designs applications.

In the coming decades, almost two billion more people will populate earth in both developed and developing countries. This growth will create unprecedented demands and opportunities for new methods and innovations in energy production, food supply, land development, water treatment, transportation systems, materials processing, waste disposal, healthcare delivery, environmental preservation and structural designs. Civil engineers play both direct and indirect roles in meeting many of these needs, with the goal of providing and improving the quality and infrastructure of life.

Environmental Engineering

Environmental engineering plays a vital role in maintaining the quality of both public health and the natural environment. Environmental engineering encompasses the scientific assessment and development of sustainable engineering solutions to environmental problems impacting the biosphere and land, water, and air quality. Environmental issues affect almost all commercial and industrial sectors, and are a central concern for the public, for all levels of government and in international relations.

In common with other engineering fields, courses in solid mechanics, fluid dynamics, and thermal sciences are central to the environmental engineering degree. Course work specific to environmental engineering includes environmental chemistry and microbiology, as well as treatment processes and approach.

Architectural Engineering

Architectural engineering prepares students for leadership careers in the building design, consulting, construction, and management industry and for research at the graduate level on building- and sustainability-related topics. In particular, the architectural engineering program prepares students to design, build and operate facilities that improve our quality of life. This course of study fulfills the academic requirements for registration as a professional engineer.

The architectural engineering curriculum is recommended for those wishing to specialize within the building industry in engineering design (heating, cooling, illumination, electrical, solar, and structures) or construction and contracting (facilities management). Architectural engineering students may select from several concentration areas, including: structural systems; mechanical systems (heating, ventilating and air conditioning); lighting and electrical systems; and construction engineering and management.

Course codes for these programs are AREN, CVEN and EVEN.

Bachelor's Degrees

- Architectural Engineering - Bachelor of Science (BS) (p. 672)
- Civil Engineering - Bachelor of Science (BS) (p. 674)
- Environmental Engineering - Bachelor of Science (BS) (p. 676)

Minors

- Architectural Engineering - Minor (p. 679)
- Civil Engineering - Minor (p. 680)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amadei, Bernard (https://experts.colorado.edu/display/fisid_105978)
Professor; PhD, University of California-Berkeley

Amy, Gary L.
Professor Emeritus

Balaji, Rajagopalan (https://experts.colorado.edu/display/fisid_118480)
Professor; PhD, Utah State University

Ball, L. Duane
Professor Emeritus

Beamer, Charles Walter (https://experts.colorado.edu/display/fisid_151044)
Instructor; PhD, University of Colorado Boulder

Bielefeldt, Angela R (https://experts.colorado.edu/display/fisid_110322)
ProfessorAssociate ProfessorLecturer; PhD, University of Washington

Brandemuehl, Michael J.
Professor Emeritus

Chinowsky, Paul (https://experts.colorado.edu/display/fisid_125496)
Professor; PhD, Stanford University

Chung Feng, Chuan
Professor Emeritus

Cook, Sherri M. (https://experts.colorado.edu/display/fisid_154773)
Assistant Professor; PhD, University of Michigan Ann Arbor

Corotis, Ross (https://experts.colorado.edu/display/fisid_100942)
Professor; PhD, Massachusetts Institute of Technology

Corwin, Christopher J (https://experts.colorado.edu/display/fisid_149043)
Instructor; PhD, University of Colorado Boulder

Crimaldi, John (https://experts.colorado.edu/display/fisid_115733)
ProfessorAssociate Professor; PhD, Stanford University

Dashti, Shideh (https://experts.colorado.edu/display/fisid_148493)
Assistant Professor; PhD, University of California-Berkeley

Diekmann, James E.
Professor Emeritus

Dilaura, David L.
Professor Emeritus

Dow, John O.
Professor Emeritus

Frangopol, Dan M.
Professor Emeritus

Goble, George G.
Professor Emeritus

Goodrum, Paul M. (https://experts.colorado.edu/display/fisid_151965)
Professor; PhD, University of Texas at Austin

Gooseff, Michael N (https://experts.colorado.edu/display/fisid_155922)
Associate Professor; PhD, University of Colorado Boulder

Gupta, Vijay
Professor Emeritus

Hallowell, Matthew Ryan (https://experts.colorado.edu/display/fisid_146163)
Associate Professor; PhD, Oregon State University

Hearn, George (https://experts.colorado.edu/display/fisid_101059)
Associate Professor; PhD, Columbia University In the City of New York

Henze, Gregor P. (https://experts.colorado.edu/display/fisid_146496)
Professor; PhD, University of Colorado Boulder

Hernandez, Mark T (https://experts.colorado.edu/display/fisid_107635)
Professor; PhD, University of California-Berkeley

Hubler, Mija H. (https://experts.colorado.edu/display/fisid_155134)
Assistant Professor; PhD, Northwestern University

Javernick-Will, Amy N (https://experts.colorado.edu/display/fisid_146430)
Associate ProfessorAssistant Professor; PhD, Stanford University

Kasprzyk, Joseph R. (https://experts.colorado.edu/display/fisid_151506)
Assistant Professor; PhD, Pennsylvania State University

Koster, Hon-Yim
Professor Emeritus

Krarti, Moncef (https://experts.colorado.edu/display/fisid_104154)
Professor; PhD, University of Colorado Boulder

Kreider, Jan F.
Professor Emeritus

Liel, Abbie Boggiano (https://experts.colorado.edu/display/fisid_146431)
Associate ProfessorAssistant Professor; PhD, Stanford University

Linden, Karl G. (https://experts.colorado.edu/display/fisid_143747)
Professor; PhD, University of California-Davis

Livneh, Ben (https://experts.colorado.edu/display/fisid_151999)
Assistant Professor; PhD, University of Washington

McKnight, Diane Marie (https://experts.colorado.edu/display/fisid_110517)
Professor; PhD, Massachusetts Institute of Technology

Molenaar, Keith Robert (https://experts.colorado.edu/display/fisid_102373)
Professor; PhD, University of Colorado Boulder

Montoya, Lupita Del Carmen (https://experts.colorado.edu/display/fisid_148045)
Assistant Professor; PhD, Stanford University

Neupauer, Roseanna Marie (https://experts.colorado.edu/display/fisid_134747)
Professor; PhD, New Mexico Institute of Mining and Technology

Pak, Ronald Y S (https://experts.colorado.edu/display/fisid_105977)
Professor; PhD, California Institute of Technology

Pfeffer, Tad (https://experts.colorado.edu/display/fisid_100207)
Professor; PhD, University of Washington

Porter, Keith Alan (https://experts.colorado.edu/display/fisid_145182)
Research Professor; PhD, Stanford University

Rajaram, Harihar (https://experts.colorado.edu/display/fisid_103246)
Professor; PhD, Massachusetts Institute of Technology

Regueiro, Richard A (https://experts.colorado.edu/display/fisid_134705)
Associate ProfessorAssistant Professor; PhD, Stanford University

Ren, Zhiyong (https://experts.colorado.edu/display/fisid_153479)
Associate Professor; PhD, Pennsylvania State University Central Office

Rosario-Ortiz, Fernando L. (https://experts.colorado.edu/display/fisid_146165)
Associate ProfessorAssistant Professor; PhD, University of California-Los Angeles

Ryan, Joseph N (https://experts.colorado.edu/display/fisid_101037)
Professor; PhD, Massachusetts Institute of Technology

Saouma, Victor (https://experts.colorado.edu/display/fisid_100429)
Professor; PhD, Cornell University

Sideris, Petros (https://experts.colorado.edu/display/fisid_153057)
Assistant Professor; PhD, SUNY at Buffalo

Silverstein, Joann (https://experts.colorado.edu/display/fisid_101482)
Professor; PhD, University of California-Davis

Song, Jeong-Hoon (https://experts.colorado.edu/display/fisid_154468)
Assistant Professor; PhD, Northwestern University

Srubar III, Wilfred V. (https://experts.colorado.edu/display/fisid_153058)
Assistant Professor; PhD, Stanford University

Strzepek, Kenneth M.
Professor Emeritus

Sture, Stein (https://experts.colorado.edu/display/fisid_104029)
Professor; PhD, University of Colorado Boulder

Summers, Luis L.
Professor Emeritus

Summers, R Scott (https://experts.colorado.edu/display/fisid_113151)
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Tulin, Leonard G.
Professor Emeritus

Vasconez, Sandra L. (https://experts.colorado.edu/display/fisid_144198)
Senior Instructor; MA, University of Denver

Weers, Walter A.
Professor Emeritus

William, Kaspar J.
Professor Emeritus

Xi, Yunping (https://experts.colorado.edu/display/fisid_110518)
Professor; PhD, Northwestern University

Zhai, Zhiqiang (https://experts.colorado.edu/display/fisid_130604)
ProfessorAssociate Professor; PhD, Massachusetts Institute of Technology

Znidarcic, Dobroslov (https://experts.colorado.edu/display/fisid_104109)
Professor; PhD, University of Colorado Boulder

Courses

AREN 1027 (3) Engineering Drawing

Introduces engineering drawing including sections and dimensioning, print readings, computer 3D, and building information modeling (BIM).

Requisites: Restricted to Engineering Physics (EPEN), Architectural (AREN), General Engineering (GEEN) or Civil (CVEN) Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

AREN 1037 (3) Building Information Modeling

Learn to develop and communicate physical information using three-dimensional graphical systems including Computer-Aided Design (CAD) and Building Information Models (BIM). Learn to dimension and scale physical systems and interpret scaled drawings. Get experience with industry standard software tools (REVIT) used to produce design and construction documents, and apply BIM and CAD tools in a project producing scaled 3-D drawings.

Additional Information: Departmental Category: Miscellaneous

AREN 1316 (1) Introduction to Architectural Engineering

Surveys the broad subject of architectural engineering and professional practices. Includes professional design services, design documents, methods of construction delivery, materials for construction, codes and standards, life safety, professional ethics, structural systems, mechanical systems, electrical systems, and building systems integration.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

AREN 2050 (3) Building Materials and Systems

Covers the broad subject of building materials and systems. Includes a practical approach to assembly details, methods of construction, codes, foundations, steel, concrete, masonry, cladding, doors and windows, interiors, finishes, mechanical, plumbing, electrical, life safety and conveyance. Includes investigation of an existing facility along with a team presentation trends in commercial building construction.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Civil (CVEN) or Architectural (AREN) or GEEN (General) or Applied Mathematics (AMEN) majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 2110 (3) Thermodynamics

Explores fundamental principles of thermodynamics, including first and second law of thermodynamics, thermophysical properties, power and refrigeration cycles, gas mixtures and psychrometrics.

Requisites: Requires a prereq course of PHYS 1110 (min grade C-) and a prereq or coreq course of APPM 1360 or MATH 2300 (min grade C-). Restricted to AREN, CVEN or EVEN, GEEN, AMEN or EVENCVEN Concurrent Degree majors only.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence Departmental Category: Building Systems Engineering

AREN 2120 (3) Fluid Mechanics and Heat Transfer

Explores fundamental principles of fluid mechanics and heat transfer. Topics include fluid statics, momentum and energy conservations; laminar and turbulent viscous flows; conduction, convection and radiation heat transfer. Emphasizes topics and problems that are important to Architectural Engineers including flow of fluids in pipes and ducts, heat transfer in buildings and building systems.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400, and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 (all minimum grade C-). Requires corequisite course of APPM 2360. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 2830 (1-3) Special Topics

Supervised study of special topics of interest to students under instructor guidance.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Special Topics

AREN 3010 (3) Mechanical Systems for Buildings

Lecture course on the analysis and design of buildings and their systems to satisfy the requirements for a comfortable and healthy indoor environment. Examines psychometrics, thermal comfort, building heating and cooling loads, fluid flow basics, and HVAC components and systems.

Requisites: Requires prerequisite courses of AREN 2120 or MCEN 3021 and 3022 and AREN 2050 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 3050 (3) Environmental Systems for Buildings 1

Explores operations and architectural design strategies of environmental (climate) control systems in buildings with a focus on sustainability and resource efficiency. Topics include thermal comfort and indoor air quality, building thermal and moisture loads, HVAC equipment and systems and active and passive thermal strategies in buildings.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Program in Environmental Design major or minor students only. College of Engineering majors are excluded from this course.

Additional Information: Departmental Category: Building Systems Engineering

AREN 3060 (3) Environmental Systems for Buildings 2

Explores operations and architectural design strategies of plumbing, power distribution, renewable electricity generation, illumination, daylighting, acoustical control, vertical transportation, fire protection and telecommunication systems in buildings with a focus on sustainability and resource efficiency.

Requisites: College of Engineering majors are excluded from this course.

Additional Information: Departmental Category: Building Systems Engineering

AREN 3140 (3) Illumination Laboratory

Introduces the measurement of photometric and psychophysical quantities used in lighting. Experience is acquired in using light measurement instruments to evaluate lighting equipment and luminous environments. Taught intermittently.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 3540 (3) Illumination I

Studies the fundamentals of architectural illumination. Introduces and applies basic principles and vocabulary to elementary problems in the lighting of environments for the performance of visual work and the proper interaction with architecture.

Requisites: Requires prerequisite course of CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4010 (3) HVAC System Modeling and Control

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5010

Requisites: Requires prerequisite course of AREN 4110 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4035 (3) Architectural Structures 1

Analyzes basic structural systems. Covers principles of mechanics and mechanical properties of materials and analysis and design of trusses, arches, and cable structures. For nonengineering students; does not apply toward an engineering degree.

Requisites: Requires prerequisite course of PHYS 1110 or PHYS 2010 and APPM 1350 or MATH 1300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

Additional Information: Departmental Category: Structures

AREN 4045 (3) Architectural Structures 2

Analyzes basic structural systems. Covers principles of mechanics as applied to the design of flexural members, columns, continuous beams, and rigid frames. For nonengineering students; does not apply toward an engineering degree.

Requisites: Requires prerequisite course of AREN 4035 (minimum grade C-).

Additional Information: Departmental Category: Structures

AREN 4110 (3) HVAC Design

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5110

Requisites: Requires prerequisite course of AREN 3010 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4130 (3) Optical Design for Illumination and Solid State Lighting

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5130

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4315 (3) Design of Masonry Structures

Covers modern masonry construction; properties and behavior of the reinforced masonry component materials, clay and concrete masonry units, mortar, grout, and steel reinforcement; vertical and lateral load types and intensities; and design of reinforced masonry walls, beams, and columns by working stress and strength design methods.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

AREN 4317 (5) Architectural Engineering Design

Provides a capstone experience to AREN students. Students design a modest commercial building and complete an integrated engineering design of the building systems executed for the conceptual, schematic, and design development phases. Students' teams work on structural, mechanical, electrical/lighting, and construction engineering management design. Each stage produce a professional-quality design document. Faculty and industry mentors participate in the teaching and evaluation of designs.

Requisites: Requires prerequisite courses of ARCH 4010 and AREN 3010 and AREN 3540 and CVEN 3246 and CVEN 3525 and ECEN 3030 (all minimum grade C-).

Additional Information: Departmental Category: Miscellaneous

AREN 4506 (3) Pre-construction Estimating and Scheduling

Integrates project management methods with an emphasis on the techniques used to create bid-day budgets and schedules for architectural and civil engineering projects.

Requisites: Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Architectural (AREN), Civil (CVEN) or General (GEEN) Engineering majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Construction

AREN 4530 (3) Advanced Lighting Design

Intended to help students understand light as a medium in design, begin the formulation of a philosophical perspective for its application, and continue to develop the skills required to design and implement lighting systems. Knowledge from previous lighting classes (Illumination I and Illumination II) is essential to this course.

Requisites: Requires prerequisite courses of AREN 3540 and AREN 4550 (all minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4540 (3) Exterior Lighting Systems

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5540

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Recommended: Prerequisite AREN 4550.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4550 (3) Illumination 2

Applies the principles studied in Illumination 1. Provides further study in architectural lighting design methods. Uses lighting studio work to develop a broad knowledge of lighting equipment, design methods, and their application in a series of practical design problems in modern buildings.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4560 (3) Luminous Radiative Transfer

Teaches fundamentals of radiative exchange as applied to illumination engineering. Describes and uses principal numerical techniques for radiative transfer analysis. Applies techniques to lighting design and analysis. Taught intermittently.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4570 (3) Building Electrical Systems Design 1

Introduces the generation and distribution of electrical power. Focuses on understanding the loads, control, and protection of secondary electrical distribution systems in building. Applies the national electric code to residential and commercial buildings.

Requisites: Requires prerequisite course of ECEN 3030 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4580 (3) Daylighting

Applies the fundamental principles of illumination engineering to architectural daylighting design, exploring the quantitative methods and tools used to develop daylighting designs and evaluate their performance. Topics include solar and sky modeling, luminous radiative transfer, design methods, and controls for integration with electric lighting systems.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4590 (3) Computer Graphics in Lighting Engineering

Studies the numerical methods and computer implementation of computer graphics visualization for architectural lighting engineering and design. Implements finite element radiative transfer and ray-tracing in computer programs. Studies the use of computer graphics visualization in lighting analysis. Taught intermittently.

Requisites: Requires prerequisite courses of AREN 3540 and AREN 4560 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4606 (3) Construction Project Execution and Control

Integrates project execution and control techniques for construction scope, cost and schedule. Includes progress measurement, resource planning, earned value methods, productivity, risk management methods and key contract clauses.

Requisites: Requires prerequisite courses of CVEN 3246 and AREN 4506 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Construction

AREN 4830 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Special Topics

AREN 4836 (1-3) Special Topics For Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 30.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

AREN 4837 (3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Additional Information: Departmental Category: Special Topics

AREN 4849 (1-3) Independent Study

Offers an independent, in-depth study, research or design in a selected area of architectural engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

AREN 4890 (3) Sustainable Building Design

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5890

Requisites: Requires a prerequisite course of AREN 3010 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering students only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5990

Requisites: Requires prerequisite course of AREN 2120 and APPM 2360 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5010 (3) HVAC System Modeling and Control

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4010

Recommended: Prerequisite AREN 4140.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5020 (3) Building Energy Audits

Analyzes and measures performance of HVAC systems, envelopes, lighting and hot water systems, and modifications to reduce energy use. Emphasizes existing buildings.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5050 (3) Advanced Solar Design

Predicts performance and analyzes economics of low-temperature, high-temperature, photovoltaic, and other innovative solar systems. Also includes performance prediction methods for solar processes.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 2120.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5070 (3) Thermal Analysis of Buildings

Examines response factors, conduction transfer functions and weighting factors for dynamic analysis of building envelopes. Also studies radiative and convective exchange in buildings, internal gains and infiltration analysis as modeled in hourly simulations.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5080 (3) Computer Simulation of Building Energy Systems

Introduces major simulation programs for analysis of building energy loads and system performance. Focuses on one hourly simulation program to develop capability for analysis of multizone structure.

Requisites: Requires prerequisite course of AREN 4110 or AREN 5110 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5110 (3) HVAC Design

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4110

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5130 (3) Optical Design for Illumination and Solid State Lighting

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4130

Recommended: Prerequisite AREN 3540.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5540 (3) Exterior Lighting Systems

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4540

Recommended: Prerequisites AREN 3540 and AREN 4550.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5890 (3) Sustainable Building Design

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4890

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4990

Requisites: Restricted to graduate students only.

Recommended: Prerequisites AREN 2120 and APPM 2360.

Additional Information: Departmental Category: Building Systems Engineering

AREN 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Building Systems Engineering

AREN 6950 (1-6) Master's Thesis

Additional Information: Departmental Category: Building Systems Engineering

AREN 6960 (1-3) Master's Report

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Building Systems Engineering

AREN 8990 (1-10) Doctoral Thesis

A minimum of 30 credit hours is required.

Additional Information: Departmental Category: Building Systems Engineering

CVEN 1317 (1) Introduction to Civil and Environmental Engineering

Surveys the broad subject of civil and environmental engineering and professional practice. Includes the subdisciplines of structures, water resources, geotechnics, transportation, environment, and construction. Discusses professional ethics, important skills for engineers, and the engineering design process as it fulfills multiple objectives.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

CVEN 1837 (1-3) Special Topics

Supervised study of special topics of interest to student under instructor guidance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 2012 (3) Introduction to Geomatics

Presents basic techniques of land and construction surveying, including measurement of position, elevation, orientation and length of lines, area, volume and layout calculations. Optical, GPS and GIS equipment and methods are included.

Requisites: Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 2121 (3) Analytical Mechanics 1

Applies mechanics to the study of static equilibrium of rigid and elastic bodies. Includes composition/resolution of forces; moments/couples; equivalent force systems; free-body diagrams; equilibrium of particles and rigid bodies; forces in trusses/beams; frictional forces; first/second moments of area; moments and products of inertia.

Equivalent - Duplicate Degree Credit Not Granted: GEEN 2851 and MCEN 2023

Requisites: Requires a prereq course of PHYS 1110 (min grade C-). Requires a prereq or coreq course of APPM 2350 or MATH 2400 (min grade C-). Restricted CVEN or EVEN or AREN or AMEN or EPEN or GEEN majors with a CIV, ENR or ARC subplan.

Additional Information: Departmental Category: Mechanics

CVEN 2837 (1-3) Special Topics

Supervised study of special topics of interest to student under instructor guidance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 3022 (3) Construction Surveying

Studies construction and highway surveying, horizontal and vertical curves, earthwork, and analysis of data.

Requisites: Requires prerequisite course of CVEN 2012 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 3032 (3) Photogrammetry

Familiarizes students with characteristics of aerial photographs. Measures and interprets aerial photos for planimetric, topographic, hydrological, soil, and land use surveys. Analyzes and presents field measurements over extensive reaches.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 3111 (3) Analytical Mechanics 2

Studies the motion (kinematics) of particles and rigid bodies, and the forces that cause the motion (kinetics). Newton's laws as well as energy methods are used to study the motion of particles and rigid bodies in two and three dimensions.

Requisites: Requires prerequisite courses of CVEN 2121 (minimum grade C-). Requires a co-requisite course of APPM 2360. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Mechanics

CVEN 3141 (2) Engineering Materials Lab

Additional Information: Departmental Category: Mechanics

CVEN 3161 (3) Mechanics of Materials 1

Addresses concepts of stress and strain; material properties, axial loading, torsion, simple bending, and transverse shear; analysis of stress and strain; and deflections of beams. Includes selected experimental and computational laboratories.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 2063

Requisites: Requires prerequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) or Engineering Management (EMEN) or General (GEEN) Engineering majors with a CIV, ENR or ARC subplan.

Additional Information: Departmental Category: Mechanics

CVEN 3227 (3) Probability, Statistics and Decision

Introduces uncertainty based analysis concepts and applications in the planning and design of civil engineering systems emphasizing probabilistic, statistics, and design concepts and methods.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 3246 (3) Introduction to Construction

Provides a broad view of concerns, activities, and objectives of people involved in construction: the owner, architect/engineer, contractor, labor and inspector. Interactive gaming situation relates these people to the construction contract, plans/specifications, estimates/bids, scheduling, law and financial management. Students with a Business School Real Estate emphasis may be considered for this course.

Requisites: Restricted to students with 36+ units, Civil (CVEN) or Architectural (AREN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Construction

CVEN 3256 (3) Construction Equipment and Methods

Integrated study of construction equipment, methods, and economics. Topics include equipment productivity, equipment selection, and construction engineering design within economic constraints. Examples include earthmoving, concrete formwork, and temporary construction.

Requisites: Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Construction

CVEN 3313 (3) Theoretical Fluid Mechanics

Basic principles of fluid mechanic. Covers fluid properties, hydrostatics, fluid flow concepts, including continuity, energy, momentum, dimensional analysis and similitude and flow in closed conduits.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 3200 and GEEN 3853 and MCEN 3021

Requisites: Requires prerequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) majors, or General (GEEN) Engineering majors with a CIV or ENR subplan.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 3323 (3) Hydraulic Engineering

Studies hydraulic engineering theory and applications. Topics include incompressible flow in conduits, pipe system analysis and design, open channel flow, flow measurement, analysis and design of hydraulic machinery.

Requisites: Requires prerequisite course of CVEN 3313 or MCEN 3021 or GEEN 3853 or AREN 2120 or CHEN 3200 (all minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 3414 (3) Fundamentals of Environmental Engineering

Emphasizes chemical, ecological and hydrological fundamentals and importance of mass and energy balances in solving environmental engineering problems related to water quality, water and wastewater treatment, air pollution, solid and hazardous waste management, sustainability and risk assessment.

Requisites: Requires prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351 and APPM 1360 or MATH 2300 (all min grade C-). Restricted to CVEN, AREN, EVEN, MCEN, CHEN, GEEN or AMEN majors only.

Additional Information: Departmental Category: Environmental

CVEN 3424 (3) Water and Wastewater Treatment

Introduces design and operation of facilities for treatment of municipal water supplies and wastewater. Provides an engineering application of physical, chemical, and biological unit processes and operations for removal of impurities and pollutants. Involves an integrated design of whole treatment systems combining process elements.

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 3434 (3) Introduction to Applied Ecology

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3434

Requisites: Prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351; (all min C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Environmental (EVEN) or Architectural Engineering (AREN) mjrs.

Additional Information: Departmental Category: Environmental

CVEN 3525 (3) Structural Analysis

Studies structural analysis of statically determinate and indeterminate systems, deflections, energy methods, and force method.

Requisites: Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematic (AMEN) majors only.

Additional Information: Departmental Category: Structures

CVEN 3602 (3) Transportation Systems

Introduces technology, operating characteristics, and relative merits of highway, airway, waterway, railroad, pipeline, and convey or transportation systems. Focuses on evaluation of urban transportation systems and recent transportation innovations.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 3698 (3) Engineering Geology

Highlights the role of geology in engineering minerals; rocks; surficial deposits; rocks and soils as engineering materials; distribution of rocks at and below the surface; hydrologic influences; geologic exploration of engineering sites; geologic hazards; mapping; and geology of underground excavations, slopes, reservoirs and dam sites.

Requisites: Requires a prerequisite or corequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Geotechnical

CVEN 3708 (3) Geotechnical Engineering 1

Covers basic engineering characteristics of geological materials; soil and rock classifications; site investigation; physical, mechanical, and hydraulic properties of geologic materials; the effective stress principle; soil and rock improvement; seepage analysis; stress distribution; and consolidation and settlement analyses. Selected experimental and computational laboratories.

Requisites: Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematic (AMEN) majors only.

Additional Information: Departmental Category: Geotechnical

CVEN 3718 (3) Geotechnical Engineering 2

Covers stress analysis and plastic equilibrium, shear strength of soil, bearing capacity, lateral earth pressures, slope stability and underground construction. Analysis and design of shallow and deep foundations, retaining walls and other earth and rock structures. Selected experimental and computational laboratories.

Requisites: Requires prerequisite course of CVEN 3708 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Geotechnical

CVEN 3837 (1-3) Special Topics

Supervised study of special topics of interest to student under instructor guidance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 3930 (6) CEAE Cooperative Education

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program with a university, government agency, or industry. Offered only through Continuing Education and cannot be used to fulfill any of CEAE's degree requirements. 00 GPA or higher.

Repeatable: Repeatable for up to 24.00 total credit hours.

Requisites: At least a 2.75 cumulative GPA is required. Restricted to Civil (CVEN), Environmental (EVEN), or Architectural Engineering (AREN) majors only.

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Building Systems

CVEN 4147 (3) Civil Engineering Systems

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5147

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

CVEN 4161 (3) Mechanics of Materials 2

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5161

Requisites: Requires prerequisite course of CVEN 3161 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 4323 (3) Water Resource Engineering Design

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5423

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4333 (3) Engineering Hydrology

Studies engineering applications of principles of hydrology, including hydrologic cycle, rainfall and runoff, groundwater, storm frequency and duration studies, stream hydrography, flood frequency, and flood routing.

Requisites: Requires prerequisite course of CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 (all minimum grade C-). Requires prerequisite or corequisite course of CVEN 3227 or APPM 4570 or MCEN 3047 or MCEN 3208 or CHEN 3010.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4353 (3) Groundwater Engineering

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

Requisites: Requires prerequisite course of CVEN 3313 or MCEN 3021 or CHEN 3200 or GEEN 3853 (minimum grade C-).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4383 (3) Groundwater Modeling

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5383

Recommended: Prerequisite CVEN 4353.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4404 (3) Water Chemistry

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4404

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 and CVEN 3414 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Environmental

CVEN 4414 (1) Water Chemistry Laboratory

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from CVEN 4404 in laboratory experiments and reports.

Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4414

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 and CVEN 3414 (all minimum grade C-). Requires corequisite course of CVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

Additional Information: Departmental Category: Environmental

CVEN 4424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4424

Requisites: Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 2100 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4434 (4) Environmental Engineering Design

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4434

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5464 and EVEN 4464

Requisites: Requires prerequisite or corequisite courses of CVEN 3414 and CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 (all minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4474 (3) Hazardous and Industrial Waste Management

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5474

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Environmental

CVEN 4484 (3) Introduction to Environmental Microbiology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5484 and EVEN 4484

Requisites: Requires prerequisite courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351 and APPM 2350 or MATH 2400 (all minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4511 (3) Introduction to Finite Element Analysis

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5511

Requisites: Requires prerequisite courses of CVEN 3161, CVEN 3525, APPM 2360 or MATH 3130 and MATH 4430 (all minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 4525 (3) Matrix Structural Analysis

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5525

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4535 (1-3) Construction Materials

Introduces material science of engineering materials, such as atomic and crystal structures, defects and phase diagrams; discusses in detail three construction materials: steel, Portland cement concrete and asphalt concrete including classification and composition, engineering properties and testing methods (with three lab sessions). Covers basic of three materials: wood, fiber reinforced polymers and masonry.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Structures

CVEN 4537 (3) Numerical Methods in Civil Engineering

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5537

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: Miscellaneous

CVEN 4545 (3) Steel Design

Applies basic principles of structural engineering and mechanics to design of steel structures; design of tension members, columns, beams, open-web joists, steel decks, bolts, bolted connections, welding processes, and welded connections.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4554 (3) Fundamentals of Air Quality Management

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Elective for the EVEN air quality track or an environmental concentration course for CVEN.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5554

Requisites: Requires prerequisite courses of APPM 2360 or MATH 2130 and MATH 3430 and CVEN 3313 or CHEN 3200 or MCEN 3021 (all minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4555 (3) Reinforced Concrete Design

Applies basic principles of structural engineering and mechanics to the design of reinforced concrete structures, including design of beams, columns, slabs, and footings; continuous beams and frames; cast-in-place buildings.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4565 (3) Design of Wood Structures

Applies basic principles of structural engineering and mechanics to the design of wood structures, including the design and analysis of columns, trusses, beams and connections using dimensional lumber, glulam and cross-laminated timber.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4594 (3) Water Reuse and Reclamation

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5594

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 4718 (3) Mechanics and Dynamics of Glaciers

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5718

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 (all minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 4728 (3) Foundation Engineering

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5728

Requisites: Requires prerequisite course of CVEN 3718 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 4830 (1-4) Special Topics

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Building Systems

CVEN 4833 (1-3) Special Topics

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4834 (1-3) Special Topics

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Environmental

CVEN 4835 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Structures

CVEN 4837 (1-3) Special Topics

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

CVEN 4838 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Geotechnical

CVEN 4839 (3-6) Special Topics for Seniors

Offers a supervised study of special topics, under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 4849 (1-3) Independent Study

Involves an independent, in-depth study, research, or design in a selected area of civil or environmental engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 4878 (1-3) Independent Study

Involves an independent, in-depth study, research, or design in a selected area of civil or environmental engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

Additional Information: Departmental Category: Geotechnical

CVEN 4897 (2) Professional Issues in Civil Engineering

Educates students about the knowledge and skills required for professional civil engineers. Students learn about the path to a professional license, prepare for the FE exam, analyze a situation involving multiple conflicting ethical interests, identify aspects of sustainability in civil engineering projects, and understand the role of project management, public policy, business and public administration, and leadership in civil engineering.

Requisites: Restricted to students with 87-180 credits (Seniors) Civil (CVEN), Environmental (EVEN), or Architectural Engineering (AREN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 4899 (4) Civil Engineering Senior Project Design

Provides a simulated real world design and construction planning experience where teams integrate across multiple civil engineering sub-disciplines to create a solution that satisfies multiple constraints, including design, client requirements, budget, schedule, technical, regulatory, and societal. Final deliverables include: detailed design drawings, specifications, cost estimate, project schedule, construction plan, oral and written presentation.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) Civil (CVEN) or General (GEEN) engineering majors only.

Additional Information: Departmental Category: Special Topics

CVEN 5111 (3) Structural Dynamics

Focuses on the response of single- and multi-degree of freedom structures subjected to harmonic, impulsive and arbitrary loads (including earthquake base excitation). Sources and modeling of damping will be discussed. Analytical and numerical solutions will be considered for both linear and nonlinear structural systems. Elastic and inelastic response spectra will be discussed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5131 (3) Continuum Mechanics and Elasticity

Provides foundation for advanced study of structural, mechanical and geo-material behavior and continuum theories in mechanics. Topics: Cartesian tensors, formulation of continuum mechanics for small and large deformation, constitutive laws for elastic solids, energy principles, methods of potentials, formulations and solutions of 2D and 3D elastostatic and elastodynamic problems, analytical and numerical formulations.

Recommended: Prerequisite CVEN 4161.

Additional Information: Departmental Category: Mechanics

CVEN 5147 (3) Civil Engineering Systems

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4147

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 5161 (3) Advanced Mechanics of Materials I

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4161

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5206 (3) Design Development

Provides an overview of the development process and proforma, investigates the interrelationship between design decisions and building costs, and evaluates the impact of each major building system on the development budget and schedule. Provides a simulated development experience where students respond to a Request for Proposal, including proformas, design, estimates and outline specifications. Department consent required. Taught intermittently.

Additional Information: Departmental Category: Construction

CVEN 5216 (3) Applied Construction Financial Management

Teaches students to interpret commonly used financial reports in the construction engineering industry sector. Skills developed in this course will better prepare students to become competent consumers of financial information and influence future results the construction business. Models for financing public and private sector projects will also be explored. Taught intermittently.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5226 (3) Construction Safety

Comprehensively studies construction safety in the construction industry. Focuses on advanced safety management issues such as accident causation theory, economic modeling, safety risk quantification and analysis, design for safety, predictive analytics and learning. Skills developed in this course will prepare graduate students to be effective quality and safety managers or researchers.

Additional Information: Departmental Category: Construction

CVEN 5246 (3) Legal Aspects of Construction

Applies law in engineering practice; contracts, construction contract documents, construction specification writing, agency, partnership, and property; types of construction contracts; and legal responsibilities and ethical requirements of the professional engineer. Taught intermittently.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5276 (3) Engineering Risk and Decision Analysis

Acquaints students with the fundamental principles and techniques of risk and decision analysis. Oriented toward project-level decisions in which risk or uncertainty plays a central role. Introduces students to Monte Carlo analyses, and various types of multicriteria decision analyses. Culminates in a larger term project.

Recommended: Prerequisite CVEN 3227 and graduate standing or instructor consent required.

Additional Information: Departmental Category: Construction

CVEN 5286 (3) Design Construction Operations

Considers effective/efficient design of construction operations. Front end planning; construction labor relations; productivity management. Emphasizes construction productivity improvement by group field studies and discrete event simulation modeling. How overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment, human, and material resources.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5313 (3) Environmental Fluid Mechanics

Analysis of viscous incompressible flows, with first-principle solutions for environmental fluid flows in oceans, rivers, lakes and the atmosphere. Topics include the Navier-Stokes equations, kinematics, vorticity dynamics, geophysical fluid dynamics, and density stratification.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites APPM 2350 and APPM 2360 and CVEN 3313.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5323 (3) Applied Stream Ecology

Emphasizes the integration of hydrologic, chemical, and biological processes in controlling river, stream, and reservoir ecosystems at several spatial scales. Students apply ecosystem concepts to current environmental and water quality problems and learn field methods in field trips and a team project.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5333 (3) Physical Hydrology and Hydroclimatology

Introduces hydrology as a quantitative science describing the occurrence, distribution and movement of water at and near the surface of the earth. Develops a quantitative understanding of atmospheric water, infiltration, evapotranspiration and surface runoff. Studies global climatology and large scale climate drivers of regional hydrology at interannual time scales. Solves engineering problems related to water resources.

Requisites: Requires prerequisite courses of CVEN 5454 and CVEN 5537 (all minimum grade of C-). Restricted to graduate students only.

Recommended: Prerequisite CVEN 4333.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5343 (3) Transport and Dispersion in Surface Water

Studies transport and dispersion of introduced contaminants in turbulent surface water flows. Emphasizes developing a physical understanding of fluid processes responsible for turbulent dispersion. Includes analytical development, numerical modeling, and experimental approaches to the problem.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5346 (3) Managing Construction and Engineering Projects and Organizations

Explores organizational and managerial issues and concerns facing executives in engineering and construction organizations. Through readings, case studies, simulation exercises, and projects, students are introduced to and apply concepts of strategy, core competencies, vision, innovation, team dynamics, interpersonal influence, organizational design issues, and global projects to engineering and construction organizations.

Additional Information: Departmental Category: Construction

CVEN 5353 (3) Groundwater Hydrology

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 and APPM 2360.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5363 (3) Modeling of Hydrologic Systems

Introduces students to modeling techniques. Focus areas include physical hydrology and hydrometeorology; measurement and inference; climate change impacts; role of scale in hydrology; uncertainty analysis; and a case study project. Projects will examine hydrologic impacts of various drivers such as climate warming or land cover change, utilizing an assessment of historic conditions to better understand and model future disturbance scenarios.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5373 (3) Water Law, Policy, and Institutions

Discusses contemporary issues in water management based on legal doctrine. Identifies legal issues in water resources problems and discusses in close relationship with technical, economic, and political considerations.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5383 (3) Applied Groundwater Modeling

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4383

Recommended: Prerequisites APPM 2360 and CVEN 4353 or CVEN 5353.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5393 (3) Water Resources System and Management

Introduces water resources planning and management as an integrated systems problem that satisfies multiple competing objectives under constraints and uncertainty. Includes problem formulation and solution using decision support systems, optimization with and without uncertainty, stochastic simulation, and multiobjective optimization. Introduces water resources economics and planning under uncertainties such as climate change and increasing urbanization.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5404 (3) Water Chemistry

Introduces chemical fundamentals governing the chemistry of natural and treated waters. Topics include thermodynamics and kinetics of acid and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction, and sorption.

Requisites: Restricted to concurrent BS/MS (C-CVEN or C-EVENCVEN) or graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5414 (3) Water Chemistry Laboratory

Uses experimental and analytical laboratory techniques to develop a better understanding of the concepts of aquatic chemistry and to investigate water chemistry in treated and natural water systems. Techniques include titration, spectrophotometry, gas chromatography, other advanced instrumentation, sampling, portable analyses, and basic statistics and experimental design. Course focuses on water chemistry of Boulder Creek and other local waters.

Requisites: Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-). Requires corequisite course of CVEN 5424.

Additional Information: Departmental Category: Environmental

CVEN 5423 (3) Water Resources Engineering Design

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4323

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical processes that impact the fate and transport of organic contaminants in natural and engineered systems. Emphasizes both equilibrium and kinetic aspects, including solubility, vapor pressure, air-water exchange, sorption, abiotic redox reactions, and photodegradation.

Additional Information: Departmental Category: Environmental

CVEN 5434 (3) Environmental Engineering Design

Team-based design of facilities or processes for water or wastewater or solid waste treatment or remediation under multiple real-world constraints. Department consent required.

Recommended: Prerequisite CVEN 5524 or CVEN 5534 or CVEN 5474.

Additional Information: Departmental Category: Environmental

CVEN 5444 (3) Municipal Des Proj

Additional Information: Departmental Category: Environmental

CVEN 5454 (3) Statistical Methods for Natural and Engineered Systems

Applies traditional and modern probability and statistical methods to environmental, hydrological, climatological and engineering data analysis. Topics include: basic probability, data visualization, fitting univariate and multivariate distributions, Monte Carlo simulations, extreme value distributions, confidence intervals and hypothesis testing, nonparametric density estimators, linear regression, and Bayesian analysis. The data analysis tool, R, is used throughout the course.

Additional Information: Departmental Category: Environmental

CVEN 5464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4464 and EVEN 4464

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5474 (3) Hazardous and Industrial Waste Management

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4474

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5484 (3) Applied Microbiology and Toxicology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4484 and EVEN 4484

Additional Information: Departmental Category: Environmental

CVEN 5494 (3) Surface Water Quality Modeling

Examines the relationships among air, water, and landpollution, water quality, and beneficial uses. Using models, develops the ability to quantify and predict the impacts of pollutants in the aquatic environment, and to develop approaches to minimize unfavorable water quality conditions.

Department consent required.

Additional Information: Departmental Category: Environmental

CVEN 5511 (3) Introduction to Finite Element Analysis

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4511

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5514 (3) Bioremediation

Advanced study on biological processes used to treat toxic organic and inorganic compounds contained in contaminated water, air, and soil; design and evaluation of in situ toxic compound biotransformation; fundamentals of phytoremediation; critical reviews of current literature on bioremediation.

Recommended: Prerequisite CVEN 4484 or CVEN 5424 or CVEN 5484.

Additional Information: Departmental Category: Environmental

CVEN 5524 (3) Drinking Water Treatment

Provides advanced study on theory-of-treatment processes, including design and operation of municipal water supplies.

Recommended: Prerequisite CVEN 4464 or CVEN 5464 or graduate standing or instructor consent required.

Additional Information: Departmental Category: Environmental

CVEN 5525 (3) Matrix Structural Analysis

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4525

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5534 (3) Wastewater Treatment

Covers the processes used to treat municipal wastewater, focusing on biological processes. Includes: design of aerobic, anoxic, anaerobic and suspended growth technologies to remove and transform pollutants; design and assessment of treatment approaches that recover energy, nutrients and water from wastewater; application of fundamental concepts of aquatic chemistry, environmental microbiology and computational models.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 5404 and CVEN 5484 and CVEN 5464.

Additional Information: Departmental Category: Environmental

CVEN 5537 (3) Numerical Methods in Civil Engineering

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4537

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 5544 (3) Solid Waste Management and Resource Recovery

Covers the scope of the nonhazardous solid waste problem and regulations that drive its management; discussions of nonengineering factors that impact waste management and recycling; design of incinerators, composting facilities, and landfills used to treat and dispose of solid waste.

Recommended: Prerequisite CVEN 3414.

Additional Information: Departmental Category: Environmental

CVEN 5554 (3) Fundamentals of Air Quality Management

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Required for CVEN environmental engineering graduate students.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4554

Additional Information: Departmental Category: Environmental

CVEN 5555 (3) Structural Reliability

Explores principles and methods of structural reliability, and formulates bases for design to insure adequate safety and performance of elements and structural systems. Undergraduates may enroll with the permission of the instructor.

Requisites: Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5564 (3) Water Profession: Leadership & Communication

Develops and improves the skills and tools needed for graduate students and young professionals. Focusing on highly effective leaders; leadership with impact; effective communication tools; and communicating with teams, city councils, governing boards, and the public.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environmental

CVEN 5565 (3) Life-Cycle Engineering of Civil Infrastructure Systems

Philosophical and analytical issues for lifetime design and operation of civil systems. Optimization tradeoffs of construction, management, and sustainability. Utility of operation and service, including present-value economic analysis. Decision-making alternatives of safety and performance, including hazards consideration. Undergraduates may enroll with the permission of the instructor.

Recommended: Prerequisite CVEN 3227 or equivalent.

Additional Information: Departmental Category: Structures

CVEN 5574 (3) Water Utility Management: Current Issues and Future Challenges

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on management, leadership, communication and utility financial in the new water profession era. Undergraduate seniors may contact instructor for permission to enroll.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5575 (3) Advanced Topics in Steel Design

Covers steel structure design and analysis. Includes plate girders, moment connections for beams, design of multistory frames, and other topics determined by class interest. Undergraduate may enroll with permission of the instructor.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4545.

Additional Information: Departmental Category: Structures

CVEN 5584 (3) Water Profession: Financial and Management

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on financing water services, capital planning, rates, management planning, staffing and organization and critical thinking. Undergraduates may request instructor permission to enroll.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5585 (3) Advanced Topics in Reinforced Concrete Design

Covers design and analysis topics for prestressed concrete and/or reinforced concrete structures. Includes review of the current ACI design code, slabs, prestressed concrete, seismic design, folded plates and shells, finite element analysis, and other topics determined by class interest. Undergraduates may enroll with the permission of the instructor.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4555.

Additional Information: Departmental Category: Structures

CVEN 5594 (3) Water Reuse and Reclamation

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4594

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3141 and CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 5604 (3) UV Processes in Environmental and Engineered Systems

Provides a fundamental basis for design of UV processes in water and wastewater treatment. Includes principles of photochemistry and photobiology. Applications to disinfection of water and degradation of chemical compounds in the environment. Design of UV disinfection systems and reactors and advanced oxidation processes. Environmental UV-based decay of pollutants.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3414 and CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 5614 (3) Bioenergy & Bioresource Recovery

Introduces fundamental theories and applied technologies used in production and conversion of renewable biomass including waste materials into bioenergy and other value-added products. Conducts quantitative evaluations on conversion processes such as renewable biogas production, electricity generation, liquid fuels, metal and nutrients recovery and organic chemical production.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4484.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environmental

CVEN 5628 (3) Seepage and Slopes

Covers fundamental principles of seepage in soils under both saturated and unsaturated conditions and limit equilibrium solution to slope stability problems. The seepage effects on slope stability are analyzed in detail and both conventional slope stability method and the finite element technique are applied to solving the engineering problems.

Recommended: Prerequisites CVEN 3708 and CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5678 (3) Soil Improvement and Reinforcement

Provides students with principles and working knowledge of design and construction procedures in soil stabilization, retaining structures, geosynthetics, and soil reinforcement.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5688 (3) Environmental Geotechnics

Provides an understanding of the use of geotechnical concepts in the analysis and design of environmental systems. Focus is placed on the evaluation of waste containment facilities. Including relevant saturated, unsaturated, and multiphase flow mechanisms in cover and liner systems. Includes stability analyses for landfills and geosynthetic interface shear strength. Covers relevant aspects of mining geotechnics and remediation technologies of contaminated sites.

Additional Information: Departmental Category: Geotechnical

CVEN 5708 (3) Soil Mechanics

Offers an advanced course in soil mechanics. Coverage includes basic principles of continuum mechanics; elasticity, viscoelasticity, and plasticity theories applied to soils; effective stress principle; consolidation; shear strength; critical state concepts; and constitutive, numerical, and centrifuge modeling.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5718 (3) Mechanics and Dynamics of Glaciers

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4718

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5728 (3) Foundation Engineering

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4728

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5738 (3) Applied Geotechnical Analysis

Studies applications of limiting equilibrium and limit plasticity analysis methods to stability problems in geotechnical engineering, such as slopes, lateral earth pressures on retaining structures, and bearing capacities of foundations. Also includes elastic and consolidation analysis of deformations in soil structures.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5748 (3) Design of Earth Structures

Covers theory, design, and construction of earth embankments and waste facilities, including isolation systems. Uses published data, field exploration, and laboratory tests on soils and rock in investigating foundations and construction materials. Involves principles of compaction and settlement, permeability analysis, landslide recognition and control, use of composite clay, and liner systems.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5758 (3) Flow Processes in Soils

Examines fundamental principles of flow through porous media and related engineering problems. Topics include the saturated seepage theory and flow nets; the unsaturated flow theory; suction-saturation and saturation-hydraulic conductivity relationships; nonlinear finite strain consolidation and desiccation theory; laboratory and field testing methods for determining material characteristics; and numerical models for flow-related engineering problems.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5768 (3) Introduction to Rock Mechanics

Nature of rocks and rock masses; engineering properties rock and rock mass; rock mass classifications; planes of weakness; application of rock mechanics to design of rock slopes, underground excavations, and foundations.

Recommended: Prerequisites CVEN 3708 and CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5788 (3) Computational Modeling in Geotechnical Engineering

Introduces computational modeling for geotechnical engineering applications such as the Discrete Element Method (DEM) for granular materials, nonlinear Finite Element Analysis (FEA) of seepage, coupled soil elastoplastic consolidation, elastoplasticity models for soil and rock, and advanced computational methods for failure in soil and rock. Uses DEM, FEA, and other software programs for analysis.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5798 (3) Dynamics of Soils and Foundations

Covers fundamental characterization of soils, foundations and structures under general dynamic and earthquake loads. Principles of vibrations and wave propagation for 1D, 2D, 3D. In-situ and laboratory determination of dynamic soil properties; methods for site response analysis, foundation vibrations, dynamic soil-structure interaction and liquefaction problems.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5818 (3) Geotechnical Earthquake Engineering

Familiarizes students with the fundamentals of engineering seismology, soil and structural dynamics, and the modern practice of geotechnical earthquake engineering. Focuses on describing earthquake hazards and methods for seismic analysis and design.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 5798.

Additional Information: Departmental Category: Geotechnical

CVEN 5822 (3) Geographical Information Systems for Civil and Environmental Systems

Theory and use of geographical information systems in civil engineering, environmental studies, natural resources and other related disciplines. Topics include spatial data models, data capture, global positioning system, database linkage, use in design, analysis and implementation. Laboratory work includes applications of Arc-View and Arc-GIS software.

Additional Information: Departmental Category: Surveying and

Transportation

CVEN 5830 (3) Special Topics for Seniors/Grads

Department consent required.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Building Systems

CVEN 5831 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5833 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5834 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5835 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5836 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Construction

CVEN 5837 (3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Additional Information: Departmental Category: Miscellaneous

CVEN 5838 (3) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Geotechnical

CVEN 5849 (1-3) Independent Study

Available only through approval of graduate advisor. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 5919 (3) Sustainable Community Development 1

Focuses on the fundamental tools necessary to address sustainable community development projects in low-income communities (LICs). Topics include: human development, sustainable development, and presentation of an integrative and participatory framework for development projects in LICs. The framework consists of a combination of development and engineering project management tools. Framework is illustrated through case studies and student-driven team projects.

Requisites: Restricted to students with sub-plan of Engineering Developing Communities (EDC).

Additional Information: Departmental Category: Special Topics

CVEN 5929 (3) Sustainable Community Development 2

Covers the principles, practices and strategies of appropriate technology as part of an integrated and systems approach to community-based development. Course content areas include technical issues in development, environmental health and communicable disease, appropriate and sustainable technologies with hands-on workshops, and global cooperation in development.

Requisites: Requires prerequisite course of CVEN 5919 (minimum grade C-). Restricted to students with EDC Sub-Plan.

Additional Information: Departmental Category: Special Topics

CVEN 5939 (3) Sustainable Community Development Field Practicum

Provides a supervised in-field practicum experience in which the student applies theories and concepts learned in CVEN 5919 and CVEN 5929.

Requisites: Requires prerequisites courses of CVEN 5919 and CVEN 5929 (all minimum grade C-). Restricted to students with sub-plan of Engineering Developing Communities (EDC).

Additional Information: Departmental Category: Miscellaneous

CVEN 5969 (1-3) Water, Sanitation, and Hygiene

Studies the fundamentals behind effective hygiene and remediation processes and engineering solutions developed/developed for specific international problems. Approaches to hygiene, clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3424 and CVEN 3414.

Additional Information: Departmental Category: Environmental

CVEN 6161 (3) Advanced Mechanics of Materials 2

Fundamentals of continuum mechanics, finite deformations, Lagrangian finite strains, Cauchy and Piola Kirchoff stress tensors, plasticity and thermo-elasticity, elements of damage mechanics, elements of fracture mechanics, rheological and viscoelastic theories, and modern experimental techniques.

Recommended: Prerequisite CVEN 5161.

Additional Information: Departmental Category: Mechanics

CVEN 6323 (3) Urban Stormwater Infrastructure Systems

Evaluation and design of more sustainable urban stormwater infrastructure systems including street inlets, on-line and off-line surface storage and infiltration systems. Integrated design for major, minor, and micro storms to provide flood control and drainage as well as control of pollution from stormwater runoff. Simulation and optimization models will be used.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6333 (3) Introduction to Multi-Scale Variability and Scaling in Hydrology

Provides a foundational physical understanding of channel networks, runoff, precipitation, and evapotranspiration at multiple spatial scales of drainage basins using modern analytical concepts for understanding non-linear phenomena, e.g., fractals, multifractals, statistical scaling, criticality, and renormalization.

Requisites: Requires a prerequisite course of CVEN 5333 (minimum grade C-).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6383 (3) Flow and Transport through Porous Media

Studies basic physics of flow and transport of water, air, and other fluid mixtures through a porous medium. Course topics are relevant to applications in contaminant hydrology, contaminant transport in aquifers, hazardous waste management, geohydrology, soil physics, and geoenvironmental engineering.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6393 (1) Hydrologic Sciences and Water Resources Engineering Seminar

Provides a broad introduction to a variety of research topics from hydrologic sciences and water resources engineering. Offered as a one-hour weekly seminar by the departmental water faculty, graduate students, and external speakers.

Requisites: Restricted to graduate student Civil (CVEN) Engineering students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6414 (3) Aquatic Surfaces and Particles

Examines the role of surfaces and particles in the fate and transport of contaminants in the aquatic environment. Emphasizes modeling of absorption, dissolution, precipitation, surface-catalyzed reactions, and coagulation and filtration kinetics.

Requisites: Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 6511 (3) Nonlinear Finite Element Analysis of Solids and Porous Media

Covers constitutive modeling, multiphase mechanics, and finite element implementation of constitutive models and coupled solid-fluid mechanical governing equations for inelastic porous media at small strain. Considers transient and steady state conditions. Analyzes structural, geotechnical, geological, mechanical, biomechanical, and other related modern engineering problems. Uses general purpose finite element software program for implementation and analysis.

Additional Information: Departmental Category: Mechanics

CVEN 6525 (3) Nonlinear Analysis of Framed Structures

Explores theoretical underpinnings of nonlinear static and dynamic analysis of framed structures, along with exposure to the corresponding programming techniques in Matlab. Topics covered are: flexibility and fiber based beam-column element formulation; structural, section and fiber plasticity; geometric and material nonlinearities; nonlinear pushover and transient analysis of framed structures.

Requisites: Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 6595 (3) Earthquake Engineering

Analyzes and designs structures for earthquake load covering: properties of earthquake ground motions, ground motion prediction equations, seismic hazard analysis, response spectra, response of linear and nonlinear structures, construction of design spectra, seismic design methods, and building code requirements.

Requisites: Requires prerequisite course of CVEN 5111 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 6830 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Building Systems

CVEN 6831 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 6832 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6833 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6834 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Environmental

CVEN 6835 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Structures

CVEN 6836 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Construction

CVEN 6837 (3) Sp Tpcs Comp Graphics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miscellaneous

CVEN 6838 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Geotechnical

CVEN 6839 (1-3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 6943 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6944 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Environmental

CVEN 6945 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Structures

CVEN 6946 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Construction

CVEN 6947 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

CVEN 6948 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Geotechnical

CVEN 6949 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Special Topics

CVEN 6951 (1-4) Master's Thesis

Additional Information: Departmental Category: Mechanics

CVEN 6952 (1-4) Master's Thesis

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6953 (1-6) Master's Thesis

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6954 (1-6) Master's Thesis

Additional Information: Departmental Category: Environmental

CVEN 6955 (1-6) Master's Thesis

Additional Information: Departmental Category: Structures

CVEN 6956 (1-6) Master's Thesis

Additional Information: Departmental Category: Construction

CVEN 6957 (1-4) Master's Thesis

Additional Information: Departmental Category: Miscellaneous

CVEN 6958 (1-6) Master's Thesis

Additional Information: Departmental Category: Geotechnical

CVEN 6959 (1-4) Master's Thesis

Additional Information: Departmental Category: Special Topics

CVEN 6961 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Mechanics

CVEN 6962 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6963 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6964 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Environmental

CVEN 6965 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Structures

CVEN 6966 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Construction

CVEN 6967 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miscellaneous

CVEN 6968 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Geotechnical

CVEN 6969 (1-3) Masters Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 7111 (3) Advanced Structural Dynamics

Includes general vibrations of civil engineering structures and their response to various types of time-dependent loads.

Requisites: Requires prerequisite course of CVEN 5111 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 7141 (3) Plates and Shells

Teaches mathematical theories of plate and shell structures and their applications. Involves numerical finite element solutions of plates and shells of various shapes under static and dynamic loadings.

Requisites: Requires prerequisite courses of CVEN 5131 or CVEN 5161 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 7161 (3) Fracture Mechanics

Includes three parts: 1) fundamentals through rigorous mathematical formulations of linear/nonlinear elastic fracture mechanics, 2) materials' theoretical strength, including metals, granular materials, polymers and steel, 3) numerical (finite element) methods in fracture mechanics. Heavy emphasis on project and independent work.

Requisites: Requires prerequisite courses of CVEN 5511 and CVEN 6161 (all minimum grade of C-).

Additional Information: Departmental Category: Mechanics

CVEN 7206 (1) CEM PhD Seminar

Provides an overview of the research process and research methods in construction engineering and management. Students will study and evaluate different research methods and designs in an aim to prepare students to conduct and evaluate research. Taught intermittently.

Additional Information: Departmental Category: Construction

CVEN 7511 (3) Computational Finite Inelasticity and Multiphase Mechanics

Covers kinematics, thermodynamics, coupled balance equations and constitutive models, numerical time integration, and finite element implementation of finite strain inelasticity and multiphase mechanics. Kinematics of multiplicative decomposition, and finite strain mixture theory. Linearization for global nonlinear Newton-Raphson and solution algorithm of nonlinear constitutive models and coupled balance equations.

Recommended: Prerequisites CVEN 5131 and CVEN 5511 and CVEN 6511.

Additional Information: Departmental Category: Mechanics

CVEN 7718 (3) Engineering Properties of Soils

Emphasizes engineering aspects of soil mechanics. Implications of soil strength, volume change, consolidation behavior in engineering problems such as slope stability, deformation of retaining walls, surface subsidence due to tunneling. Time effects in soil/long-term bearing capacity of piles. Laboratory determination of constitutive parameters of soils. Field tests/their correlations with soil properties. Case studies using finite element software.

Requisites: Requires prerequisite course of CVEN 5708 (minimum grade of C-).

Additional Information: Departmental Category: Geotechnical

CVEN 7788 (3) Soil Behavior

Topics include soil mineralogy, formation of soils through sedimentary processes and weathering, determination of soil composition, soil water, colloidal phenomena in soils, fabric property relationships, analysis of mechanical behavior including compressibility, strength and deformation, and conduction phenomena in terms of physicochemical principles. Involves applications for stabilization and improvement of soils, and disposal of waste materials.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 7831 (1-3) Sp Tpc-Constitutive Mech

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Mechanics

CVEN 7838 (3) Special Topics

Additional Information: Departmental Category: Geotechnical

CVEN 7849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 8849 (3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 8991 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Mechanics

CVEN 8992 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Surveying and Transportation

CVEN 8993 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 8994 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Environmental

CVEN 8995 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Structures

CVEN 8996 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Construction

CVEN 8997 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Miscellaneous

CVEN 8998 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Geotechnical

CVEN 8999 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Special Topics

EVEN 1000 (1) Introduction to Environmental Engineering

Introduces first-year students to the environmental engineering program from an academic and a career perspective. Covers air quality, applied ecology, chemical processing, energy, engineering for developing communities, environmental remediation, and water resources and treatment. Includes reading and writing on the history of environmental engineering, major environmental issues, and professional ethics.

Requisites: Restricted to students with 0-60 units completed. Restricted to Environmental Engineering (EVEN) majors only.

EVEN 1001 (3) Environmental Engineering 101: An Introduction to Pollution Science

Surveys the science and engineering needed to understand the environmental and energy challenges which face urbanizing society: air and water pollution, climate change, and mining. Introduces how environmental engineers leverage basic science concepts to reduce pollution and optimize energy use. Analyzes how the mainstream media presents the environmental science of climate change and modern environmental disasters.

EVEN 2840 (1-3) Independent Study: General Topics

General topics relating to environmental engineering. One-on-one assistance with an instructor.

EVEN 3350 (3) Sustainability Principles for Engineers

An introduction to sustainability principles in the field of environmental engineering. Students will apply these principles to engineering problems in order to evaluate the environmental, economic and social implications of engineering and design decisions. Topics include definitions of sustainability, main engineering sustainability challenges (e.g., water, climate and materials), pollution generation and prevention and sustainability assessment tools.

Requisites: Requires a corequisite course of CVEN 3414. Restricted to Environmental Engineering (EVEN) majors only.

Grading Basis: Letter Grade

EVEN 4100 (3) Environmental Sampling and Analysis

Introduces students to techniques for characterization of surface water, subsurface water, soils and sediments, and air and planning of sampling and analysis efforts. Laboratories include stream sampling, drilling, monitoring well installation, water level, slug tests, air sampling.

Requisites: Requires prerequisite courses of CVEN 4404 and CVEN 4424 (all minimum grade C-). Restricted to Environmental Engineering (EVEN) majors only.

EVEN 4404 (3) Water Chemistry

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4404

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 and CVEN 3414 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

Grading Basis: Letter Grade

EVEN 4414 (1) Water Chemistry Laboratory

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from EVEN 4404 in laboratory experiments and reports.

Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4414

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires corequisite course of EVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

Grading Basis: Letter Grade

EVEN 4424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4424

Requisites: Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 1271 (minimum grade C-).

Grading Basis: Letter Grade

EVEN 4434 (4) Environmental Engineering Design

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4434

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-).

Grading Basis: Letter Grade

EVEN 4464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4464 and CVEN 5464

Requisites: Requires prerequisite courses of CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 and CVEN 3414 (all minimum grade C-).

Grading Basis: Letter Grade

EVEN 4484 (3) Introduction to Environmental Microbiology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4484

Requisites: Requires prerequisite course of CHEN 1211 (minimum grade C-).

Grading Basis: Letter Grade

EVEN 4830 (3) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

EVEN 4840 (1-3) Independent Study: General Topics

General topics relating to environmental engineering. One-on-one assistance with an instructor.

Repeatable: Repeatable for up to 6.00 total credit hours.

EVEN 4980 (3) Senior Thesis 1

Provides faculty-supervised independent research in environmental engineering for students planning to complete a senior thesis. To be taken prior to EVEN 4990, during the final year before graduation. Department consent required.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Environmental Engineering (EVEN) majors only.

EVEN 4990 (3) Senior Thesis 2

Continuation of EVEN 4980. Consists of final phase of faculty-supervised research, the preparation of a written thesis, and an oral defense of the research to

Requisites: Requires prerequisite course of EVEN 4980 (minimum grade C-).

EVEN 6940 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

EVEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

EVEN 8990 (1-10) Doctor's Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Architectural Engineering - Bachelor of Science (BS)

Architectural engineering has several common elements with civil, mechanical, and electrical engineering, but is specifically directed toward the building industry. It focuses on building systems, which include design of systems such as heating, ventilating and air conditioning (HVAC) systems; illumination and electrical systems; structural building

systems; and construction methods applied to buildings. The Bachelor of Science degree program is administered by the Department of Civil, Environmental and Architectural Engineering. Students also take courses in architectural history and architectural design from the Program in Environmental Design.

Educational Objectives

The educational objective of the architectural engineering program is for graduates to attain a broad knowledge and skills necessary to successfully begin and sustain a career, and to become leaders who advance the state-of-the art, in one of four core disciplines of the building industry:

- electrical and lighting systems
- heating, ventilating and air conditioning (HVAC) systems
- structural systems
- construction engineering and management

Educational Outcomes

The outcomes that students are expected to have attained upon graduation with the bachelor of science degree in architectural engineering are:

- the ability to apply knowledge of mathematics, science, and engineering
- the ability to design and conduct experiments
- the ability to analyze and interpret data
- the ability to design a system or component to meet desired needs
- the ability to function on multidisciplinary teams
- the ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibilities
- the ability to communicate effectively through writing and/or drawing
- the ability to communicate effectively through oral presentations
- an understanding of the impact of engineering on society
- an understanding of the necessity to engage in life-long learning
- a knowledge of contemporary issues in civil, environmental, and architectural engineering
- the ability to use modern engineering techniques, skills, and tools

Areas of Knowledge

The areas of knowledge that define these objectives include both technical and non-technical areas.

Technical areas are:

- elementary—the fundamentals for architectural engineering, including basic science and mathematics, building design, and construction processes; overview of building systems; elementary principles and processes of architecture; and laboratory measurement and data analysis;
- intermediate—introduction to building systems and their components, with corresponding analysis of electrical, HVAC and lighting systems as well as structural elements and components;
- proficiency—design, integration, and advanced analysis of electrical, HVAC, lighting, and structural systems; as well as the standards, codes, and recommended practices that govern these building systems; and

- specialization—advanced design, coupled with industry experience via internships, for building lighting and electrical system design, building HVAC systems design, building structural system design, and construction engineering and management.

Non-technical areas include:

- professional life, including methods of time and resource management, and professional ethics;
- processes and requirements of written and oral communication; and
- broad areas in the humanities and social sciences, including architectural history and language.

Concurrent Degree Program BS/MS in Architectural Engineering

A concurrent BS/MS degree program in architectural engineering (<http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate BS degree (including completed and in-progress courses). Once accepted into the program, students are allowed to count 6 credit hours taken at the graduate level for both the BS and MS degrees (if certain grade and GPA requirements are met); this allows a student to obtain both degrees in five to six years.

Requirements

The following information represents a nominal 8-semester sequence of study. Failure to complete the requirements listed below will postpone graduation. Any exceptions will require authorization from the CEAE Operations Committee and the Dean's Office. Students anticipating graduation within a year should meet with the architectural engineering undergraduate advisor at least one semester prior to their planned graduation to review their records. It is the student's responsibility to be certain that all degree requirements have been met, to apply for graduation online, and to keep the architectural engineering undergraduate advisor informed of any change in graduation plans.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
AREN 1316	Introduction to Architectural Engineering	1
CHEM 1221	Engineering General Chemistry Lab	1
CHEN 1211	General Chemistry for Engineers	4
CVEN 2012	Introduction to Geomatics	3
Humanities & Social Sciences Elective ¹		3
	Credit Hours	16

Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
AREN 1027	Engineering Drawing	3
PHYS 1110	General Physics 1	4
First-Year Projects course		3
	Credit Hours	14

Year Two		
Fall Semester		
AREN 2050	Building Materials and Systems	3
AREN 2110	Thermodyna	3
APPM 2350	Calculus 3 for Engineers	4
CVEN 2121	Analytical Mechanics 1	3
PHYS 1120	General Physics 2	4
	Credit Hours	17

Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
AREN 2120	Fluid Mechanics and Heat Transfer	3
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
CVEN 3161	Mechanics of Materials 1	3
CVEN 3246	Introduction to Construction	3
	Credit Hours	17

Year Three		
Fall Semester		
AREN 3010	Mechanical Systems for Buildings	3
AREN 3540	Illumination I	3
CVEN 3525	Structural Analysis	3
ECEN 3030	Electrical/Electronic Circuits Non-Major	3

Free elective		3
	Credit Hours	15
Spring Semester		
Proficiency I		3
Proficiency II		3
Concentration I		3
College-approved writing course ²		3
Technical elective		3
	Credit Hours	15
Year Four		
Fall Semester		
ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings	3
ARCH 4010	Architectural Appreciation and Design	5
Concentration II		3
Humanities & Social Sciences elective ¹		3
Technical elective		3
	Credit Hours	17
Spring Semester		
ENVD 3134	History and Theory of Environmental Design and the Medium Scale: Precincts	3
AREN 4317	Architectural Engineering Design	5
Humanities & Social Sciences elective ¹		3
Technical electives		6
	Credit Hours	17
	Total Credit Hours	128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Courses Available for Specialization

Students select two proficiency-level courses from different subdisciplines and two concentration-level courses from one subdiscipline. Upon consultation with their advisors, students are expected to select technical elective courses applicable to their areas of interest and specialization. The areas of specialization are construction engineering and management, mechanical systems, structural systems, and lighting and electrical systems.

In addition to the courses listed below, other courses not listed may be proposed by a student and approved by the advisor if they are found to be applicable.

Construction Engineering & Management

Proficiency

CVEN 3256 Construction Equipment and Methods 3

Concentration

AREN 4506 Pre-construction Estimating and Scheduling 3

AREN 4606 Construction Project Execution and Control 3

Mechanical Systems

Proficiency

AREN 4110 HVAC Design 3

Concentration

AREN 4890 Sustainable Building Design 3

AREN 5080 Computer Simulation of Building Energy Systems 3

Technical Electives

AREN 4010 HVAC System Modeling and Control 3

AREN 4990 Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts 3

AREN 5020 Building Energy Audits 3

Structural Systems

Proficiency

CVEN 4545 Steel Design 3

or CVEN 4555 Reinforced Concrete Design

Concentration

CVEN 4161 Mechanics of Materials 2 3

CVEN 4545 or CVEN 4555, whichever not used as proficiency 3

Technical Electives

AREN 4315 Design of Masonry Structures 3

CVEN 4525 Matrix Structural Analysis 3

CVEN 4565 Design of Wood Structures 3

Lighting & Electrical Systems

Proficiency

AREN 4550 Illumination 2 3

or AREN 4560 Luminous Radiative Transfer

or AREN 4570 Building Electrical Systems Design 1

Concentration

AREN 4550, AREN 4560, AREN 4570 - whichever two not used as proficiency 6

Technical Electives

AREN 4130 Optical Design for Illumination and Solid State Lighting 3

AREN 4530 Advanced Lighting Design 3

AREN 4540 Exterior Lighting Systems 3

AREN 4580 Daylighting 3

Civil Engineering - Bachelor of Science (BS)

The curriculum in civil engineering within the Department of Civil, Environmental and Architectural Engineering has been designed to prepare students for entry-level positions in professional practice or for graduate study in the following subdisciplines of civil engineering:

- construction engineering and management;
- environmental engineering;
- geotechnical engineering and geomechanics;

- structural engineering and structural mechanics; and
- water resource engineering and management.

For undergraduates who want additional preparation for graduate study and careers in research and development within civil engineering, a theoretically-based Engineering Science track is also available.

Educational Objectives

The program objectives for the bachelor of science degree in civil engineering are that within five years:

1. Graduates will be successfully employed in engineering, science, or technology careers
2. Graduates will be assuming management or leadership roles
3. Graduates will engage in continual learning by pursuing advanced degrees or additional educational opportunities through coursework, professional conferences and training, and/or participation in professional societies
4. Graduates will pursue professional registration or other appropriate certifications
5. Graduates will be engaged in activities that provide benefit to communities

Educational Outcomes

The outcomes that students are expected to have attained upon graduation with a bachelor of science degree in civil engineering are:

- the ability to apply knowledge of mathematics, science, and engineering
- the ability to design and conduct experiments
- the ability to analyze and interpret data
- the ability to design a system or component to meet desired needs
- the ability to function on multidisciplinary teams
- the ability to identify, formulate, and solve engineering problems
- an understanding of professional and ethical responsibilities
- the ability to communicate effectively through writing and/or drawing
- the ability to communicate effectively through oral presentations
- an understanding of the impact of engineering on society
- an understanding of the necessity to engage in life-long learning
- a knowledge of contemporary issues in civil, environmental, and architectural engineering
- the ability to use modern engineering techniques, skills, and tools
- the ability to explain basic concepts in management, business, public policy, and leadership

Before their graduation, students in civil and environmental engineering will take a capstone design course in addition to training in structural and foundation design, civil engineering systems, construction, engineering geology, engineering materials, geotechnical engineering, soil mechanics, water quality, environmental engineering, fluid mechanics, computer-aided and manual engineering drawing, mechanics and dynamics, computer modeling, professional practice and ethics seminars, structural analysis and design, surveying and transportation systems via required, and elective courses.

Concurrent Degree Program BS/MS in Civil Engineering

A concurrent BS/MS degree program in civil engineering (<http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate BS degree (including completed and in-progress courses). Once accepted into the program, students are allowed to count 6 credit hours taken at the graduate level for both the BS and MS degrees (if certain grade and GPA requirements are met); this allows a student to obtain both degrees in five to six years.

Dual Degree Program BS in Applied Mathematics and Civil Engineering

As an exceptional opportunity for talented students who are interested in analytical and computational methods related to civil engineering and general engineering science, the civil engineering and applied mathematics departments offer a streamlined track by which a student can earn a baccalaureate degree from both programs with a minimum of 15 extra credit hours. Consult the faculty program advisors in civil engineering and applied mathematics for information and admission.

Requirements

The following information represents a nominal 8-semester sequence of study. Failure to complete the requirements listed below will postpone graduation. Any exceptions will require authorization from the CEAE Operations Committee and the Dean's Office. Students anticipating graduation within a year should meet with the civil engineering undergraduate advisor at least one semester prior to their planned graduation to review their records. It is the student's responsibility to be certain that all degree requirements have been met, to apply for graduation online, and to keep the civil engineering undergraduate advisor informed of any change in graduation plans.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
CHEM 1221	Engineering General Chemistry Lab	1
CHEN 1211	General Chemistry for Engineers	4
CVEN 1317	Introduction to Civil and Environment Engineering	1
First-Year Engineering Projects course		3
Humanities & Social Sciences Elective ¹		3
		Credit Hours
		16
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4

AREN 1027	Engineering Drawing (or CVEN 1027)	3
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
PHYS 1110	General Physics 1	4
		Credit Hours 15

Year Two**Fall Semester**

APPM 2350	Calculus 3 for Engineers	4
CVEN 2012	Introduction to Geomatics	3
CVEN 2121	Analytical Mechanics 1	3
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
Humanities & Social Sciences elective ¹		3
		Credit Hours 18

Spring Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
AREN 2110	Thermodynamics	3
CVEN 3161	Mechanics of Materials 1	3
CVEN 3313	Theoretical Fluid Mechanics	3
CVEN 3698	Engineering Geology	3
		Credit Hours 16

Year Three**Fall Semester**

CVEN 3246	Introduction to Constructor	3
CVEN 3323	Hydraulic Engineering	3
CVEN 3414	Fundamentals of Environment Engineering	3
CVEN 3525	Structural Analysis	3
CVEN 3708	Geotechnical Engineering 1	3
		Credit Hours 15

Spring Semester

CVEN 3111	Analytical Mechanics 2	3
CVEN 3227	Probability, Statistics and Decision	3
CVEN Proficiency I		3
College-approved writing course ²		3
Humanities & Social Sciences elective ¹		3
		Credit Hours 15

Year Four**Fall Semester**

CVEN 4897	Professional Issues in Civil Engineering	2
CEAE technical electives		6
CVEN Proficiency II		3
Free elective		3
Humanities & Social Sciences elective ¹		3
		Credit Hours 17

Spring Semester

CVEN 4899	Civil Engineering Senior Project Design	4
CVEN Proficiency III		3
Humanities & Social Sciences elective ¹		3
Technical electives		6
		Credit Hours 16
		Total Credit Hours 128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Environmental Engineering - Bachelor of Science (BS)

Environmental engineers play a vital role in maintaining the quality of both public health and the natural environment. Environmental engineering encompasses the scientific assessment and development of engineering solutions to environmental problems impacting the biosphere, land, water, and air quality. Environmental issues affect almost all municipal, commercial, and industrial sectors, and are a central concern for the public, for all levels of government, and in international relations. These issues include safe drinking water, wastewater processing, solid and hazardous waste disposal, outdoor and indoor air pollution, human health and ecological risk management, prevention of pollution through alternative product or process design, and renewable and sustainable energy sources.

To address these challenges, environmental engineers often encounter challenging problems that must be solved in data-poor situations as

members of multidisciplinary teams. Environmental problems require creative solutions blended with contributions from scientists, lawyers, business people, and the public. Good communication skills, as well as technical proficiency, are essential for success in this arena. In addition, technology designed to address environmental problems is marketed globally, opening up increasing opportunities for international work in the environmental engineering field.

Mission

The mission of the Environmental Engineering Program (<http://www.colorado.edu/even>) is to provide a multidisciplinary undergraduate environmental engineering education that emphasizes mastery of principles and practices, inspires service for the global public good, endows a desire for lifelong learning, and prepares students for broad and dynamic career paths in environmental engineering.

Faculty

The faculty of the Environmental Engineering (EVEN) Program (<http://www.colorado.edu/even/people>) are drawn from the Departments of Civil, Environmental, and Architectural Engineering; Mechanical Engineering; Chemical and Biological Engineering; and Aerospace Engineering Sciences. The EVEN faculty, its Professional Advisory Board (representing prospective employers of its graduates), and EVEN alumni and current students have contributed to the creation of the program's mission and the educational objectives of the BS in environmental engineering degree.

Educational Objectives

The educational objective of the Environmental Engineering Bachelor of Science Degree is to produce graduates who are capable of reaching the following career goals three to five years after graduation:

1. Graduates will be employed in engineering, science, or other professional careers
2. Graduates will pursue professional registration or other appropriate certifications
3. Graduates will be engaged in continual learning by pursuing advanced degrees or additional educational opportunities through coursework, professional conferences and training, and/or participation in professional societies.
4. Graduates will be engaged in activities that provide benefits to communities, the environment, and/or public health

Program Outcomes

The outcomes that students are expected to have attained upon graduation with a bachelor of science degree in environmental engineering are:

1. The ability to apply knowledge of math, science, and engineering
2. The ability to design and conduct experiments
3. The ability to analyze and interpret data
4. The ability to design a system, component, or process to meet desired needs within realistic constraints
5. The ability to function on multidisciplinary teams
6. The ability to identify, formulate, and solve engineering problems
7. An understanding of professional and ethical responsibility
8. The ability to communicate effectively through writing
9. The ability to communicate effectively through oral presentations
10. An understanding of the impact of engineering on society

11. A recognition of the need for and an ability to engage in life-long learning
12. A knowledge of contemporary issues in environmental engineering
13. The ability to use modern engineering techniques, skills and tools

Concurrent Degree Program BS/MS in Environmental and Civil Engineering

A concurrent BS/MS degree program in environmental engineering (<http://www.colorado.edu/even/current-students/5-year-bsms>) is available. Students may apply to the program when they have completed 75–110 credit hours toward the undergraduate EVEN degree. Once accepted into the program, students may be allowed to count 6 credit hours taken at the graduate level for both the environmental engineering BS and the civil engineering MS degrees, thus allowing them to obtain both degrees in a five-year curriculum.

Requirements

The BS degree in environmental engineering at the University of Colorado Boulder provides preparation for professional proficiency or graduate training in environmental engineering in a four-year curriculum. The curriculum includes courses in engineering fundamentals and applications, advanced mathematics, chemistry, physics, microbiology and earth science, along with courses in the arts, humanities and social sciences.

Courses specific to environmental engineering practice include water chemistry, environmental microbiology, and air pollution control. In addition, environmental engineering requires hands-on laboratory experiences, up-to-date skills in the use of computers for modeling and data analysis, and experience in the design of environmental engineering systems. Many of the required engineering courses in the bachelor of science curriculum are culled from civil, environmental, and architectural engineering; chemical and biological engineering; and mechanical engineering.

The curriculum also includes three technical electives, three environmental engineering sequence courses, and one free elective. Technical elective courses include a broad range of science and engineering courses, and must include an earth sciences course.

The environmental engineering sequence courses are selected by the student beginning in the junior year. The sequence consists of one environmental engineering design course and two environmental engineering technical elective (<http://www.colorado.edu/even/technical-electives-suggestions>) courses.

Students in the program are also encouraged to participate in research through independent study or senior thesis projects, the Undergraduate Research Opportunities Program (UROP), or as undergraduate research assistants in sponsored research programs. Students are required to take the Fundamentals of Engineering (FE) exam when they are within 32 credit hours of graduation.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4

CHEM 1221	Engineering General Chemistry Lab	1	CVEN 4834	Special Topics (Sustainability Principles for Engineers) ³	3
CHEM 1211	General Chemistry for Engineers	4	CVEN 3414	Fundamentals of Environment Engineering	3
EVEN 1000	Introduction to Environment Engineering ³	1	Humanities and social science elective ⁴		3
First-Year Engineering Projects course		3		Credit Hours	16
Humanities and social science elective ⁴		3			
	Credit Hours	16			
Spring Semester					
APPM 1360	Calculus 2 for Engineers	4	Year Three		
CHEM 1310	Introduction to Engineering Computing	3	Fall Semester		
PHYS 1110	General Physics 1	4	EVEN 4404	Water Chemistry ³	3
Humanities and social science elective ⁴		3	EVEN 4414	Water Chemistry Laboratory ³	1
Technical elective ¹		3	Select one of the following in Engineering Economics:		3
	Credit Hours	17	CVEN 4147	Civil Engineering Systems	
Year Two					
Fall Semester					
APPM 2350	Calculus 3 for Engineers	4	EMEN 4100	Engineering Economics	
PHYS 1120	General Physics 2	4	BUSM 3002	Business and Financial Analytics (only for students earning a business minor)	
PHYS 1140	Experimental Physics 1	1	Select one of the following in Fluid Mechanics:		3
Select one of the following in Solid mechanics:		3	CHEN 3200	Chemical Engineering Fluid Mechanics	
CVEN 2121	Analytical Mechanics 1		CVEN 3313	Theoretical Fluid Mechanics	
GEEN 2851	Statics for Engineers		GEEN 3853	Fluid Mechanics for Engineers	
MCEN 2023	Statics and Structures		MCEN 3021	Fluid Mechanics	
Humanities and social science elective ⁴		3	Select one of the following in Thermodynamics:		3
	Credit Hours	15	AREN 2110	Thermodynamics	
Spring Semester					
APPM 2360	Introduction to Differential Equations with Linear Algebra	4	CHEN 3320	Chemical Engineering Thermodynamics	
CHEN 2120	Chemical Engineering Material and Energy Balances	3	GEEN 3852	Thermodynamics for Engineers	
			MCEN 3021	Fluid Mechanics	
			College-approved writing course ⁵		3
				Credit Hours	16
Spring Semester					
			EVEN 4424	Environmental Organic Chemistry ³	3

EVEN 4484	Introduction to Environment Microbiology ³	3
CHEN 3210 or MCEN 3022	Chemical Engineering Heat Transfer or Heat Transfer	3
Select one of the following in Probability and Statistics:		3
APPM 4570	Statistical Methods	
CHEN 3010	Applied Data Analysis	
CVEN 3227	Probability, Statistics and Decision	
Environmental engineering design/technical elective I ²		3
	Credit Hours	15

Year Four

Fall Semester

EVEN 4464	Environment Engineering Processes ³	3
Humanities and social science elective ⁴		3
Air or earth science laboratory or field course		3
Environmental engineering design/technical elective II ²		3
Select one of the following:		3
Technical elective II ¹		
Senior Thesis ⁶		
Environmental engineering design/technical elective III ²		
Free elective		2
	Credit Hours	17

Spring Semester

CVEN 4333	Engineering Hydrology ³	3
CVEN 4434	Environmental Engineering Design ³	4
MCEN 4131	Air Pollution Control Engineering ³	3
Select one of the following:		3
Environmental engineering design/technical elective III ²		
Technical Elective II ¹		
Select one of the following:		3
Technical elective III ¹		
Senior Thesis ⁶		
	Credit Hours	16
	Total Credit Hours	128

- ¹ A total of 9 credit hours of technical electives is required. Three technical elective credit hours may be lower-division (1000–2000-level). Three technical elective credit hours must be in the earth sciences, either lower or upper division. Remaining technical elective credit hours must be upper division in engineering, mathematics or sciences. Independent study (EVEN 4840) or senior thesis (EVEN 4980 and EVEN 4990) may be completed as technical electives for up to 6 credits hours.
- ² A nine-credit-hour (three-course) sequence in environmental engineering – one environmental engineering design course and two environmental engineering technical electives.
- ³ Only offered in the semester shown (not including summer offerings).
- ⁴ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).
- ⁵ Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).
- ⁶ A senior thesis can be completed on a single research topic, with faculty approval and direction, and can apply toward technical elective requirements.

Architectural Engineering - Minor

The undergraduate minor in architectural engineering serves CU Boulder students who are interested in building science, engineering and system designs. The minor is intended to expose students to basic building science knowledge, engineering and system concepts, and calculation and design skills.

Requirements

Admission

A cumulative GPA of 2.750 or higher is required to be admitted to the minor.

The minor is not open to students pursuing the Bachelor of Science in architectural engineering or the Bachelor of Science in engineering plus with an architectural engineering disciplinary emphasis. In addition, the structural systems and construction engineering and management tracks (shown below) are not open to students pursuing the Bachelor of Science in civil engineering or the Bachelor of Science in engineering plus with a civil engineering disciplinary emphasis.

Prerequisites

The following prerequisite courses are required, with a grade of C- or higher in each. A student may be accepted into the minor with no more than two of these courses as deficiencies. All deficiencies must be completed before the minor is awarded.

- Calculus 1 (APPM 1350 or MATH 1300)
- Calculus 2 (APPM 1360 or MATH 2300)
- Calculus 3 (APPM 2350 or MATH 2400)
- Differential Equations and Linear Algebra (APPM 2360 or MATH 3130 + MATH 3430)
- Two semesters of calculus-based physics (PHYS 1110 and PHYS 1120)
- Statics (CVEN 2121, ASEN 2001, GEEN 2851, or MCEN 2023)

Grade Requirements

A cumulative GPA of 2.250 is required in the courses used to satisfy the minor requirements, with no individual grade lower than C-.

Residency

The minor requires 18 credit hours, at least nine of which must be AREN/CVEN courses completed on the CU Boulder campus. This is composed of three required courses: two courses in a single track plus one elective course.

Course Requirements

Required Core Courses

AREN 2050	Building Materials and Systems	3
CVEN 3246	Introduction to Construction	3
CVEN 3161	Mechanics of Materials 1	3
or MCEN 2063	Mechanics of Solids	

Tracks (Choose one) 6

Mechanical Systems Track

AREN 3010	Mechanical Systems for Buildings
AREN 4110	HVAC Design

Structural Systems Track ¹

CVEN 3525	Structural Analysis
CVEN 4545	Steel Design
or CVEN 4555	Reinforced Concrete Design

Electrical Systems Track

ECEN 3030	Electrical/Electronic Circuits Non-Major
or ECEN 2250	Introduction to Circuits and Electronics
or ECEN 3010	Circuits and Electronics for Mechanical Engineers
AREN 4570	Building Electrical Systems Design 1

Lighting Track

AREN 3540	Illumination I
AREN 4550	Illumination 2

Construction Engineering & Management Track ¹

AREN 4506	Pre-construction Estimating and Scheduling
AREN 4606	Construction Project Execution and Control

Elective 3

AREN 1027	Engineering Drawing
AREN 4010	HVAC System Modeling and Control
AREN 4130	Optical Design for Illumination and Solid State Lighting
AREN 4315	Design of Masonry Structures
AREN 4530	Advanced Lighting Design
AREN 4560	Luminous Radiative Transfer
AREN 4580	Daylighting
AREN 4830	Special Topics for Seniors/Grads (Sustainable Lighting Workshop, Computer Simulation of Building Systems, or Forensic Engineering)
AREN 4890	Sustainable Building Design
AREN 4990	Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts
AREN 5020	Building Energy Audits
AREN 5050	Advanced Solar Design
AREN 5070	Thermal Analysis of Buildings
CVEN 4565	Design of Wood Structures

CVEN 5830	Special Topics for Seniors/Grads (Distributed Generation Systems, Color Theory/Light Source, or Applied Data Analysis & Modeling)	
ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings	
ENVD 3134	History and Theory of Environmental Design and the Medium Scale: Precincts	
Total Credit Hours		18

¹ Not open to students pursuing the Bachelor of Science in civil engineering or the Bachelor of Science in engineering plus with a civil engineering disciplinary emphasis.

Civil Engineering - Minor

The undergraduate minor in civil engineering (CVEN) serves CU Boulder students interested in an introductory exposure to the broad discipline of civil engineering. The minor is intended to expose students to five sub-disciplines of civil engineering. The minor is not open to CVEN majors, or Engineering Plus majors with a CVEN emphasis.

Requirements

Admission

A cumulative GPA of 2.750 or higher is required to be admitted to the minor. See the CVEN undergraduate academic advisor, Christina Vallejos (christina.vallejos@colorado.edu), in ECOT 447 for additional admissions details.

Prerequisites

The following prerequisite courses are required, with a grade of C- or higher in each. A student may be accepted into the minor with no more than two of these courses as deficiencies. All deficiencies must be completed before the minor is awarded.

- Calculus 1 (APPM 1350 or MATH 1300)
- Calculus 2 (APPM 1360 or MATH 2300)
- Calculus 3 (APPM 2350 or MATH 2400)
- Differential Equations and Linear Algebra (APPM 2360 or MATH 2130 + MATH 3430)
- Two semesters of calculus-based physics (PHYS 1110 and PHYS 1120)
- Statics (CVEN 2121, ASEN 2001, GEEN 2851, or MCEN 2023)
- Fluid Mechanics (CVEN 3313, AREN 2120, MCEN 3021, GEEN 3853)
- Mechanics of Materials (CVEN 3161, MCEN 2063)

Residency

18 credits are required for the minor, at least 9 of which must be CVEN courses completed at the CU-Boulder campus.

Minimum Grades

Overall GPA of 2.25 in courses used toward the minor must be maintained, with no individual grade lower than C-.

Required Courses and Semester Credit Hours

Required Core Courses

CVEN 3246	Introduction to Construction	3
CVEN 3323	Hydraulic Engineering	3
CVEN 3414	Fundamentals of Environmental Engineering	3

CVEN 3525	Structural Analysis	3
CVEN 3708	Geotechnical Engineering 1	3
<i>One additional proficiency or advanced course in one of the following sub-disciplines:</i>		3
Construction Engineering and Management		
CVEN 3256	Construction Equipment and Methods	
AREN 4506	Pre-construction Estimating and Scheduling	
Environmental Engineering		
CVEN 3424	Water and Wastewater Treatment	
CVEN 4404	Water Chemistry	
CVEN 3434	Introduction to Applied Ecology	
CVEN 4474	Hazardous and Industrial Waste Management	
CVEN 4484	Introduction to Environmental Microbiology	
Geotechnical Engineering		
CVEN 3718	Geotechnical Engineering 2	
Structural Engineering		
CVEN 4545	Steel Design	
CVEN 4555	Reinforced Concrete Design	
Water Resource Engineering		
CVEN 4333	Engineering Hydrology	
CVEN 4353	Groundwater Engineering	
Civil Systems		
CVEN 4147	Civil Engineering Systems	
Total Credit Hours		18

Computer Science

Computer science offers study in the fields of computer architecture, operating systems, networking, mobile computing, computer security, robotics, algorithm design, artificial intelligence, software and web engineering, programming languages, database design and data mining, human–computer interaction, computer-supported cooperative work, machine learning, lifelong learning and design, numerical and parallel computation, speech and language processing, scientific computing and theoretical computer science.

Graduates typically take positions as software engineers for computer manufacturers or software firms, advanced applications programmers in scientific research firms or technically oriented usability experts or systems designers in commercial or government settings.

Computer science is an exciting and challenging field that has impact on many parts of our lives. Computer scientists craft the technologies that enable the digital devices we use every day. They develop the large-scale software that powers business and industry, and advance the computational techniques, and write the software that supports scientists in their study of the world around us. Many new applications of computing technology remain to be discovered. Indeed, computing will be at the heart of future revolutions in business, science and society. Students who study computer science now will be at the forefront of those important advances.

Computer science is concerned with how computers are constructed, how they store and process data, how they are used in problem-solving and how the quality of those solutions is assessed. It is about the science of creating software for a variety of users. It is about understanding how that software interacts with the hardware on which it is run and goes well beyond the machine to the study of how people

interact with the technologies around them. Applications of computer science reach far and wide.

For more information, visit the Department of Computer Science (<http://www.colorado.edu/cs>) website.

Course code for this program is CSCI.

Career Possibilities

Computer science graduates from CU Boulder are engaged in a wide variety of jobs with many different companies in locations all over the world. They produce the software and systems that touch lives every day in fields that include scientific exploration, communication, finance, publishing and research. Many are software developers, but others become teachers, writers, doctors, lawyers, scientists, military leaders and entrepreneurs. They work at some of the largest, most influential companies in the world, at research institutions, nonprofits and at the smallest start-ups of every type imaginable. And many lead highly successful companies that they themselves have founded.

Facilities, Programs and Opportunities

The Department of Computer Science utilizes a modern computing infrastructure that supports its research and educational missions. This includes general purpose computing labs provided by the university, additional instructional labs and administrative computing resources provided by the department, and specialized labs dedicated to the work of individual research groups. A wide variety of computing resources are available so that students have the opportunity to learn about and use cutting-edge equipment and software. The university research computing service maintains a supercomputer, high-speed networking and advanced computing infrastructure for the campus. While not required, the computer science educational culture emphasizes the use of individual laptop computers, including their use in courses and group work.

There are many networking opportunities available with companies offering paid internships. Boulder's tech start-up community, national research labs and traditional tech companies such as Google, IBM, Oracle and Microsoft, gives students with computer science skills many employment opportunities while earning their degrees. There are also extensive opportunities for undergraduate students to participate in research projects across the campus.

Bachelor's Degree

- Computer Science - Bachelor of Science (BS) (p. 689)

Minor

- Computer Science - Minor (p. 691)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Kenneth M (https://experts.colorado.edu/display/fisid_113566)

Professor; PhD, University of California-Irvine

Bennett, John Knox (https://experts.colorado.edu/display/fisid_116933)
Professor; PhD, University of Washington

Black, John (https://experts.colorado.edu/display/fisid_126540)
Associate Professor; PhD, University of California-Davis

Boese, Elizabeth Sugar (https://experts.colorado.edu/display/fisid_154230)
Instructor; MS, Colorado State University

Bradley, Elizabeth (https://experts.colorado.edu/display/fisid_100546)
Professor; PhD, Massachusetts Institute of Technology

Brown, Timothy X (https://experts.colorado.edu/display/fisid_107534)
Professor; PhD, California Institute of Technology

Brubaker, Jed Richards (https://experts.colorado.edu/display/fisid_156193)
Assistant Professor; PhD, University of California-Irvine

Byrd, Richard H.
Professor Emeritus; PhD, Rice University

Cai, Xiao-Chuan (https://experts.colorado.edu/display/fisid_100636)
Professor; PhD, New York University

Cerny, Pavol (https://experts.colorado.edu/display/fisid_151749)
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan (https://experts.colorado.edu/display/fisid_146087)
Assistant Professor; PhD, University of California-Berkeley

Chen, Lijun (https://experts.colorado.edu/display/fisid_149472)
Assistant Professor; PhD, California Institute of Technology

Clauzet, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Colunga, Eliana (https://experts.colorado.edu/display/fisid_129477)
Associate Professor; PhD, Indiana University Bloomington

Correll, Nicolaus J (https://experts.colorado.edu/display/fisid_147555)
Assistant Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Dowell-Deen, Robin DeAnne (https://experts.colorado.edu/display/fisid_147779)
Assistant Professor; DSc, Washington University

Ehrenfeucht, Andrzej
Professor Emeritus

Eisenberg, Michael A (https://experts.colorado.edu/display/fisid_100427)
Professor; PhD, Massachusetts Institute of Technology

Ellis, Clarence A.
Professor Emeritus

Fischer, Gerhard
Professor Emeritus; PhD, University of Hamburg

Fosdick, Lloyd D.
Professor Emeritus

Frew, Eric W (https://experts.colorado.edu/display/fisid_134685)
Associate Professor; PhD, Stanford University

Frongillo, Rafael M (https://experts.colorado.edu/display/fisid_156416)
Assistant Professor; PhD, University of California-Berkeley

Gabow, Harold
Professor Emeritus; PhD, Stanford University

Gross, Mark D (https://experts.colorado.edu/display/fisid_100095)
Professor; PhD, Massachusetts Institute of Technology

Grunwald, Dirk C (https://experts.colorado.edu/display/fisid_102261)
Professor; PhD, University of Illinois at Urbana-Champaign

Ha, Sangtae (https://experts.colorado.edu/display/fisid_153246)
Assistant Professor; PhD, North Carolina State University at Raleigh

Hall, David Matthew (https://experts.colorado.edu/display/fisid_147474)
Asst Research Professor

Hammer, Matthew A (https://experts.colorado.edu/display/fisid_156066)
Assistant Professor; PhD, University of Chicago

Han, Richard Yehwei (https://experts.colorado.edu/display/fisid_122947)
Associate Professor; PhD, University of California-Berkeley

Hoenigman, Rhonda Olcott (https://experts.colorado.edu/display/fisid_152997)
Instructor; PhD, University of Colorado Boulder

Hunter, Lawrence E (https://experts.colorado.edu/display/fisid_143568)
Professor

Jansen, Kenneth E (https://experts.colorado.edu/display/fisid_147360)
Professor; PhD, Stanford University

Jessup, Elizabeth R (https://experts.colorado.edu/display/fisid_102065)
Professor; PhD, Yale University

Kallen-Brown, Jedediah A (https://experts.colorado.edu/display/fisid_153965)
Assistant Professor; DSc, ETH Zurich (Switzerland)

Kane, Shaun Kevin (https://experts.colorado.edu/display/fisid_154603)
Assistant Professor; PhD, University of Washington

Keegan, Brian (https://experts.colorado.edu/display/fisid_158122)
Assistant Professor; PhD, Northwestern University

Keller, Eric Robert (https://experts.colorado.edu/display/fisid_151647)
Assistant Professor; PhD, Princeton University

Ketelsen, Christian W (https://experts.colorado.edu/display/fisid_147863)
Instructor; PhD, University of Colorado Boulder

King, Roger A.
Professor Emeritus

Knox, David Allen (https://experts.colorado.edu/display/fisid_158054)
Instructor; PhD, University of Colorado Health Sciences Center

Lewis, Clayton H (https://experts.colorado.edu/display/fisid_100307)
Professor; PhD, University of Michigan Ann Arbor

Lv, Qin (https://experts.colorado.edu/display/fisid_145832)
Associate Professor; PhD, Princeton University

Main, Michael G.
Professor Emeritus; PhD, Washington State University

Martin, James H (https://experts.colorado.edu/display/fisid_100495)
Professor; PhD, University of California-Berkeley

McBryan, Oliver
Professor Emeritus

Mishra, Shivakant (https://experts.colorado.edu/display/fisid_118376)
Professor; PhD, University of Arizona

Mozer, Michael C (https://experts.colorado.edu/display/fisid_105922)
Professor; PhD, University of California-San Diego

Nutt, Gary J.
Professor Emeritus

Palen, Leysia A (https://experts.colorado.edu/display/fisid_114604)
Professor; PhD, University of California-Irvine

Palmer, Martha (https://experts.colorado.edu/display/fisid_138162)
Professor; PhD, Univ of Edinburgh (Scotland)

Paul, Michael J (https://experts.colorado.edu/display/fisid_156070)
Assistant Professor; PhD, Johns Hopkins University

Repenning, Alexander (https://experts.colorado.edu/display/fisid_104946)
Research Professor; PhD, University of Colorado Boulder

Sanders, Bruce W.
Professor Emeritus

Sankaranarayanan, Sriram (https://experts.colorado.edu/display/fisid_147413)
Associate Professor; PhD, Stanford University

Schnabel, Robert B.
Professor Emeritus

Schreuder, Willem A (https://experts.colorado.edu/display/fisid_143834)
Asst Professor Adjunct

Shapiro, Ryan Benjamin (https://experts.colorado.edu/display/fisid_156418)
Assistant Professor; PhD, Northwestern University

Sibley, Gabriel T (https://experts.colorado.edu/display/fisid_154632)
Assistant Professor; PhD, University of Southern California

Sicker, Douglas C. (https://experts.colorado.edu/display/fisid_123114)
Professor; PhD, University of Pittsburgh

Sumner, Tammy R (https://experts.colorado.edu/display/fisid_105742)
Professor; PhD, University of Colorado Boulder

Szafir, Daniel James (https://experts.colorado.edu/display/fisid_156420)
Assistant Professor; PhD, University of Wisconsin-Madison

Szafir, Danielle N (https://experts.colorado.edu/display/fisid_156317)
Assistant Professor; PhD, University of Wisconsin-Madison

Tufo, Henry (https://experts.colorado.edu/display/fisid_127040)
Research Professor; PhD, Brown University

Voida, Amy Kathryn Mitchell (https://experts.colorado.edu/display/fisid_155855)
Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A (https://experts.colorado.edu/display/fisid_155856)
Assistant Professor; PhD, Georgia Institute of Technology

Waite, William M.
Professor Emeritus

Ward, Wayne Hinson (https://experts.colorado.edu/display/fisid_114680)
Research Professor; PhD, University of Colorado Boulder

Winklmann, Karl A.
Professor Emeritus

Wustrow, Eric A. (https://experts.colorado.edu/display/fisid_156419)
Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Pei Hsiu (https://experts.colorado.edu/display/fisid_151584)
Assistant Professor; PhD, Massachusetts Institute of Technology

Ying, Jordan Boyd-Graber (https://experts.colorado.edu/display/fisid_154406)
Assistant Professor; PhD, Princeton University

Courses

CSCI 1000 (1) Computer Science as a Field of Work and Study

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience.

Requisites: Restricted to students with 0-26 credits (Freshmen) Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA or CSCI-ADL) majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 1200 (3) The Art of Computational Thinking and Computer Programming

Teaches computational thinking and techniques for writing computer programs using the Python programming language. Intended for students who realize that obtaining computational skills is beneficial to all fields of study, but who have little or no experience in programming or are not Computer Science majors. Students will be expected to create computer programs to solve problems in a range of disciplines.

Additional Information: Departmental Category: General Computer Science

CSCI 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an on-line virtual world called Second Life as the "Laboratory" for the course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the student to important ideas and concepts that shape the field of computer science.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 1220

Additional Information: Departmental Category: General Computer Science

CSCI 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather on the way in which computing has affected human culture and thought in the past half century.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 1240

Additional Information: Departmental Category: General Computer Science

CSCI 1300 (4) Computer Science 1: Starting Computing

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Intended for students with little to no experience in computing or programming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1310 or CSCI 1320 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 1310 (4) Computer Science 1: Starting Computing - Experienced

Intended for students with some prior experience in programming and basic knowledge of variables, conditionals, and loops. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1320 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 1320 (4) Computer Science 1: Starting Computing-Engineering Applications

Intended for students with no prior experience in programming. Class outcomes and goals are identical to CSCI 1300, but uses problems and tools from Engineering. Teaching techniques for writing computer programs in higher level programming languages to solve problems of interest in Engineering and other domains.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1310 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Restricted to College of Engineering or Pre-Engineering Arts and Science (PREN) majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 2270 (4) Computer Science 2: Data Structures

Studies data abstractions (e.g., stacks, queues, lists, trees) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

Requisites: Requires prerequisite courses of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1030 or ECEN 1310 and APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2400 (4) Computer Systems

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

Requisites: Requires prerequisite course of CSCI 2270 and a prerequisite or corequisite course of CSCI 2824 or ECEN 2703 or a prerequisite course of MATH 2001 or APPM 3170 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2820 (3) Linear Algebra with Computer Science Applications

Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2824 (3) Discrete Structures

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

Requisites: Requires prerequisite courses of CSCI 1200 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1030 or ECEN 1310 and APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 2830 (1-3) Special Topics in Computer Science

Covers topics of interest in computer science at the sophomore level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Computer Science

CSCI 2900 (1-3) Lower Division, Undergraduate Level Independent Study

Offers selected topics at the elementary level for students with little or no previous computing experience.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Computer Science

CSCI 3002 (3) HCC Foundations/User-Centered Design and Development 1

Introduces the practice and research of human-centered computing, including the evolution of human-computer interaction to its forms today and the techniques of user-centered design. Surveys topics that include social computing; tangible computing; mobility; and more. It will cover computing in society at large with respect to domains such as health, education, assistive technology, emergency response and environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3010 (3) Programming Project Workshop

A semester-long projects course guided by an instructor to help design and develop a programming project.

Requisites: Requires a prerequisite course of CSCI 2270 (minimum grade C-).

CSCI 3022 (3) Introduction to Data Science Algorithms

Introduces students to the tools methods and theory behind extracting insights from data using computer science algorithms. Covers algorithms that maximize likelihood objective functions; linear prediction algorithms; making decisions based on data assembled from large datasets; discovering and quantifying connections between observations in real-world data such as text and images; representing and manipulating data on a computer.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3100 (1) Software and Society

Provides students with an understanding of the professional, ethical, legal and social issues and responsibilities of software developers, as well as providing them with the ability to analyze the local and global impacts of computing on individuals, organizations and society.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4308 and CSCI 4328 and CSCI 4338 and CSCI 4348

Requisites: Requires prerequisite course of CSCI 3308 (minimum grade C-). Restricted to Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA, CSCI-ADL) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Computer Science

CSCI 3104 (4) Algorithms

Covers advanced data structures, computational geometry, cryptography, dynamic programming, greedy algorithms, divide-and-conquer, graph algorithms (e.g., depth-first search), network algorithms (e.g., shortest paths), approximation algorithms.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 and one of the following: CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 3112 (1-3) Human-Centered Computing Professional Development

Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 3112

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3155 (4) Principles of Programming Languages

Study fundamental concepts on which programming of languages are based, and execution models supporting them. Topics include values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Programming Languages

CSCI 3202 (3) Introduction to Artificial Intelligence

Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170 and one of the following: APPM 3570, 4570, 4520, CSCI 3022, MATH 3510, 4510, CVEN 3227, ECEN 3810, MCEN 4120 or ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3287 (3) Design and Analysis of Data Systems

Analyzes design of data systems, including data stored in file systems, database management systems and physical data organizations. Studies calculus of data models, query languages, concurrency and data privacy and security.

Requisites: Requires prerequisite course of CSCI 3104 (minimum grade C-).

Additional Information: Departmental Category: Database Systems

CSCI 3302 (3) Introduction to Robotics

Introduces students to fundamental concepts in autonomous, mobile robotics: mechanisms, locomotion, kinematics, control, perception and planning. The course consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3303

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3308 (3) Software Development Methods and Tools

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 3434 (3) Theory of Computation

Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions.

Requisites: Requires prerequisite courses of CSCI 3104 and CSCI 3155 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 3656 (3) Numerical Computation

Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Topics include floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration.

Requisites: Requires prerequisite courses of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 1360 or MATH 2300 and MATH 2130 or APPM 2360 or APPM 3310 or CSCI 2820 (all minimum grade C-).

Additional Information: Departmental Category: Numerical Computation

CSCI 3702 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3753 (4) Design and Analysis of Operating Systems

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

Requisites: Requires prerequisite courses of CSCI 2270 and either CSCI 2400 or ECEN 3350 (all minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 3832 (3) Machine Translation

Provides a comprehensive overview of current techniques in statistical machine translation of natural language, e., automatically translating from Spanish to English. Covers language models, reordering, hierarchical translation and evaluating whether a translation is effective.

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4229 (3) Computer Graphics

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5229

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Graphics

CSCI 4239 (3) Advanced Computer Graphics

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5239

Requisites: Requires prerequisite course of CSCI 4229 (minimum grade C-).

Additional Information: Departmental Category: Graphics

CSCI 4250 (3) Computer Science: The Canon

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count as CS credit for the Computer Science BA, BS or minor.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5250

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Computer Science

CSCI 4253 (3) Datacenter Scale Computing - Methods, Systems and Techniques

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5253

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CSCI 4273.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4273 (3) Network Systems

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5273 and ECEN 5273

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4302 (3) Advanced Robotics

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5302

Requisites: Requires prerequisite course of CSCI 3302 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4308 (4) Software Engineering Project 1

Advanced practicum in which students design, implement, document and test software systems for use in industry, non-profits, government and research institutions. Also offers extensive experience in oral and written communication throughout the development process. Department enforced prerequisite: successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 4448.

Additional Information: Departmental Category: Software Engineering

CSCI 4314 (3) Algorithms for Molecular Biology

Surveys molecular biology and combinatorial algorithms used to understand DNA, RNA and proteins. Students work in groups to define and tackle meaningful biological problems and learn to collaborate effectively with scientists in other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5314

Requisites: Requires a prerequisite course of CSCI 3104 (minimum grade C-).

Recommended: Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

Additional Information: Departmental Category: Theory of Computation

CSCI 4318 (4) Software Engineering Project 2

Second semester of an advanced practicum in computer science. Students must take this course and CSCI 4308 contiguously as the project spans the entire academic year.

Requisites: Requires prerequisite course of CSCI 4308 (minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 4328 (4) Software Project Management and Mentoring

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing and prototype goals. Study project risk management and cost estimation approaches. Experience mentoring Senior Software Project Team. Intended for professional software developers. Department consent required, see Senior Project Director for permission.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Software Engineering

CSCI 4338 (2) Software Project Management

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing, and prototype goals. Study project risk management and cost estimation approaches. Intended for double majors doing interdisciplinary projects in other departments.

Department consent required, see Senior Project Director for permission.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Software Engineering

CSCI 4348 (4) Startup Essentials: Entrepreneurial Projects in Computing

Provide students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept, and be evaluated on product/market fit. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. Formerly CSCI 4000.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5340

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 4358 (4) Entrepreneurial Projects II

Follows CSCI 4348. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5350

Requisites: Requires a prerequisite course of CSCI 4348 (minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4413 (3) Computer Security and Ethical Hacking

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5413

Requisites: Requires prerequisite course of CSCI 4273 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4446 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5446 and ECEN 4423 and ECEN 5423

Requisites: Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-).

Recommended: Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

Additional Information: Departmental Category: Numerical Computation

CSCI 4448 (3) Object-Oriented Analysis and Design

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5448

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 4502 (3) Data Mining

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5502

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4555 (3) Compiler Construction

Introduces the basic techniques used in translating programming languages: scanning, parsing, definition table management, operator identification and coercion, code selection and register allocation, error recovery. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5525 and ECEN 4553 and ECEN 5523

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 2400 or ECEN 3350 (all minimum grade C-).

Additional Information: Departmental Category: Programming Languages

CSCI 4576 (4) High-Performance Scientific Computing

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5576

Recommended: Prerequisite CSCI 3656.

Additional Information: Departmental Category: Numerical Computation

CSCI 4586 (4) High-Performance Scientific Computing 2

Introduces computing systems, software, and methods to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. Second course in a two-semester sequence.

Requisites: Requires prerequisite course of CSCI 4576 (minimum grade C-).

Additional Information: Departmental Category: Numerical Computation

CSCI 4593 (3) Computer Organization

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4593

Requisites: Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4753 (3) Computer Performance Modeling

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5753 and ECEN 4753 and ECEN 5753

Requisites: Requires prerequisite course of CSCI 3753 and MATH 2300 or APPM 1360 (all minimum grade C-).

Recommended: Requisite a course in statistics.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4802 (1) Data Science Team Companion Course

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5802

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of APPM 3310 or APPM 3570 or APPM 4520 or APPM 4570 or MATH 2130 or MATH 3510 or MATH 4510 or CSCI 2820 or CSCI 3022 or CVEN 3227 or ECEN 3810 or MCEN 4120 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5809 and ATLS 4809 and ATLS 5809

Additional Information: Departmental Category: Graphics

CSCI 4810 (1) Seminar in Computational Biology

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6810

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Computer Science

CSCI 4830 (1-3) Special Topics in Computer Science

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4831 (1-3) Special Topics in Algorithms

Covers topics of interest in computer science at the upper-division undergraduate level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of CSCI 3104 and CSCI 2820 or MATH 2130 or APPM 3310 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4900 (1-3) Upper Division, Undergraduate Level Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4950 (2-4) Senior Thesis

Provides an opportunity for senior computer science majors to conduct exploratory research in computer science. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of CSCI 3100 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: General Computer Science

CSCI 4960 (2-4) Computer Science Honors Thesis

Provides an opportunity for senior Computer Science majors to complete an honors thesis by conducting exploratory research in computer science. Department enforced prerequisites: successful completion of a minimum of 36 credit hours of Computer Science foundation and Computer Science electives and a writing requirement.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Computer Science

Computer Science - Bachelor of Science (BS)

The goal of the Department of Computer Science is to prepare students for an intriguing and satisfying career in computer science either in industry, research, or academia. The huge number of technical jobs and the continuing shortage of people to fill them mean that opportunities are great for today's computer science graduates when seeking career options or to continue on to graduate school.

The BS degree program in Computer Science emphasizes knowledge and awareness of computing at all levels, from circuits and computer architecture through operating systems and programming languages to large application systems; the theoretical and mathematical aspects of computing; the interdependence of hardware and software; and the challenge of large-scale software production and the engineering principles used to meet that challenge. Students may choose to take

classes that touch on a wide variety of computing topics, or may select classes that focus on a particular specialization.

For more information, visit the department's BS Degree (<http://www.colorado.edu/cs/current-students/undergraduate-students/bs-degree>) webpage.

Accreditation

The Bachelor of Science degree in computer science is accredited by the Computing Accreditation Commission of ABET (<http://www.abet.org>).

Program Educational Objectives

Our program educational objectives for students 3–5 years after graduating with a Bachelor of Science degree in computer science are that they will be:

- **Broadly Educated and Versatile.** Able to draw upon foundational knowledge, learn, adapt and successfully bring to bear analytical and computational approaches on changing societal and technological challenges
- **Inspiring and Collaborative.** Is a leader and a responsible citizen whose strengths come from an ability to draw on and contribute to diverse teams, expertise and experiences.
- **Innovative.** Drives scientific and societal advancement through technological innovation and entrepreneurship.
- **Engaged.** Is and remains engaged with the University of Colorado, the state of Colorado and technical and scientific professional communities.

Student Outcomes

Student outcomes describe what students are expected to know and be able to do by the time of graduation. The Computer Science Department's Bachelor of Science program must enable students to attain, by the time of graduation:

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
2. An ability to identify, formulate and develop solutions to computational challenges.
3. An ability to design, implement and evaluate a computational system to meet desired needs within realistic constraints.
4. An ability to function effectively on teams to accomplish shared computing design, evaluation or implementation goals.
5. An understanding of professional, ethical, legal, security and social issues and responsibilities for the computing profession.
6. An ability to communicate and engage effectively with diverse stakeholders.
7. An ability to analyze impacts of computing on individuals, organizations and society.
8. Recognition of the need for and ability to engage in continuing professional development.
9. An ability to use appropriate techniques, skills and tools necessary for computing practice.
10. An ability to apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computational systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

11. An ability to apply design and development principles in the construction of software systems of varying complexity.

Concurrent Degree Programs

BS/MS in Computer Science

Applicants must have completed two 3000-level computer science courses on the Boulder campus. A cumulative GPA of 3.750 or better is required to apply to this program. Very few exceptions will be granted on a case-by-case basis. Students need to gain admission to this program during their junior year.

Six credit hours of Computer Science courses at the 5000 level or above may be counted towards both sets of degree requirements, if chosen from the approved list.

For more information, visit the department's Concurrent BS/MS (<http://www.colorado.edu/cs/current-students/undergraduate-students/concurrent-bsms>) webpage.

BS/MS in Computer Science and Interdisciplinary Telecommunications

The Bachelor of Science degree is from the Department of Computer Science (CS) and the Master of Science degree is from the Interdisciplinary Telecommunications Program (ITP) (p. 1270). The concurrent program enables well-qualified students to be admitted to the MS program during the junior year of their BS program, and to work toward earning both the BS and MS degrees. This concurrent degree program is aimed at the specific needs of companies requiring engineers to operate at the intersection of software development and telecommunications.

For more information, visit the department's Concurrent BS/MS (<http://www.colorado.edu/cs/current-students/undergraduate-students/concurrent-bsms>) webpage.

Requirements

Requirements for the BS degree in computer science include course work in computer science, mathematics, natural science, and the humanities and social sciences, as well as free elective course work.

The degree provides considerable freedom in the selection of specific courses to fulfill these requirements, allowing students to tailor the degree to their individual needs and interests.

A student may not earn both a BS degree in computer science and a BA degree in computer science (p. 253) from CU Boulder. A student may not earn a bachelor's degree in computer science and a minor in computer science from CU Boulder.

For more information, visit the department's BS Degree (<http://www.colorado.edu/cs/current-students/undergraduate-students/bs-degree>) webpage.

Course Requirements

Course	Title	Credit Hours
First Year		
Fall Semester		
CSCI 1000	Computer Science as a Field of Work and Study	1

APPM 1350	Calculus 1 for Engineers	4
CSCI 1300 or CSCI 1310	Computer Science 1: Starting Computing or Computer Science 1: Starting Computing - Experienced	4
PHYS 1110	General Physics 1	4
Humanities and social sciences elective ¹		3
		Credit Hours 16
Spring Semester		
CSCI 2270	Computer Science 2: Data Structures	4
APPM 1360	Calculus 2 for Engineers	4
Natural science course		5
Humanities and social sciences elective ¹		3
		Credit Hours 16
Second Year		
Fall Semester		
CSCI 2400	Computer Systems	4
CSCI 2824	Discrete Structures (or other approved course)	3
CSCI 2820	Linear Algebra with Computer Science Applications (or other approved course)	3
CSCI 3308	Software Development Methods and Tools	3
Humanities and social sciences elective ¹		3
		Credit Hours 16
Spring Semester		
CSCI 3104	Algorithms	4
CS core course from approved core list (1 of 6)		3
CS core course from approved core list (2 of 6)		3
Humanities and social sciences elective ¹		3
Probability or statistics course from approved list of courses		3
		Credit Hours 16

Third Year**Fall Semester**

CSCI 3155	Principles of Programmin Languages	4
CS core course from approved core list (3 of 6)		3
College-approved writing course ²		3
Humanities and social sciences elective ¹		3
Natural science course		3
	Credit Hours	16

Spring Semester

CS core course from approved core list (4 of 6)		4
Computer science elective		3
Computer science elective		3
Natural science course		3
Free elective		3
	Credit Hours	16

Fourth Year**Fall Semester**

CSCI Senior Capstone I		4
CS core course from approved core list (5 of 6)		3
Natural science course		3
Humanities and social sciences elective ¹		3
Free elective		3
	Credit Hours	16

Spring Semester

CSCI Senior Capstone II		4
CS core course from approved core list (6 of 6)		3
Computer science elective		3
Humanities and social sciences elective ¹		3
Free elective		3
	Credit Hours	16
	Total Credit Hours	128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Computer Science - Minor

The department offers a minor in computer science that is available to CU Boulder undergraduates. The minor offers a basic introduction to the field of computer science.

A student may not earn both a bachelor's degree in computer science and the minor in computer science from CU Boulder.

For more information, visit the department's Minor in Computer Science (<http://www.colorado.edu/cs/current-students/undergraduate-students/minor>) webpage.

Requirements

A minor in computer science can be earned in conjunction with any CU Boulder major degree, except for computer science BA and BS majors.

Students should allow at least 6 semesters to complete the computer science minor. It is advised to start no later than first semester of the sophomore year; otherwise, students should plan to complete summer courses or delay graduation.

Advising for the minor is managed by the Computer Science Bachelor of Science advisors; see the department's Advisors (<http://www.colorado.edu/engineering-advising/advisors>) webpage for details.

For more information, visit the department's Minor in Computer Science (<http://www.colorado.edu/cs/current-students/undergraduate-students/minor>) webpage.

Prerequisites/Corequisites

Calculus courses do not count toward the 21 credit hours required for the computer science minor. Students should complete the following before pursuing the minor: MATH 1300 (or MATH 1310, APPM 1350 or APPM 1345); and MATH 2300 (or APPM 1360).

Required Courses and Semester Credit Hours

Required Courses

CSCI 1300	Computer Science 1: Starting Computing	4
or CSCI 1310	Computer Science 1: Starting Computing - Experienced	
or CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	
or ECEN 1310	C Programming for ECE	
CSCI 2270	Computer Science 2: Data Structures	4
CSCI 2400	Computer Systems (except ECEN majors; see advisor for details)	4
CSCI 2824	Discrete Structures (see advisor for other options)	3
or ECEN 2703	Discrete Mathematics for Computer Engineers	
Approved upper-division Computer Science electives to reach minimum 21 credit hours		6

Total Credit Hours 21

Electrical, Computer & Energy Engineering

Electrical Engineering offers study of the basic science and technology of information and energy. Its areas of knowledge include information theory and communications systems, computers and digital systems, signal processing and instrumentation, feedback systems and automatic control, electrical and electronic devices and systems, power electronics and renewable energy, electromagnetics and microwave devices and optics and photonic systems. Students learn how this basic knowledge is applied to such modern technologies as computers, telecommunications, biomedical systems, and remote sensing. The curriculum accommodates a variety of student interests including design, production, testing, consulting services, research, teaching, and management. Graduates pursue careers in a large variety of fields in the computer, telecommunications, instrumentation, biomedical, aerospace, energy, materials, and semiconductors industries, as well as academia. Some go on to careers in other professions such as law or medicine.

Electrical and computer engineering offers the same curriculum as electrical engineering, except that required courses in computer hardware and software replace some upper-division electives. As with electrical engineering, it accommodates broad student interests from design to service, and from research to management. Its graduates take positions in fields as diverse as those listed above for electrical engineering.

Course code for this program is ECEN.

Bachelor's Degree

- Electrical and Computer Engineering - Bachelor of Science (BS) (p. 710)
- Electrical Engineering - Bachelor of Science (BS) (p. 712)

Minor

- Computer Engineering - Minor (p. 710)
- Electrical Engineering - Minor (p. 714)
- Electrical Renewable Energy Systems - Minor (p. 714)
- Signals and Systems - Minor (p. 715)

Courses

ECEN 1030 (1-4) Special Topics

Special topics class.

ECEN 1100 (1) Freshman Seminar

Introduces students to areas of emphasis with the ECE department through seminars presented by faculty and outside speakers. Emphasizes career opportunities, professional ethics and practices, history of the profession, and resources for academic success. Several sessions promote team building and problem solving, and provide opportunities for freshmen to meet their classmates.

Additional Information: Departmental Category: General

ECEN 1310 (4) C Programming for ECE

Introduces fundamental programming concepts with engineering applications using C at a lower level of abstraction and MATLAB at a higher, application-focused level. Teaches the use of pointers, control flow, and data types. Example engineering applications include signal processing and the numerical computations. Includes a weekly computer lab session.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1310 or CSCI 1320

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Prerequisite APPM 1350.

Additional Information: Departmental Category: General

ECEN 1400 (3) Introduction to Digital and Analog Electronics

Introduces fundamental concepts in electrical and computer engineering such as Ohm's Law, capacitors, LEDs and 7-segment displays, transformers and rectifiers, digital logic, Fourier decomposition, frequency analysis. Lab work exposes students to commonly used instrumentation. Includes a final project. Skills in wiring, soldering and wire-wrapping are developed.

Additional Information: Departmental Category: General

ECEN 1500 (3) Sustainable Energy

Explores how energy is generated and used in today's society. Through collaborative discussion and hands-on data collection, students will analyze the engineering challenges, fundamental limits, and potential solutions to meeting our energy needs sustainably. Students will learn to analyze numerical data, estimate orders of magnitude, and apply mathematical methods in their own lives and in the ongoing energy debate. Basic algebra required.

Requisites: College of Engineering majors are excluded from this course.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills Departmental Category: General

ECEN 1840 (1-6) Independent Study

Provides an opportunity for freshmen to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2010 (1-5) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2020 (1-5) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2050 (1-5) Special Topics

Additional Information: Departmental Category: General

ECEN 2060 (1-5) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2250 (3) Introduction to Circuits and Electronics

Introduces linear circuit analysis and design, including OP-Amps. Presents DC networks, including node and mesh analysis with controlled sources. Analysis of RL and RC circuits for both transient and sinusoidal steady-state responses using phasors.

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 and PHYS 1120 (all minimum grade C-), and corequisite course of APPM 2360. Restricted to College of Engineering majors only.

Recommended: Prerequisite ECEN 1310 or CSCI 1300.

Additional Information: Departmental Category: General

ECEN 2260 (3) Circuits as Systems

Continues basic circuit analysis of ECEN 2250: Laplace transform techniques, transfer functions, frequency response, Bode diagrams, resonant circuits, Fourier series expansions, and convolution.

Requisites: Requires prerequisite course of ECEN 2250 (minimum grade C-). Restricted to College of Engineering students only.

Recommended: Corequisite ECEN 2270.

Additional Information: Departmental Category: General

ECEN 2270 (3) Electronics Design Lab

Provides an introduction to analysis, modeling, design, and testing of analog electronic circuits in a practical laboratory setting. The laboratory is centered around a robot platform and includes design, SPICE simulations, prototyping and testing of circuits necessary to drive and remotely control the robot.

Requisites: Requires prerequisite course of ECEN 2250 (minimum grade C-) and corequisite course of ECEN 2260. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 2350 (3) Digital Logic

Covers the design and applications of digital logic circuits, including both combinational and sequential logic circuits. Introduces hardware descriptive language, simulating and synthesis software, and programming of field programmable arrays (FPGAs).

Requisites: Requires prerequisite course of ECEN 1310 or CSCI 1300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 2410 (3) Renewable Sources and Efficient Electrical Energy Systems

Introduces electrical power generation and renewable energy, including solar, wind, micro, hydro, coal, nuclear and natural gas and some of the issues in integrating renewable energy sources in the grid.

Requisites: Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 2420 (3) Electronics for Wireless Systems

Explores fundamental principles behind the operation of a radio, including a practical introduction to circuit elements. Covers the components and operation of a radio (transmitter and receiver) with simple signals. Students learn lab exercises the operation principles behind components of a complete practical radio system.

Requisites: Requires prerequisite course of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) majors only.

Additional Information: Departmental Category: General

ECEN 2440 (3) Application of Embedded Systems

Introduces embedded systems and key computer architecture concepts through a variety of projects involving programming a microcontroller in C. Provides students hands-on projects that combine the knowledge gained in their digital and analog coursework in order to engineer hardware, firmware and application software design solutions. Includes a weekly lecture and two weekly laboratory sessions.

Requisites: Requires a prerequisite course of ECEN 1310 (minimum grade C-). Requires corequisite course of ECEN 2250.

Additional Information: Departmental Category: General

ECEN 2703 (3) Discrete Mathematics for Computer Engineers

Emphasizes elements of discrete mathematics appropriate for computer engineering. Topics: logic, proof techniques, algorithms, complexity, relations, and graph theory.

Requisites: Requires prerequisite courses of ECEN 1310 or CSCI 1300 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering students only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 2830 (1-5) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 2840 (1-6) Independent Study

Offers an opportunity for sophomores to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2841 (1-6) Independent Study

Offers an opportunity for sophomores to do independent, creative work.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 3002 (3-5) Special Topics

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 3003 (3-5) Special Topics

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3004 (3-5) Special Topics

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 3005 (2-3) Special Topics

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 3010 (3) Circuits and Electronics for Mechanical Engineers

Covers analysis of electrical circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits, and operational amplifiers. Includes introductory digital electronics and microprocessors/microcontrollers.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 3017

Requisites: Requires prereq course of PHYS 1120 (min grade C). Requires a prereq or coreq course of APPM 2360. Restricted to students with 57-180 credits (Jr or Sr) Mechanical Engr (MCEN) or Electrical Engr (ECEN) or Engineering Plus (GEEN) majors only.

Additional Information: Departmental Category: General

ECEN 3030 (3) Electrical/Electronic Circuits Non-Major

For students not majoring in electrical engineering. Covers analysis of electric circuits by use of Ohm's law; network reduction; superposition; node analysis; Thevenin's and Norton's theorems; sinusoidal signals; phasors; power in AC circuits; transient response, operation of simple circuits; rectifiers; transformers; 3-phase circuits; motors and generators.

Requisites: Requires prereq course of APPM 2360 (min grade C-).

Electrical Computer Engineering (ECEN), Electrical Engineering (EEEN), Electrical Computer Engineering and Electrical Engineering Concurrent Degree (C-ECEN/EEEN) mjrs are excluded from this course

Additional Information: Departmental Category: General

ECEN 3070 (3) Edges of Science

Examines the evidence for paranormal phenomena, reasons for skepticism, and physical models that could account for the data. Reviews controversial scientific theories that overcame barriers to acceptance, and how worldviews shift. Considers the scientific method and ways uncontrolled factors might influence experiments. Develops skills in statistical analysis of data. Includes group projects testing for anomalous and parapsychological effects. Not accepted as a technical elective for engineering majors.

Requisites: Requires prerequisite course of MATH 1011 (minimum grade C-).

Additional Information: Departmental Category: General

ECEN 3170 (3) Electromagnetic Energy Conversion 1

Real and reactive power in single phase circuits, power triangle, balanced three-phase circuits, wye and delta connections, introduction to electromagnetic machines, transformers (single and three-phase) and their equivalent circuits, AC-machinery fundamentals, synchronous generator from a magnetic field point of view, synchronous motors and condensers, three-phase induction motors, DC machinery fundamentals, DC motors, single phase motors. Matlab/Simulink will be used.

Requisites: Requires prerequisite courses of ECEN 2260 and PHYS 1120 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 3250 (3) Microelectronics

Develops a basic understanding of active semiconductor devices. Focuses on building an understanding of BJT and CMOS devices in both digital and analog applications.

Requisites: Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3300 (3) Linear Systems

Characterization of linear time-invariant systems in time and frequency domains. Continuous time systems are analyzed using differential equations and Laplace and Fourier transforms. Discrete time systems are analyzed using difference equations, Z-transforms and discrete time Fourier transforms. Sampling and reconstruction of signals using the sampling theorem. Applications of linear systems include communications, signal processing, and control systems.

Requisites: Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3303 (3) Introduction to Robotics

Introduces students to fundamental concepts in autonomous, mobile robotics: mechanisms, locomotion, kinematics, control, perception and planning. The course consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3302

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3320 (3) Semiconductor Devices

Highlights the fundamentals of semiconductor materials and devices. Topics include the electrical and optical properties of semiconductors, the theory of Pn junctions, bipolar and field-effect transistors, and optoelectronic devices.

Requisites: Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3350 (3) Programming Digital Systems

Explores how computers and programmable hardware in general are used to implement digital systems by looking at the capabilities of central processing units, the use and control of various input/output (I/O) devices, memory organization, and concurrency management. Topics include computer architecture, instruction sets, I/O device programming, interrupts, data transfer mechanisms, semaphores, and memory management.

Requisites: Requires prerequisite course of ECEN 2350 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3360 (3) Digital Design Laboratory

Introduces digital system design, including system software and hardware building blocks, and system software-hardware integration. Emphasizes hands-on system development and debugging. Uses mainstream electronic system design platforms, including FPGAs, embedded and mobile computing platforms, and Assembly/C/Java/Verilog programming languages.

Requisites: Requires prerequisite course of ECEN 3350 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3400 (3) Electromagnetic Fields and Waves

Electromagnetic fields are covered at an introductory level, starting with electrostatics and continuing with DC current, magnetostatics, time-varying magnetic fields, waves on transmission lines, Maxwell's equations and the basics of plane waves. The use of fields in inductors, capacitors, resistors, transformers, and energy and power concepts are studied.

Requisites: Requires prerequisite courses of APPM 2350, APPM 2360, PHYS 1120 and ECEN 2250 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3410 (3) Electromagnetic Waves and Transmission

Covers reflected and transmitted plane waves in layered media, Poynting's theorem of electromagnetic power, two-conductor transmission line theory and practice, Smith chart usage and impedance matching, waveguides, and elements of antenna theory.

Requisites: Requires prerequisite course ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 3810 (3) Introduction to Probability Theory

Covers the fundamentals of probability theory, and treats the random variables and random processes of greatest importance in electrical engineering. Provides a foundation for study of communication theory, control theory, reliability theory, and optics.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4510 or APPM 3570

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3840 (1-6) Independent Study

Offers an opportunity for juniors to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 3841 (1-6) Independent Study

Offers an opportunity for juniors to do independent, creative work.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 3930 (6) ECE Co-op Education

Participate in a cooperative education program working with a corporate or government entity. Individual assignments are arranged between the department and the outside employer. Offered only through Continuing Education. Department enforced prerequisite: sophomore, junior or senior EEEN and ECEN majors and 2.85 GPA.

Repeatable: Repeatable for up to 24.00 total credit hours.

Requisites: Requires prerequisite courses of ECEN 2260 and ECEN 3350 (all minimum grade C-).

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

ECEN 4000 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 4001 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Bioengineering

ECEN 4002 (1-4) Special Topics

Credit and subject matter to be arranged. Department enforced prerequisite: varies

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4003 (1-4) Special Topics

Credit and subject matter to be arranged. Department enforced prerequisite: varies

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

ECEN 4004 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4005 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4006 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Optics

ECEN 4007 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4009 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 4011 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5011

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Bioengineering

ECEN 4012 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4013 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4016 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Additional Information: Departmental Category: Optics

ECEN 4017 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Additional Information: Departmental Category: Power

ECEN 4018 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4021 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4022 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4024 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5024

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4026 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4028 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4031 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4033 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4043 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4049 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 4053 (1-4) Special Topics

Special topics course.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5053

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4106 (3) Photonics

Deals with the generation, transmission, modification and detection of light. Applications include fiber optics communications, data storage, sensing, and imaging. Leads to understanding of fundamental physical principles used in the analysis and design of modern photonic systems.

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Requires a corequisite course of ECEN 3300. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Optics

ECEN 4116 (3) Introduction to Optical Communications

Given data rates, distance, reliability or bit error rates, the information required to specify the type of fiber, the source, the wave length, type of modulation, repeater or optical amplifiers, and detectors will be presented.

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Optics

ECEN 4120 (3) Neural Network Design

Introduces basic (artificial) neural network architectures and learning rules. Emphasizes mathematical analysis of these networks, methods of training them and application to practical problems such as pattern recognition, signal processing and control systems. Shows how to construct a network of "neurons" and train them to serve a useful function.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5120

Requisites: Requires prerequisite courses of APPM 2360 or MATH 2130 and ECEN 1310 or CSCI 1300 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 4138 (3) Control Systems Analysis

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Department enforced prerequisite: background in Laplace transforms, linear algebra, and ordinary differential equations.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5138

Requisites: Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4167 (3) Electromagnetic Energy Conversion 2

Introduction to electric machine drives, basic electric machine mechanics, structure and modeling of electric machines (DC, Synchronous, Linear, Induction), reference frame theory using d-q modeling based on the complex space vector and on matrix transformation, transient and steady state analysis of three-phase machine, design of speed regulators, vector control. Matlab/Simulink will be used.

Requisites: Requires prerequisite course of ECEN 3170 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4224 (3) High Speed Digital Design

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5224

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4242 (3) Communication Theory

Covers modern digital and analog communication systems. Analysis and design of communication signals, transmitters, channels, and receivers. Amplitude and angle modulation and demodulation are treated as well as theory and application of digital data transmission. Emphasis is also placed on the analysis and mitigation of the effects of noise through signal design at the transmitter and signal processing at the receiver.

Requisites: Requires prerequisite course of ECEN 3300 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4313 (3) Concurrent Programming

Introduces the theory and practice of multicore programming. The first part of the course presents foundations of concurrent programming: mutual exclusion, wait-free and lock-free synchronization, spin locks, monitors, memory consistency models. The second part presents a sequence of concurrent data structures and techniques used in their implementations (coarse-grained, fine-grained, optimistic and lock-free synchronization).

Requisites: Requires a prerequisite course of ECEN 1310 or CSCI 1300 or CSCI 1310 (all minimum grade C-).

Grading Basis: Letter Grade

ECEN 4324 (3) Fundamentals of Microsystem Packaging

Introduction to the fundamentals of microsystems packaging. A seminar style course which surveys topics in microsystem packaging such as electrical package design, design for reliability, thermal management, multichip packaging, IC Assembly, sealing and encapsulation, and board assembly.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5324

Requisites: Requires prerequisite course or corequisite course of ECEN 3410 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4341 (3) Bioelectromagnetics

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5341

Requisites: Requires prerequisite courses of ECEN 3400 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4375 (3) Microstructures Laboratory

Offers experience in monolithic silicon integrated circuit fabrication techniques, including layout, pattern compiling and generation, mask making, oxidation, photolithography, diffusion, implantation, metallization, bonding, process analysis and testing. Includes design project.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5375

Requisites: Requires prerequisite course of ECEN 3320 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 4423 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5423 and CSCI 4446 and CSCI 5446

Requisites: Requires prerequisite courses of APPM 1360 or MATH 2300 and ECEN 1310 or CSCI 1300 and PHYS 1110 (all minimum grade C-). Restricted to College of Engineering majors only.

Recommended: Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4517 (3) Power Electronics and Photovoltaic Power Systems Laboratory

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5517

Requisites: Requires prerequisite course of ECEN 4797 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4532 (3) Digital Signal Processing Laboratory

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5532

Requisites: Requires prerequisite course of ECEN 4632 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4553 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5523 and CSCI 4555 and CSCI 5525

Requisites: Requires prerequisite courses of ECEN 2703 and ECEN 3350 (all minimum grade C). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4555 (3) Principles of Energy Systems and Devices

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5555

Requisites: Requires prerequisite courses of ECEN 3810 or APPM 3570 or MATH 4510 and PHYS 2130 or PHYS 2170 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Nanostructures and Devices

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 4583 (3) Software System Development

Lectures deal with techniques for product requirements definition, project planning, coding, verification, validation, performance evaluation, and maintenance of medium-scale (2-3000 line) systems. Primary emphasis is on practical application of these techniques to a specified software project. Students work in teams to produce appropriate documents for each phase and are responsible for project completion according to specification and schedule. Course project is written in C on a Unix look-alike system; prior knowledge of C or Unix is not required.

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4593 (3) Computer Organization

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4593

Requisites: Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4606 (3) Undergraduate Optics Laboratory

Introduces fundamental concepts, techniques, and technology of modern optical and photonic systems. Individual labs cover particular fields of optical technology, including light sources such as lasers and LEDs, interferometers, fiber-optic communications, photodetection, spectrometers, and holography. Practical skills such as how to align an optical system will also be emphasized.

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Optics

ECEN 4610 (3) Capstone Laboratory Part 1

Hands-on laboratory experience utilizing teams in the systematic proposal, design, integration, and testing of an electronic/computer based system. Results will be the prototype of a stand-alone analog/digital system. Must have completed all required Advanced Analog Core courses for major, except one course may be taken concurrently by petition. Must take ECEN 4620 to complete the sequence. Minimum required grade for this course and ECEN 4620 is C-.

Requisites: Requires prereq of ECEN 3360 either ECEN 3250 3300; or ECEN 3250 3400; or ECEN 3300 3400 (min grade C-). Restricted to Elect/Comp Engr (ECEN) or Elect Engr (EEEN) or Elect/Comp Engr or Elect Engr Concurrent Degree (C-EEEN or C-ECENEEN) mjrs only

Additional Information: Departmental Category: General

ECEN 4616 (3) Optoelectronic System Design

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5616

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-).

Additional Information: Departmental Category: Optics

ECEN 4620 (3) Capstone Lab, Part 2

Hands-on laboratory experience for teams in the systematic proposal, design, build integration, test and documentation of an electronic/computer based system. Results will be a reliably operating, stand-alone analog/digital system, with publication quality technical documentation. Department enforced prerequisite: advanced analog core courses.

Requisites: Requires prerequisite course of ECEN 4610 (minimum grade C-). Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) or ECEE concurrent (C-EEEN or C-ECENEEN) majors only.

Additional Information: Departmental Category: General

ECEN 4632 (3) Introduction to Digital Filtering

Covers both the analysis and design of FIR and IIR digital filters. Discusses implementations in both software and hardware. Emphasizes use of the FFT as an analysis tool. Includes examples in speech processing, noise canceling, and communications.

Requisites: Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4633 (3) Hybrid Embedded Systems

Introduces system hardware and design techniques for embedded and hybrid reconfigurable systems. Intended for those interested in developing projects using hardware description languages to build application-specific computing systems. Industry standards are used for design, development and debugging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5633

Requisites: Requires prerequisite courses of ECEN 3350 and ECEN 4593 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4634 (3) Microwave and RF Laboratory

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5634

Requisites: Requires prerequisite course of ECEN 3410 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4638 (3) Control Systems Laboratory

Provides experience in control system design and analysis, using both real hardware and computer simulation. Covers the entire control system design cycle: modeling the system, synthesizing a controller, conducting simulations, analyzing the design to suggest modifications and improvements, and implementing the design for actual testing.

Requisites: Requires prerequisite course of ECEN 4138 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4643 (3) SW Engineering of Concurrent Systems

Addresses engineering of applications requiring multiple software processes running concurrently, sharing data, and communicating as a system in a single environment. Topics include performance analysis of architecture design; analysis of requirements, design and testing of synchronization and communication; the interplay of system design and performance with the impact of memory management, input/output, and file system support.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5643

Requisites: Requires prerequisite course of ECEN 4583 or ECEN 5543 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4652 (3) Communication Laboratory

Analysis and design of realistic communication signals in a modern digital signal processing environment. Covers both analog and digital communication signals with and without noise and distortion. Pulse amplitude modulation is used initially at baseband and then combined with amplitude and phase/frequency modulation to produce the kind of bandpass signals that are used in cell phones and wireless data networks.

Requisites: Requires prerequisite course of ECEN 4242 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4653 (3) Real-Time Digital Media

Learn how to design and build Linux-based real-time system applications for digital media encode/decode and transport. Course focus is on the process as well as fundamentals of designing, coding, and testing Linux-based real-time systems often used in industry for digital media systems. Students use POSIX kernel-mapped threads and drivers to implement real-time digital media solutions.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5653

Requisites: Requires prerequisite course of ECEN 1030 or ECEN 1310 or CSCI 1300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4743 (3) SW Engineering of Distributed Systems

Addresses engineering of networked applications and self-contained embedded system products involving multiple processors. The fundamental concepts of software engineering are complicated by an application running simultaneously and asynchronously on multiple processors over a network. Topics: specification, analysis, design, and testing of distributed components including concerns of security, synchronization, transaction coordination, data replication, web services, and service oriented architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5743

Requisites: Requires prerequisite course of ECEN 4583 or ECEN 5543 or CSCI 5548 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4753 (3) Computer Performance Modeling

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5753 and CSCI 4753 and CSCI 5753

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C-). Restricted to College of Engineering majors only.

Recommended: Prerequisite a course in statistics.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4797 (3) Introduction to Power Electronics

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5797

Requisites: Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4811 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5811 and ASEN 4216 and ASEN 5216

Requisites: Requires prerequisite course of ECEN 2260 or ECEN 3030 or ASEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4821 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5821 and ASEN 4426 and ASEN 5426

Requisites: Requires prerequisite course of ECEN 2260 or ECEN 3030 or ASEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4827 (3) Analog IC Design

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5827

Requisites: Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4831 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5831 and ASEN 5436

Requisites: Requires prerequisite course of ECEN 2260 or ECEN 3030 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4840 (1-6) Independent Study

Offers an opportunity for seniors to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 4841 (1-6) Independent Study

Offers an opportunity for seniors to do independent, creative work.

Repeatable: Repeatable for up to 6.00 total credit hours.

ECEN 5000 (3) Graduate Professional Seminar

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

ECEN 5005 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5008 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5009 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5011 (1-4) Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4011

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Bioengineering

ECEN 5012 (3) Special Topics

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5013 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

ECEN 5016 (1-4) Special Topics

Additional Information: Departmental Category: Optics

ECEN 5018 (1-4) Special Topics

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5021 (1-4) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Bioengineering

ECEN 5023 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering, Embedded Systems.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5024 (1-4) Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4024

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5028 (1-4) Special Topics

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5032 (3) Special Topics

Additional Information: Departmental Category: Bioengineering

ECEN 5049 (1-4) Special Topics

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5053 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering - Embedded Engineering.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4053

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5104 (3) Computer-Aided Microwave Circuit Design

Emphasizes the design of strip-line and microstrip circuits, using a CAD package. Discusses design of impedance transformers, amplifiers, switches, phase-shifters, etc. Assignments include design of typical circuits and their analysis using a microwave circuit analysis program. Laboratory includes measurements using a network analyzer facility on a typical circuit designed and fabricated by students.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5107 (3) Electric Power Grid

Examines the electrical grid, including conventional generation, transmission/ distribution, and new renewable generation technologies. Issues including grid stability, the increase in variable generation on the grid, and how the electrical grid will change in the future will be addressed. Intended for students with an engineering background from outside electrical engineering who desire an introduction to the power grid.

Requisites: Excludes graduate students in Electrical Engineering or Electrical Engineering Concurrent degree plans.

Additional Information: Departmental Category: Power

ECEN 5114 (3) Waveguides and Transmission Lines

Intermediate course dealing with guided-wave systems at HF, microwave, and optical frequencies. Modern waveguiding structures, including circular metallic waveguides, microstrip transmission lines, and optical waveguides are treated. Additional material may include waveguide losses, excitation of waveguides, microwave network theory, coupled-mode theory, resonators, and pulse propagation in waveguides.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5120 (3) Neural Network Design

Introduces basic (artificial) neural network architectures and learning rules. Emphasizes mathematical analysis of these networks, methods of training them and application to practical problems such as pattern recognition, signal processing and control systems. Shows how to construct a network of "neurons" and train them to serve a useful function.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4120

Additional Information: Departmental Category: General

ECEN 5122 (3) Wireless Local Area Networks

Examines small-scale wireless networks particularly personal and local area networks. Covers licensed and unlicensed spectrum, indoor and small-scale radio propagation, modulation techniques, network topologies, ad hoc and infrastructure networks, protocol design, TCP/IP-wireless interactions and protocol standards.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5520

Requisites: Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

Recommended: Prerequisite TLEN 5430.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5128 (3) Game Theory and Multiagent Systems

Provides an overview of game theory with a special emphasis on its application to multiagent systems, i.e., systems that are comprised of a collection of interacting and possibly competing decision making entities. Examples drawn from engineered, economics and social models, including multivehicle robotics, data networks, sensor networks and electronic commerce.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5134 (3) Electromagnetic Radiation and Antennas

Covers elementary sources and antennas, cylindrical wire antennas, loop antennas, radiation patterns and antenna gain, aperture sources such as horns and dishes, specialized antennas such as microstrip patches, linear and circular arrays, mutual coupling and ground effects, ray and numerical formulations, transmission formulas, and antenna applications.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5138 (3) Control Systems Analysis

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Topics covered in this course will be investigated in more depth, require external readings, additional homework will be assigned, and the exams will be more difficult.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4138

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3300.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5139 (3) Computer-Aided Verification

Covers theoretical and practical aspects of verification of finite-state systems (hardware) and infinite-state systems (programs). Model checking: temporal logics, explicit-state and symbolic search, BDDs. Constraint solvers: SAT solvers, decision procedures. Program verification: invariants, partial vs. total correctness, abstraction. Department enforced requisite: general proficiency in discrete mathematics and programming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5135

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite CSCI 2824.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5154 (3) Computational Electromagnetics

Provides a computational study of microwave circuits and antennas, using finite-difference, finite-element, and moment methods. Requires students to develop algorithms, write and execute programs, and prepare reports analyzing results. Circuits include waveguides, microstrip lines, and center-fed dipole antennas.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5156 (3) Physical Optics

Covers the application of Maxwell's equations to optical wave propagation in free space and in media. Topics include polarization, dispersion, geometrical optics, interference, partial coherence, and diffraction.

Recommended: Prerequisite ECEN 3410.

Additional Information: Departmental Category: Optics

ECEN 5166 (3) Guided Wave Optics

Builds up the concepts necessary to understand guided wave optical systems. Topics include slab wave-guides, semiconductor lasers, fiber optics, and integrated optics.

Requisites: Requires prerequisite courses of ECEN 5645 and ECEN 5156 (all minimum grade C-).

Additional Information: Departmental Category: Optics

ECEN 5224 (3) High Speed Digital Design

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4224

Requisites: Requires a prereq course of ECEN 3400 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5254 (3) Remote Sensing Signals and Systems

Examines passive and active techniques for remote sensing with emphasis on fundamental noise and detection issues from radio to optical frequencies. Emphasis is placed on electromagnetic wave detection, statistical signal and noise analysis, remote sensing system architecture, and hardware for remote sensing systems. Systems studied include radiometers, radars (real and synthetic aperture), interferometers, and lidars. Applications to detection and surveillance, Earth remote sensing, astronomy, and imaging systems are covered.

Requisites: Requires prerequisite courses of ECEN 3300 and ECEN 3400.

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5264 (3) Electromagnetic Absorption, Scattering, and Propagation

Electromagnetic waves in communication, navigation, and remote sensing systems from radio to optical frequencies, including propagation in deterministic and random media. Topics include absorption and refraction by gases, discrete scattering by precipitation, clouds, and aerosols, continuous scattering by refractivity fluctuations, earth-space propagation and Faraday rotation in plasmas, and radiative transfer theory.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prereqs are ECEN 3400 and ECEN 3410.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5273 (3) Network Systems

Focusing on the design and implementation of network protocols and algorithms. Topics covered include the internet's layered protocol stack, TCP/IP, Web/HTTP, email/SMTP, DNS, Ethernet, wireless networks, secure networking. Students will learn socket-based network programming. Familiarity with C and UNIX required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4273 and CSCI 5273

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5274 (3) Radar Science and Techniques

Studies atmospheric radar fundamentals. Examines scattering by precipitation and atmospheric turbulence; long-wavelength radars and the dynamics of the middle and upper atmosphere; design of meteorological and clear-air radars; profiling tropospheric winds, temperature, and humidity by radar and radiometry; and ionospheric sounding using ionosondes and incoherent-scatter radars.

Requisites: Requires prerequisite course of ECEN 5254 (minimum grade C-).

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5322 (3) Search Engine & Analysis of High-dimensional Dataset

Provides students with an exposition of the novel algorithmic methods for searching and analyzing big data. The class includes a project: students design a content-based music information retrieval system similar to those used by Gracenote, Shazam, or Pandora.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5324 (3) Fundamentals of Microsystem Packaging

Introduction to the fundamentals of microsystems packaging. A seminar style course which surveys topics in microsystem packaging such as electrical package design, design for reliability, thermal management, multichip packaging, IC Assembly, sealing and encapsulation, and board assembly.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4324

Requisites: Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5341 (3) Bioelectromagnetics

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4341

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Bioengineering

ECEN 5345 (3) Introduction to Solid State Physics

Provides an introduction to the electronic, photonic and phononic properties of solid state materials and devices. Covers optical constants, free electron gas, plasmons, energy bands, semiconductors and doping, excitons, quantum wells, phonons and electrooptical effects. Makes use of quantum mechanical methods. Department enforced prerequisite: basic quantum mechanics.

Requisites: Restricted to any graduate student or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5355 (3) Principles of Electronic Devices 1

Relates performance and limitations of solid state devices to their structures and technology. Examines semiconductor physics and technology. Includes Pn-junction, Mos, and optoelectronic devices. For both advance circuit and device engineers.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3320.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5358 (3) Optimization and Optimal Control

Introduces the theory and practice of optimization and optimal control. Topics include basic theory, nonlinear system trajectories and regulation, function space operators and derivatives, optimality conditions, barrier functionals and Newton's method in function space.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 5448.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5375 (3) Microstructures Laboratory

Offers experience in monolithic silicon integrated circuit fabrication techniques, including Ic layout, pattern compiling and generation, mask making, oxidation, photolithography, diffusion, implantation, metallization, bonding, process analysis and testing. Includes design project.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4375

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5418 (3) Automatic Control Systems 1

Coverage of principles of control systems with Multiple Inputs and Multiple Outputs (MIMO). Topics include Mimo state-space theory, applications of the singular value decomposition (SVD), coprime factorization methods, frequency domain topics, and an introduction to H-infinity design.

Requisites: Requires prerequisite course of ECEN 5448 (minimum grade C-).

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5423 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4423 and CSCI 4446 and CSCI 5446

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5438 (3) Robot Control

Provides a comprehensive treatment of the mathematical modeling of robot mechanisms and the analysis methods used to design control laws for these mechanisms.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites PHYS 1110 and ECEN 4138 (minimum grade C-).

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5448 (3) Advanced Linear Systems

Offers a state space approach to analysis and synthesis of linear systems, state transition matrix, controllability and observability, system transformation, minimal realization, and analysis and synthesis of multi-input and multi-output systems.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5458 (3) Sampled Data and Digital Control Systems

Provides an analysis and synthesis of discrete-time systems. Studies sampling theorem and sampling process characterization, z-transform theory and z-transferfunction, and stability theory. Involves data converters (A/D and D/A), dead-beat design, and digital controller design.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5503 (3) Computer Systems Design and Architecture

Covers digital logic circuits, assembly language programming, and gate-level computer design and architecture. Also discusses computer arithmetic algorithms, I/O, peripheral device performance, networking, and the Internet. Limited to graduate students. For ECE/CS majors with nontraditional backgrounds.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5517 (3) Power Electronics and Photovoltaic Power Systems Laboratory

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4517

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5523 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4553 and CSCI 4555 and CSCI 5525

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5532 (3) Digital Signal Processing Laboratory

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4532

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5533 (3) Fundamental Concepts of Programming Languages

Considers concepts common to a variety of programming languages--how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5535

Requisites: Requires prerequisite course CSCI 3155 (minimum grade D-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5543 (3) Software Engineering of Standalone Programs

Applies engineering principles to phases of software product development, project planning, requirements definition, design, design patterns, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections, and modeling (primarily UML). Includes relation to embedded systems and object-oriented design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5548

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 1300 and CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5553 (3) Parallel Processing

Examines a range of topics involved in using parallel operations to improve computational performance. Discusses parallel architectures, parallel algorithms and parallel programming languages. Architectures covered include vector computers, multiprocessors, network computers and data flow machines. Department enforced prerequisite: background in computer organization, introduction to programming languages and elementary numerical analysis.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5551

Recommended: Prerequisites ECEN 4593 and CSCI 3653.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5555 (3) Principles of Energy Systems and Devices

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4555

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors) or Graduate students only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5573 (3) Advanced Operating Systems

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5573

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5583 (3) Artificial Intelligence

Surveys artificial intelligence methods, theories and applications. Studies the relationship between artificial intelligence and psychology, linguistics and philosophy. Introduces artificial intelligence programming.

Requisites: Requires prerequisite course CSCI 3245 (minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5593 (3) Advanced Computer Architecture

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a processor, out-of-order instruction issue and superscalar designs, design of cache memory systems for such systems, and architectural features required for multicore processor designs. Also studies current and historically important computer architectures.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5593

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 4593.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5603 (3) Software Project Management

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5608 and EMEN 5031

Requisites: Requires prerequisite courses ECEN 4583 and ECEN 5543 and CSCI 4318 (all minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5606 (3) Optics Laboratory

Provides advanced training in experimental optics. Consists of optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers, and holograms and experimentation of fiber optics and Fourier optics. Department enforced prerequisite: undergraduate optics course (e.g. PHYS 4510).

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5606

Additional Information: Departmental Category: Optics

ECEN 5612 (3) Random Processes for Engineers

Deals with random time-varying functions and is therefore useful in the broad range of applications where they occur. Topics include review of probability, convergence of random sequences, random vectors, minimum mean-square error estimation, basic concepts of random processes, Markov processes, Poisson processes, Gaussian processes, linear systems with random inputs, and Wiener filtering. Applications range from communications, communication networks, and signal processing to random vibration/stress analysis, mathematical finance, physics, etc.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5613 (3) Embedded System Design

Introduces system hardware and firmware design for embedded applications. Students independently design and develop a hardware platform encompassing a microcontroller and peripherals. Firmware is developed in C and assembly. A significant final project is designed, developed, documented and presented. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5616 (3) Optoelectric System Design

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4616

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Optics

ECEN 5622 (3) Information Theory and Coding

Covers fundamental limits of data compression, reliable transmission of information and information storage. Topics include information measures, typicality, entropy rates of information sources, limits and algorithms for lossless data compression, mutual information, and limits of information transmission over noisy wired and wireless links. Optional topics include lossy data compression, limits of information transmission in multiple-access and broadcast networks, and limits and algorithms for information storage.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5623 (3) Real-Time Embedded Systems

Design and build a microprocessor-based embedded system application requiring integration of sensor/actuator devices, a real-time operating system and application firmware and software. Real-time rate monotonic theory and embedded architecture are covered. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5626 (3) Active Optical Devices

Analysis of active optical devices such as semiconductor laser, detector and flat panel display by clearly defining and interconnecting the fundamental physical mechanism, device design and operating principles and device performance.

Recommended: Prerequisite ECEN 5355.

Additional Information: Departmental Category: Optics

ECEN 5632 (3) Theory and Application of Digital Filtering

Digital signal processing and its applications are of interest to a wide variety of scientists and engineers. The course covers such topics as characterization of linear discrete-time circuits by unit pulse response, transfer functions, and difference equations, use of z-transforms and Fourier analysis, discrete Fourier transform and fast algorithms (FFT), design of finite and infinite impulse response filters, frequency transformations, study of optimized filters for deterministic signals.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5633 (3) Hybrid Embedded Systems

Introduces system hardware and design techniques for embedded and hybrid reconfigurable systems. Intended for those interested in developing projects using hardware description languages to build application-specific computing systems. Industry standards are used for design, development and debugging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4633

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5634 (3) Graduate Microwave and RF Laboratory

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4634

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5643 (3) SW Engineering of Concurrent Systems

Addresses engineering of applications requiring multiple software processes running concurrently, sharing data, and communicating as a system in a single environment. Topics include performance analysis of architecture design; analysis of requirements, design and testing of synchronization and communication; the interplay of system design and performance with the impact of memory management, input/output, and file system support.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4643

Requisites: Requires prerequisite course of ECEN 5543 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5645 (3) Introduction to Optical Electronics

Introduces lasers, Gaussian optics, modulators, nonlinear optics, optical detectors, and other related devices.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5652 (3) Detection and Extraction of Signals from Noise

Introduces detection, estimation, and related algorithms. Topics in detection include simple/composite hypothesis testing, repeated observations and asymptotic performance and sequential detection. Topics in estimation include Bayesian estimation including minimum mean-square estimation and non-random parameter estimation. Topics in algorithms vary. Examples include algorithms for state estimation and smoothing in Hidden Gauss-Markov models and the expectation-maximization algorithm. Applications include communications, radar/sonar/geophysical signal processing, image analysis, authentication, etc.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5653 (3) Real-Time Digital Media

Learn how to design and build Linux-based real-time system applications for digital media encode/decode and transport. Course focus is on the process as well as fundamentals of designing, coding, and testing Linux-based real-time systems often used in industry for digital media systems. Students use POSIX kernel-mapped threads and drivers to implement real-time digital media solutions.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4653

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5672 (3) Digital Image Processing

Course objective is to present the fundamental techniques available for image representation and compression (e.g., wavelets), filtering (e.g., Wiener and nonlinear filter), and segmentation (e.g., anisotropic diffusion).

Requisites: Requires prerequisite course ECEN 5632 (minimum grade C-).

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5673 (3) Distributed Systems

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5673

Recommended: Prerequisite CSCI 5573 or a course in computer networks.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5682 (3) Theory and Practice of Error Control Codes

Introduces error control coding techniques for reliable transmission of digital data over noisy channels. Topics include algebraic characterizations of cyclic codes, convolutional codes, modern graph codes, decoding algorithms for block codes, Viterbi algorithm and iterative decoding on graphs. Applications include modern digital communication and storage systems including deep space communications, satellite broadcasting, cellular networks, and optical disk storage.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5683 (3) Programmable Logic Embedded System Design

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explores complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5686 (3) Optical Communications Systems

Emphasizes the elements that optical communication systems have in common with other communication systems. Works from a general communication system model toward fiber optic applications. Emphasizes the statistical nature of electronic based communication. Topics include 1) general system models, 2) detectors and receivers, 3) optical channels with emphasis on the single mode fiber channel, 4) coherent and incoherent systems: a) sources, b) modulation and c) detection, 5) special topics ranging from optical sensing to quantum communications.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Optics

ECEN 5692 (3) Principles of Digital Communication

Introduces fundamental principles of efficient and reliable transmission of information used in wired and wireless digital communication systems including cable modems, smart phones/tablets, cellular networks, local area (wi-fi) networks, and deep-space communications. Topics include bandwidth and power constraints, digital modulation methods, optimum transmitter and receiver design principles, error rate analysis, channel coding potential in wired/wireless media, trellis coded modulation, and equalization.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5696 (3) Fourier Optics

Introduces a system level approach to the analysis and design of optical systems. Topics include holography, Fourier transform properties of lenses, two-dimensional convolution and correlation functions, spatial filtering and optical computing techniques. Also covers coherent and incoherent imaging techniques, tomography, and synthetic aperture imaging.

Recommended: Prerequisites ECEN 3300 and ECEN 3410.

Additional Information: Departmental Category: Optics

ECEN 5737 (3) Adjustable-Speed AC Drives

Presents unified treatment of complete electrical drive systems: mechanical load, electrical machine, power converter, and control equipment. Emphasizes induction, synchronous, and permanent-magnet drives. Uses simulation programs (e.g., SPICE, Finite Element/Difference Program) to simulate drive system components (e.g., gating, inverter, electric machine).

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3170.

Additional Information: Departmental Category: Power

ECEN 5743 (3) SW Engineering of Distributed Systems

Addresses engineering of networked applications and self-contained embedded system products involving multiple processors. The fundamental concepts of software engineering are complicated by an application running simultaneously and asynchronously on multiple processors over a network. Topics: specification, analysis, design, and testing of distributed components including concerns of security, synchronization, transaction coordination, data replication, web services, and service oriented architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4743

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Prerequisite ECEN 4583 or ECEN 5543 or CSCI 5548.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5753 (3) Computer Performance Modeling

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4753 and CSCI 4753 and CSCI 5753

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5763 (3) Embedded Machine Vision and Intelligent Automation

Introduces students to machine vision and machine learning methods used in automation, autopilots and security and inspection systems. Embedded and automation topics include implementation of algorithms with FPGA or GP-GPU embedded real time co-processing for autopilots (intelligent transportation), general automation and security including methods for detection, classification, recognition of targets for inspection, surveillance, search and rescue, and machine vision navigation applications.

Requisites: Requires prereq courses of ECEN 5613 and 5623 (all minimum grade of C). Restricted to EEEN or ECEN or C-ECENEEEN or C-EEEN or CRTGE students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5797 (3) Introduction to Power Electronics

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4797

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Power

ECEN 5803 (3) Mastering Embedded Systems Architecture

Acquire an understanding of embedded systems architectures for the purpose of creating prototypes or products for a variety of applications. The salient issues in the decision making process will be examined, including trade-offs between hardware and software implementations, processor and operating system selection and IP creation or acquisition. Projects will involve the latest software development and tools and hardware platforms.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5807 (3) Modeling and Control of Power Electronic Systems

Studies modeling and control topics in power electronics. Averaged switch modeling of converters, computer simulation, ac modeling of the discontinuous conduction mode, the current programmed mode, null-double injection techniques in linear circuits, input filter design, and low-harmonic rectifiers.

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5811 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4811 and ASEN 4216 and ASEN 5216

Additional Information: Departmental Category: Bioengineering

ECEN 5813 (3) Principles of Embedded Software

Introduces principles around embedded software elements and software development needed for the Embedded Systems Engineering core curriculum. Student will write C program applications that employ efficient, high performance and robust software design techniques. Topics include bare-metal firmware, C-programming optimization and introductions to underlying embedded architecture. Sound testing and debug practices will be instilled and utilized in several application projects.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5817 (3) Resonant and Soft-Switching Techniques in Power Electronics

Covers resonant converters and inverters, and soft switching; sinusoidal approximations in analysis of series, parallel, LCC, and other resonant dc-dc and dc-ac converters; state-plane analysis of resonant circuits; switching transitions in hard-switched and soft-switched PWM converters; zero-voltage switching techniques, including resonant, quasi resonant, zero voltage transition, and auxiliary switch circuits.

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5821 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4821 and ASEN 4426 and ASEN 5426

Additional Information: Departmental Category: Bioengineering

ECEN 5823 (3) Internet of Things Embedded Firmware

Acquire firmware development skills to meet low energy and internet connectivity demands of embedded systems. Event-driven firmware techniques will be explored through programming assignments, transitioning to programming an Internet of Things RF Network Protocol such as Bluetooth Low Energy or Thread. The coursework will align with the latest industry firmware and embedded wireless protocol trends.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5827 (3) Analog IC Design

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4827

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Power

ECEN 5830 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 5831 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4831 and ASEN 5436

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Bioengineering

ECEN 5837 (3) Mixed-Signal IC Design Lab

Software laboratory course extends the concepts developed in ECEN 5827 to full design and layout of mixed analog and digital custom integrated circuits. Assignments explore implementation of analog to digital and digital to analog converters, and final project develops a full custom IC for a target application.

Requisites: Requires prerequisite course of ECEN 5827 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5840 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the master's level. Numbered ECEN 5840-5849. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 5863 (3) Programmable Logic Embedded System Design

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explore complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5907 (3) Special Topics

Special topics class.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

ECEN 6016 (1-3) Special Topics

Additional Information: Departmental Category: Optics

ECEN 6139 (3) Logic Synthesis of VLSI Systems

Studies synthesis and optimization of sequential circuits, including retiming transformations and don't care sequences. Gives attention to hardware description languages and their application to finite state systems. Also includes synthesis for testability and performance, algorithms for test generation, formal verification of sequential systems, and synthesis of asynchronous circuits.

Recommended: Prerequisites ECEN 5139 and CSCI 5454.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 6144 (3) Electromagnetic Boundary Problems

Provides mathematical and physical fundamentals necessary for the systematic analysis of electromagnetic fields problems. Covers basic properties of Maxwell's equations, potentials and jump conditions; scattering and diffraction by canonical structures; Green's functions, integral equations and approximate methods. Requires some maturity in electromagnetics.

Requisites: Requires prereq course of ECEN 5114 or 5134 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 6800 (3) Master of Engineering Report

Additional Information: Departmental Category: General

ECEN 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

ECEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 6960 (3) Master of Engineering

Additional Information: Departmental Category: General

ECEN 7438 (3) Theory of Nonlinear Systems

Nonlinear systems and control. Introduction to nonlinear phenomena: multiple equilibria, limit cycles, bifurcations, complex dynamical behavior. Planar dynamical systems, analysis using phase plane techniques. Input-output analysis and stability. Passivity. Lyapunov stability theory. Feedback linearization. Exploration of examples and applications.

Requisites: Requires prerequisite course of ECEN 5448 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 7840 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 7849 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 8990 (1-10) Doctoral Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Additional Information: Departmental Category: General

Computer Engineering - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a minor in computer engineering.

The minor in computer engineering provides training in computer engineering beyond the training usually received by science and mathematics majors. It can also broaden the training of students majoring in other engineering and applied science fields to provide more depth in computer engineering. The goal is to introduce students to the fundamentals of computer engineering and introduce them to a more advanced field. Such skills are important to students who expect to participate in real world situations that increasingly involve computer engineering solutions.

The minor is not available to students earning a Bachelor of Science degree in electrical engineering or electrical & computer engineering.

Requirements

Prerequisites

The prerequisite for these courses is computing experience such as that provided by ECEN 1310 or CSCI 1300.

Course Requirements

This minor requires a minimum of 19 credit hours.

Students admitted to the computer engineering minor must have a cumulative GPA of 2.700 or better. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

Required Courses and Credit Hours

Required Courses

CSCI 2270	Computer Science 2: Data Structures	4
ECEN 2350	Digital Logic	3
ECEN 3350	Programming Digital Systems	3
ECEN 3360	Digital Design Laboratory	3
ECEN 4593	Computer Organization	3
Emphasis Area (Choose one)		3
ECEN 4553	Compiler Construction	
ECEN 4583	Software System Development	
ECEN 4613		
ECEN 4623		
ECEN 5593	Advanced Computer Architecture	

Total Credit Hours 19

Electrical and Computer Engineering - Bachelor of Science (BS)

Program Objectives

- Graduates will be situated in growing careers involving the design, development or support of electrical, electronic and computer hardware and software systems, software engineering, devices instruments or products, or will be successfully pursuing an advanced degree.**

Graduates attaining the Electrical and Computer Engineering (ECE) BS degree will have comprehensive knowledge and experience in the concepts and design of electrical, electronic and computer devices, circuits and systems. Besides emphasizing computer hardware and software, the ECE curriculum also emphasizes design, integration, implementation and application of computer systems, as well as experience in software development. This is achieved through a sequence of required courses in these areas, culminating in a major design project incorporating realistic engineering constraints. The curriculum also provides opportunities for specialization in areas such as compiler design, embedded systems, software engineering, and VLSI design, as well as in the electrical engineering specialties. ECE graduates will have attained other professional skills that will be useful throughout their careers, including verbal and written communication, and the ability to function on multidisciplinary teams. The ECE curriculum is rich in laboratory work. ECE graduates will have achieved extensive practical experience in the laboratory techniques, tools and skills that provide a bridge between theory and practice.
- Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.**

ECE graduates experience a curriculum that contains a broad core of classes focused on mathematical and physical principles that are fundamental to the fields of electrical and computer engineering. Hence, they understand the physical and mathematical principles underlying electrical and electronic technology, and computer systems, and are able to analyze and solve electrical and computer engineering problems using this knowledge. In addition to basic classes in mathematics, science, and computing, the ECE curriculum includes a sequence of courses in analog and digital electronic circuits and systems, electromagnetic fields, probability, computer software, and computer design and architecture.
- Graduates will have demonstrated professional and personal leadership and growth.**

To lay the foundation of a long career in a rapidly changing field, a broad background of fundamental knowledge is required. This is achieved in the ECE curriculum through a sequence of required classes in mathematics, physics, chemistry, and the ECE core. In addition, the graduate must be capable of lifelong learning; this is taught through assignments and projects that require independent research and study. The curriculum includes a significant component of electives in the humanities and social sciences. ECE graduates will have knowledge of the broader contemporary issues that impact engineering solutions in a global and societal context. They will have the verbal and written communications skills necessary for a successful career in industry or academia. Graduates also understand the meaning and importance of professional and ethical responsibility.

Outcomes

The ECE curriculum is designed to prepare our graduates to meet these as follows:

- an ability to apply knowledge of mathematics, science, and engineering
- an ability to design and conduct experiments, as well as to analyze and interpret data
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- an ability to function on multidisciplinary teams
- an ability to identify, formulate, and solve engineering problems
- an ability to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- a recognition of the need for, and an ability to engage in life-long learning
- a knowledge of contemporary issues
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Concurrent Degree Program

BS/MS in Electrical & Computer Engineering and Electrical Engineering

The concurrent BS/MS program enables especially well qualified electrical & computer engineering majors to be admitted to the MS program during the junior year of their BS program, and to work simultaneously toward their BS degree along with an MS in electrical engineering. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of the BS degree, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit-hour load.

For more information, visit the department's BS/MS Degrees (<http://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) webpage.

Requirements

The following information represents a sample 8-semester sequence of study only. Up-to-date curricular information and policies are contained in the *ECEE HELP Guide*.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
ECEN 1100	Freshman Seminar	1
ECEN 1400	Introduction to Digital and Analog Electronics	3

PHYS 1110	General Physics 1	4
Humanities/social sciences elective ¹		3
		Credit Hours 15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
ECEN 1310	C Programmin for ECE	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimenta Physics 1	1
Humanities/social sciences elective ¹		3
		Credit Hours 16
Year Two		
Fall Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
ECEN 1030	Special Topics (Special Topics - MATLAB Programmin	1
ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 24XX Sophomore Elective 1		3
ECEN 2703	Discrete Mathematics for Computer Engineers	3
Humanities/social sciences elective ¹		3
		Credit Hours 17
Spring Semester		
APPM 2350	Calculus 3 for Engineers	4
ECEN 2260	Circuits as Systems	3
ECEN 2270	Electronics Design Lab	3
ECEN 2350	Digital Logic	3
General science elective		3
		Credit Hours 16
Year Three		
Fall Semester		
CSCI 2270	Computer Science 2: Data Structures	4
ECEN 3350	Programming Digital Systems	3

ECEN 3810	Introduction to Probability Theory	3
ECEN 3XXX Analog Elective		3
Humanities/social sciences elective ¹		3
	Credit Hours	16
Spring Semester		
ECEN 3360	Digital Design Laboratory	3
ECEN 4593	Computer Organization	3
ECEN 3XXX Analog Elective		3
Technical electives		6
College-approved writing course ²		3
	Credit Hours	18
Year Four		
Fall Semester		
Capstone, Part 1		3
Technical electives		7
Free electives		5
	Credit Hours	15
Spring Semester		
Capstone, Part 2 (minimum grade of C- required)		3
Software elective		3
Technical elective		3
Humanities/social sciences elective ¹		3
Free elective		3
	Credit Hours	15
	Total Credit Hours	128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Electrical Engineering - Bachelor of Science (BS)

A degree in electrical engineering provides graduates the opportunity to enter the profession of engineering and to engage in work as a design, production, testing, consulting, research, teaching, or management professional in a wide variety of careers in the computer industry, telecommunications, instruments, the power and renewable energy industry, the biomedical industry, aerospace, and academia. Some graduates also go on to develop careers in other professions like law and medicine.

Examples of career opportunities include development of new electrical or electronic devices, instruments or products; design of equipment or systems; production and quality control of electrical products for private industry or government; sales or management for a private firm or government; and teaching and research in a university.

Program Objectives

Graduates will be situated in growing careers involving the design, development or support of electrical or electronic systems, devices, instruments, or products, or will be successfully pursuing an advanced degree.

Graduates attaining the Electrical Engineering (EE) BS degree will have comprehensive knowledge and experience in the concepts and design of electrical and electronic devices, circuits, and systems. This is achieved through a sequence of required courses in these areas, culminating in a major design project incorporating realistic engineering constraints.

Moreover, graduates will have advanced, specialized knowledge and skills in elective areas such as communications and digital signal processing, control systems, analog and digital integrated circuit design, semiconductor devices and optoelectronics, electromagnetics and wireless systems, power electronics, renewable energy, bioelectronics, and digital systems.

EE graduates will have attained other professional skills that will be useful throughout their careers, including verbal and written communication and the ability to function on multidisciplinary teams.

The EE curriculum is rich in laboratory work. EE graduates will have achieved extensive practical experience in the laboratory techniques, tools, and skills that provide a bridge between theory and practice.

Graduates will have advanced in professional standing based on their technical accomplishments and will have accumulated additional technical expertise to remain globally competitive.

EE graduates experience a curriculum that contains a broad core of classes focused on mathematical and physical principles that are fundamental to the field of electrical engineering. Hence, they understand the physical and mathematical principles underlying electrical and electronic technology, and are able to analyze and solve electrical engineering problems using this knowledge. In addition to basic classes in mathematics, science, and computing, the EE curriculum includes a sequence of courses in analog and digital electronic circuits and systems, and electromagnetic fields.

Graduates will have demonstrated professional and personal leadership and growth.

To lay the foundation for a long career in a rapidly changing field, a broad background of fundamental knowledge is required. This is achieved in the EE curriculum through a sequence of required courses in mathematics, physics, chemistry, and the EE core. In addition, the graduate must be capable of lifelong learning; this is taught through assignments and projects that require independent research and study.

The curriculum includes a significant component of electives in the humanities and social sciences. EE graduates will have knowledge of the broader contemporary issues that impact engineering solutions in a global and societal context. They will have the verbal and written communication skills necessary for a successful career in industry or academia. Graduates also understand the meaning and importance of professional and ethical responsibility.

Outcomes

- an ability to apply knowledge of mathematics, science, and engineering

- an ability to design and conduct experiments, as well as to analyze and interpret data
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- an ability to function on multidisciplinary teams
- an ability to identify, formulate, and solve engineering problems
- an ability to communicate effectively
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- a recognition of the need for, and an ability to engage in life-long learning
- a knowledge of contemporary issues
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Concurrent Degree Program BS/MS in Electrical Engineering

The concurrent BS/MS program enables especially well qualified electrical engineering majors to be admitted to the MS program during the junior year of their BS program, and to work simultaneously toward their BS degree along with an MS in electrical engineering. This program allows for early planning of the MS portion of the student’s education, taking graduate courses as part of the BS degree, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit-hour load.

For more information, visit the department’s BS/MS Degrees (<http://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) webpage.

Requirements

The following information represents a sample 8-semester sequence of study only. Up-to-date curricular information and policies are contained in the *ECEE HELP Guide*.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
ECEN 1100	Freshman Seminar	1
ECEN 1400	Introduction to Digital and Analog Electronics	3
PHYS 1110	General Physics 1	4
Humanities/social sciences elective ¹		3
	Credit Hours	15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4

ECEN 1310	C Programmin for ECE	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimenta Physics 1	1
Humanities/social sciences elective ¹		3
	Credit Hours	16

Year Two Fall Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
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ECEN 1030	Special Topics (Special Topics - MATLAB Programmin	1
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ECEN 24XX Sophomore Elective 1		3
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ECEN 2250	Introduction to Circuits and Electronics	3
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ECEN 2350	Digital Logic	3
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Humanities/social sciences elective ¹		3
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	Credit Hours	17
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Spring Semester

APPM 2350	Calculus 3 for Engineers	4
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ECEN 24XX Sophomore Elective 2		3
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ECEN 2260	Circuits as Systems	3
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ECEN 2270	Electronics Design Lab	3
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General science elective		3
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	Credit Hours	16
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Year Three

Fall Semester

ECEN 3350	Programmin Digital Systems	3
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ECEN 3810	Introduction to Probability Theory	3
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ECEN 3XXX Analog Elective 1		3
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ECEN 3XXX Analog Elective 2		3
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Humanities/social sciences elective ¹		3
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	Credit Hours	15
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	Credit Hours	15
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	Credit Hours	15
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	Credit Hours	15
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	Credit Hours	15
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	Credit Hours	15
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Free elective	3		
		Credit Hours	18
Year Four			
Fall Semester			
Capstone, Part 1	3		
Technical electives	8		
Free electives	5		
		Credit Hours	16
Spring Semester			
Capstone, Part 2 (minimum grade of C- required)	3		
Technical electives	9		
Humanities/social sciences elective ¹	3		
		Credit Hours	15
		Total Credit Hours	128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Electrical Engineering - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a minor in electrical engineering (except for students earning a BS degree in Electrical Engineering or Electrical & Computer Engineering).

The minor in electrical engineering provides training in electrical engineering beyond the training usually received by science, mathematics and applied mathematics majors. It can also broaden the training of students majoring in other engineering fields to provide more depth in electrical engineering. The goal is to teach students the fundamentals of electrical engineering and introduce them to at least one of its many advanced application areas. Such skills are important to students who expect to participate in real world situations that increasingly involve electrical engineering applications.

Requirements

Prerequisites

Prerequisites for the Electrical Engineering Minor are two semesters of calculus and differential equations with linear algebra. A grade of C- or better is required in all prerequisite courses.

Course Requirements

This minor requires a minimum of 18 credit hours.

Students admitted to the Electrical Engineering Minor must have a cumulative GPA of 2.700 or better. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

Required Courses and Semester Credit Hours

Required Courses

ECEN 2250	Introduction to Circuits and Electronics	3
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ECEN 2260	Circuits as Systems	3
ECEN 2270	Electronics Design Lab	3

Emphasis Areas (complete 9 credits in one of the following emphasis areas) 9

Bioengineering (all 3 courses are required)

ECEN 4011	Special Topics (Topic: Design of Implantable Medical Devices)	3
ECEN 4021	Special Topics (Topic: Engineering Application in Medicine)	3
ECEN 4341	Bioelectromagnetics	3

Computer Engineering (all 3 courses are required)

ECEN 2350	Digital Logic	3
ECEN 3350	Programming Digital Systems	3
ECEN 3360	Digital Design Laboratory	3

Electronics (choose 3 courses)

ECEN 3250	Microelectronics	3
ECEN 3320	Semiconductor Devices	3
ECEN 3170	Electromagnetic Energy Conversion 1	3
ECEN 4797	Introduction to Power Electronics	3
ECEN 4827	Analog IC Design	3

Fields, Waves and Photonics (all 3 courses are required)

ECEN 3400	Electromagnetic Fields and Waves	3
ECEN 3410	Electromagnetic Waves and Transmission	3
ECEN 4106	Photonics	3

Nanostructures and Devices (all 3 courses are required)

ECEN 3320	Semiconductor Devices	3
ECEN 4005	Special Topics - Photovoltaic Devices	

ECEN 4555	Principles of Energy Systems and Devices	3
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Signals and Systems (choose 3 courses)

ECEN 3300	Linear Systems	3
ECEN 4138	Control Systems Analysis	3
ECEN 4242	Communication Theory ¹	3
ECEN 4632	Introduction to Digital Filtering	3

¹ Requires one of the following courses in probability: ECEN 3810, APPM 3570 or MATH 4510.

Electrical Renewable Energy Systems - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a minor in electrical renewable energy systems (except for students earning a BS degree in Electrical Engineering or Electrical & Computer Engineering).

As society moves away from the overwhelming dependence on fossil fuels towards more sustainable and environmentally friendlier alternatives, the need for engineers and scientists ready to take on new challenges and bring innovations to present and future energy systems is expected to grow. The objectives of the minor in electrical renewable energy systems are to address the growing interests and technical needs in renewable energy sources and efficient utilization of electrical energy. The minor provides training in applications of electrical engineering to renewable energy systems such as solar and wind beyond the training

usually received by science, mathematics, applied mathematics or other engineering majors.

Requirements

Prerequisites

Prerequisites for the Electrical Renewable Energy Systems Minor are two semesters of calculus and differential equations with linear algebra.

Course Requirements

This minor requires a minimum of 18 credit hours.

Students admitted to the Electrical Renewable Energy Systems Minor must have a cumulative GPA of 2.700 or better. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

Required Courses and Semester Credit Hours

Required Courses

ECEN 2410	Renewable Sources and Efficient Electrical Energy Systems	3
ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 2260	Circuits as Systems	3
ECEN 3250	Microelectronics	3

Upper-Division Electives

Select two of the following courses:

ECEN 3170	Electromagnetic Energy Conversion 1	
ECEN 4167	Electromagnetic Energy Conversion 2	
ECEN 4797	Introduction to Power Electronics	
ECEN 4517	Power Electronics and Photovoltaic Power Systems Laboratory	
ECEN 4XXX	Special Topics - Wind Energy & Photovoltaic Devices	

Total Credit Hours 18

Signals and Systems - Minor

A student graduating with a bachelor's degree from CU Boulder may also receive a Minor in Signals and Systems (except for students earning a BS degree in Electrical Engineering or Electrical & Computer Engineering).

The Minor in Signals and Systems provides training in control systems, digital signal processing or communications beyond the training usually received by science, mathematics and applied mathematics majors. It can also broaden the training of students majoring in other engineering fields to provide depth in signals and systems. The goal is to teach students the fundamentals of signals and systems and introduce them to laboratory applications.

Requirements

Prerequisites

Prerequisites for the Signals and Systems Minor are General Physics 2 (PHYS 1120) and a solid mathematics background in Fourier series, Laplace transforms, transfer functions and sinusoidal response. The probability prerequisite may be met with ECEN 3810, APPM 3570, MATH 4510 or an equivalent transfer course. A grade of C- or better is required in all prerequisite courses.

Course Requirements

This minor requires a minimum of 18 credit hours.

Students admitted to the Signals and Systems Minor must have a cumulative GPA of 2.700 or better. A cumulative GPA of 2.250 or better is required for courses used to satisfy the requirements of this minor. Each individual course that is counted toward this minor must be passed with a grade of D- or better (note that a C- or better grade is required in all prerequisite courses).

Required Courses and Semester Credit Hours

Required Courses

ECEN 2250	Introduction to Circuits and Electronics	3
ECEN 2260	Circuits as Systems	3
ECEN 3300	Linear Systems	3

Electives

Choose the remaining 9 credits from any combination of the following theory and lab courses:

ECEN 3350	Programming Digital Systems	
ECEN 4138	Control Systems Analysis	
ECEN 4638	Control Systems Laboratory	
ECEN 4242	Communication Theory	
ECEN 4652	Communication Laboratory	
ECEN 4532	Digital Signal Processing Laboratory	
ECEN 4632	Introduction to Digital Filtering	

Students may petition to replace three of these credit hours with a 3-credit hour, 5000-level ECEN course in digital signal processing, communications or controls.

Engineering and Applied Science

Interdisciplinary programs managed by the College (<http://www.colorado.edu/engineering>) are included here. The listing of courses includes interdisciplinary courses as well as those offered by the Engineering Honors Program (<http://www.cuhonorsengineering.com>) and the Herbst Program of Humanities for Engineers (<http://www.colorado.edu/herbst>).

Minor

- Biomedical Engineering - Minor (p. 719)
- Energy Engineering - Minor (p. 720)
- Global Engineering - Minor (p. 721)

Certificate

- Engineering Leadership - Certificate (p. 720)
- Engineering, Science and Society - Certificate (p. 720)
- Lighting Design - Certificate (p. 722)

BMEN 2000 (3) Introduction to Biomedical Engineering

Reviews important aspects of biology and develops a basic understanding of the biomedical engineering field. Topics include physiological principles, biomechanics, bioinstrumentation, bioimaging, biotechnology and biomaterials.

Requisites: Restricted to Biomedical Engineering minors only.

Recommended: Prerequisite high school biology.

Grading Basis: Letter Grade

COEN 1236 (1) Precalculus Work Group

Develops and enhances problem solving skills for students enrolled in APPM 1235. Course is conducted in a collaborative learning environment with students working in groups under the guide of a facilitator.

Requisites: Requires enrollment in corequisite course of APPM 1235.

Grading Basis: Pass/Fail

COEN 1350 (1) Calculus 1 Work Group

Provides problem-solving assistance to students enrolled in APPM 1350. Student groups work in collaborative learning environment. Student participation is essential.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires enrollment in corequisite course of APPM 1350 or APPM 1345.

Grading Basis: Pass/Fail

COEN 1360 (1) Calculus 2 Work Group

Provides problem solving assistance for students enrolled in APPM 1360. Conducted in a collaborative learning environment. Student work groups solve calculus problems with assistance of facilitator.

Requisites: Requires enrollment in corequisite course of APPM 1360.

Grading Basis: Pass/Fail

COEN 1400 (3) Project Design

Teams of first-year students solve real engineering design problems. Curriculum focuses on iterative design process, teamwork and team dynamics, supporting design with testing and analysis and technical writing.

Requisites: Restricted to students with 0-75 units completed and restricted to Pre-Engineering (PREN-COS) students only.

COEN 1500 (1) Introduction to Engineering

Provides an introduction to the engineering profession, including an examination of current discipline specializations and a focus on career paths for those trained in engineering. Provides sufficient knowledge of the engineering disciplines necessary to make an informed major choice.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering or Pre-Engineering Arts and Sciences majors only.

COEN 1510 (1) Self Management and Leadership Principles 1

Prepares freshmen in their transition to college. Focuses on academic success strategies, time and stress management, study skills, and S.M.A.R.T. goal setting. Students identify their strengths and participate in peer-to-peer interaction to foster collaboration and positive behavior. Leadership capabilities, professional development, and insights into career interests are explored. Speakers provide students with unique insights into being successful students and engineers.

Requisites: Restricted to Engineering Goldshirt (PENG) students only.

COEN 1520 (1) Self Management and Leadership Principles 2

Continuation of COEN 1510. Self-management and student development is reiterated. Includes time and stress management, study skills and S.M.A.R.T. goal setting for the "master" student. Leadership explored through group projects. Students complete professional development activities and assignments geared toward preparing students for engineering internships and research opportunities. Advising on different engineering department provided to support major selection and course scheduling.

Requisites: Requires prerequisite course of COEN 1510 (minimum grade C-). Restricted to Engineering Goldshirt (PENG) students only.

COEN 1550 (1) YOU'RE@CU: Undergraduate Career Seminar

Exposes first or second year undergraduate students to engineering research careers through a partner program (YOU'RE@CU), panel discussions with researchers in academics and industry, and exposure to research labs. Restricted to YOU'RE@CU participants. Department consent required.

Grading Basis: Pass/Fail

COEN 2050 (3) Engineering Leadership Gateway

Examines concepts of engineering leadership and the essential skills required to become an effective leader. Together students will explore leadership principles, creative and critical thinking, interpersonal skills (e.g. collaboration, conflict resolution, leading in diverse communities), intrapersonal development (e.g. self-appraisal, reflective practice, personal leadership philosophy), organizational competencies (e.g. planning, sustainability, climate), effective communication and ethical decision-making. Fulfills Engineering humanities/social science requirements.

Requisites: Restricted to Engineering Leadership Program (PENL) students only.

COEN 2350 (1) Calculus 3 Work Group

Provides problem solving assistance to students enrolled in APPM 2350. Conducted in a collaborative learning environment. Student work groups solve calculus problems with the assistance of a facilitator.

Requisites: Requires enrollment in corequisite course of APPM 2350.

Grading Basis: Pass/Fail

COEN 2500 (1) Industry 101: Technical Career and Professional Development

Connects students to the world of technical work, helping them gain an understanding of themselves and develop a unique, professional identity. Knowledge will be gained about how to research various industries and how to make an informed decision about career paths. Structured lessons will be incorporated that will cover resumes, interview preparation, communication skills, proper professional etiquette and employer expectations, self-exploration and connections with industries.

Grading Basis: Letter Grade

COEN 2830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 2850 (1-3) Independent Study

Provides opportunities for independent study at the lower-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 3050 (3) Complex Leadership Challenges

Approaches leadership as a process of inquiry, empathy, and action, cultivating skills leaders need to understand, communicate about, and generate innovative approaches to complex issues. Each student conducts extensive, principled research about a complex social issue of their choice, investigating its multidimensionality by applying different analytic lenses. Instructor consent required for students not in Engineering Leadership.

Requisites: Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3051 (1) Leadership Seminar 1: Launching the Leadership Experience

Practicing needs assessment, decision-making and planning skills, students take this seminar to prepare for their Leadership Experience (required for completion of the Engineering Leadership Certificate). Students work in collaboration with each other, their Engineering Leadership Program mentors and campus/community organizations and leaders to lay the foundation for and launch their individually unique Leadership Experiences.

Requisites: Requires a prerequisite course of COEN 2050 (minimum grade C-). Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3052 (1) Leadership Seminar 2: Leadership Experience

Tackling a leadership experience of their own design, students undertake a key component of the Engineering Leadership Program experience and a requirement for the completion of the Engineering Leadership Certificate. Guides students through a process of planning, executing and evaluating their leadership experience and progress toward personalized leadership development goals. Coursework involves working with a mentor, collaborating with peers and conducting research.

Requisites: Requires a prerequisite course of COEN 2050 (minimum grade D-). Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3053 (1) Leadership Seminar 3: ELP Synthesis and Final ePortfolio

Progressing through this course, students complete the ePortfolio that demonstrates fulfillment of the requirements of the Engineering Leadership Certificate, reflecting upon synthesizing and discerning practical applications of the leadership experiences tackled throughout throughout their time at CU.

Requisites: Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3930 (6) Engineering Co-op

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program with a university, government agency, or industry. Offered only through Continuing Education. 00 GPA or higher.

Repeatable: Repeatable for up to 24.00 total credit hours.

Requisites: At least a 2.75 cumulative GPA is required. Restricted to College of Engineering majors only.

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

COEN 4830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 4850 (1-3) Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 4950 (1-6) Global Engineering Internship

Gives students the opportunity to pursue studies in engineering-related work experience projects abroad that allow them to explore the relationship between theory and practice in their major. Internships generally require 40 hours on the job per credit hour and evidence of significant learning (e.g., paper, final project and employer evaluations). Does not count toward degree requirements.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

EDEN 5001 (3) Special Topics in Development Engineering

At the graduate level, covers topics of interest in development, for both domestic and international locations. Content varies by section and from semester to semester.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

EHON 1151 (3) Critical Encounters

Explores critical, literary and philosophical approaches to the following related problems: 1) how we organize knowledge and construct meaning, and 2) how we locate a sense of self as both individuals and members of various groups amidst the resources and demands of competing interpretations, traditions challenges and circumstances. Department restriction, honors standing or instructor consent required.

Requisites: Restricted to Engineering Honors Program (PEHN) students only.

EHON 1500 (1) Honors Reading Group

Faculty led reading seminars, focusing on specific text or texts chosen by the faculty. Special attention will be paid to group formation and the process of collaborative learning.

Requisites: Restricted to Engineering Honors Program (PEHN) students only.

Additional Information: Engineering Honors Course

EHON 3843 (3) Special Topics

Explores different important themes relative to the Engineering Honors Program. Check with department for specific semester topics.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Engineering Honors Program (PEHN) students only.

Additional Information: Engineering Honors Course

EHON 4051 (1) Dimensions of Leadership

Explores the many dimensions of leadership that exceed technical knowledge: the ethical, societal, cultural, interpersonal, and personal. Through seminars, workshops and exposure to leaders, students will reflect upon their engineering education in light of the multifaceted demands of effective leadership and their own personal career goals. Students will take an active role in shaping the course. Department restriction, honors standing or instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ENEN 2820 (1-6) Special Topics

Explores topics related to energy engineering. Content will vary by semester and instructor.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

ENEN 4321 (3) Oil and Gas Processing

Provides a foundation in the fundamentals of oil and gas processing, including discovery, extraction and refining. Due to the importance of oil and gas in the current energy infrastructure, this course provides a broad understanding of the industry to students interested in energy engineering.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

ENEN 4600 (3) Interdisciplinary Energy Engineering Projects

Prepares students to analyze energy systems from technical, economic, and policy perspectives, with project topics varying by semester. Provides historical and contemporary context of the energy landscape. Emphasizes application of engineering fundamentals for the design and evaluation of real world energy systems. Projects will be completed in interdisciplinary teams.

Requisites: Requires preprerequisite courses of ENVS 3621 and CHEN 3660 (all minimum grade C). Restricted to Energy Engineering Minor (ENMR-MIN) majors only.

Grading Basis: Letter Grade

ENEN 4840 (1-6) Special Topics

Explores topics related to energy engineering. Content will vary by semester and instructor.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 1010 (3) Humanities for Engineers

Explores a wide variety of challenging and interesting humanistic themes (love, responsibility, ambition, etc.) in many forms (fiction, philosophy, plays, poetry, art, music, etc.). In small discussion-based classes, emphasizes the writing, public speaking and critical thinking skills needed to excel as a professional engineer. Fulfills College of Engineering writing requirement for first-year freshmen only.

Requisites: Restricted to students with 0-26 (Freshmen) College of Engineering majors only.

HUEN 1843 (3) Special Topics

Explores different important themes in the humanities; check with the department for specific semester topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Engineering majors only.

HUEN 1850 (3) Engineering in History: The Social Impact of Technology

Explores how engineering has shaped who we are, how we think, and what we think about, by examining preconceived notions of progress, property, time, and work. Textbook readings plus original sources in philosophy, literature, psychology, and economics provide a rich and stimulating tour of engineering history.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

HUEN 2010 (3) Tradition and Identity

Explores the place and possibility of personal identity both within and against the influence of tradition, including family, culture, language, and social, political and economic institutions. Via literature and film, wrestles with the nature of freedom, self-determination, and belonging.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2020 (3) The Meaning of Information Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval.

Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 2000

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2100 (3) History of Science and Technology to Newton

Spans invention and discovery from the Stone Age to the age of Newton, raising questions about culture, history, and personal expectation; studies Pyramids, odometers, cathedrals, Galileo, etc., on the way.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2120 (3) History of Modern Science from Newton to Einstein

Surveys the great discoveries and theoretical disputes from Newtonian celestial mechanics to the theory of relativity. Includes physics, astronomy, chemistry, geology, and biology; closely examines scientific method, evolution, light and quantum theory. Uses original sources by Newton, Faraday, Lavoisier, Darwin, etc., for immediate contact with the great minds in science.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2130 (3) History of Modern Technology from 1750 to the Atomic Bomb

Surveys the great innovations from the Steam Age to the Atomic Age: transportation, modern construction, communications, internal combustion, etc. Supplements textbook accounts with drawings, patents, and original selections by Edison, Carnegie, Tesla, Bell, etc. Studies the sociological impact of social change via contemporary sources in literature, philosophy, painting and film.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2210 (3) Engineering, Science, and Society

Explores challenges that engineering and science pose for society plus the ways that societies shape or impede science and engineering. Case studies range from contemporary issues (global warming, nuclear weapons, and genetic engineering) to classic cases (the execution of Socrates). Core texts in the Western Tradition supplement contemporary articles and films.

Requisites: Restricted to College of Engineering majors only.

HUEN 2843 (1-3) Special Topics

Explores different important themes in the humanities; check with the department for specific semester topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 3100 (3) Advanced Humanities for Engineers

Explores what it means to be a fully human being: through group discussion, closely examines individual works of culturally and historically significant philosophy, literature and art. Includes extensive writing. Fulfills the College of Engineering & Applied Science writing requirement. Department prerequisite: a minimum GPA of 3.0.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

HUEN 3200 (3) Humanities for Engineers 2

Continues HUEN 3100's discussion of the human condition by exploring culturally and historically significant works of multiple genres in small-group seminars. Alert class participation is required, and writing skills will be honed through regular assignments.

Requisites: Requires prerequisite course of HUEN 3100 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

HUEN 3350 (3) Gods, Heroes and Engineers: The Western Quest for Excellence

Investigates the intensely competitive quest of the ancient Greeks for excellence in everything from art and literature to science and war and also the odyssey of the mind generated by this quest, culminating in our modern world.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

Grading Basis: Letter Grade

HUEN 3430 (3) Ethics of Genetic Engineering: A Multidisciplinary Approach

Investigates the metaphorical, ideological and scientific constructs that inform debates over the genetic modification of humans, animals and plants. Begins with a close reading of Shelley's *Frankenstein*, proceeds to a consideration of philosophical arguments for and against human modification and concludes with a consideration of the scientific and political contexts that inform the regulation of genetically modified foods.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

HUEN 3700 (3) Culture Wars in Rome

Investigates in Rome, Italy (during Maymester), the cultural contrasts among three different cities: ancient, pagan, aristocratic Rome; medieval, Christian, theocratic Rome; and modern, secular, democratic Rome.

Draws on evidence from Roman literature, politics, art and architecture. Must have completed a minimum of 26 credit hours by start of course. Requires some preparatory work in Boulder.

Repeatable: Repeatable for up to 6.00 total credit hours.

HUEN 3750 (3) Xi'an, China: Self-Awareness and Images of the Other

Explores Chinese culture abroad, focusing on ideas of self and other within special historical, social, political and economical circumstances. Chinese and American concepts of self and society, of individual, collective and national identities will be analyzed. Held on the campus of Xi'an Jiaotong University, China.

Requisites: Requires prerequisite course of HUEN 1010 (minimum grade D-).

Additional Information: Departmental Category: Asia Content

HUEN 3840 (1-3) Independent Study

Offers an opportunity for students to do independent work in the humanities. Subject arranged to fit the needs of the student. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) College of Engineering students only.

HUEN 3843 (1-3) Special Topics

Explores different important themes in the humanities, check with department for specific semester topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

HUEN 4200 (3) Humanities for Engineers 4

Provides opportunity to pursue a variety of humanistic themes related to Herbst Humanities Program.

HUEN 4800 (1) Leadership & Ethics in the Real World

Biomedical Engineering - Minor

The biomedical engineering minor is open to undergraduate students rostered in the College of Engineering and Applied Science who are interested in an exciting, multidisciplinary field that lies at the interface of medicine, biology and engineering.

Already, there are many approved products and applications of the biomedical engineering field. These include pharmaceutical drugs, prosthetics (replacement limbs and stents) and bioprosthesis (e.g., heart valve replacements), drug delivery and other implantable devices, and medical imaging techniques (X-ray, CT, MRI and fluoroscopy).

Current research in the biomedical engineering field is focusing on the use of biologics and genetically modified organisms for the treatment of cell- and gene-based diseases. Because of its diverse nature, the biomedical engineering field will continue to call upon individuals with backgrounds in computer science and mechanical, chemical and electrical engineering.

For more information, visit the college's Minor in Biomedical Engineering (<http://www.colorado.edu/engineering/minor-biomedical-engineering>) webpage.

Requirements

Students must complete 18 credit hours (6 courses) for the minor.

- BMEN 2000 Introduction to Biomedical Engineering (3 credit hours)
- Five elective courses (15 credit hours)

At least four of the five elective courses (see a complete listing of elective courses on the Minor in Biomedical Engineering (<http://www.colorado.edu/engineering/minor-biomedical-engineering>) webpage)

must be upper-division (3000 level or higher). One course can be petitioned to come from outside engineering with preapproval, relevant independent study course work can be petitioned and 5000-level courses are allowed where undergraduate students are eligible to enroll.

Prior coursework may be transferred from other institutions with approval. At least three courses need to be taken on the CU Boulder campus. At least two of these three courses have to be at the upper division. Two of the six courses for the minor may not be applied toward BS degree requirements.

Energy Engineering - Minor

The energy engineering minor provides energy-minded students with a foundational understanding of energy technologies and the energy industry, including technological, policy, and economic considerations related to conventional and renewable energy systems.

Required courses include energy fundamentals, energy policy and society, and an interdisciplinary energy projects course which focuses on the performance and economics of energy systems. Elective courses, selected from across the CU campus, allow students to specialize according to their specific interest in the energy field.

The energy engineering minor has strong connections with industry through an industry advisory panel and guest speakers.

For more information, visit the college's Energy Engineering Minor (<http://www.colorado.edu/engineering/energy-engineering-minor>) webpage.

Requirements

Students must complete 18 credit hours for the minor:

- CHEN 3660 Energy Fundamentals
- ENVS 3621 Energy Policy and Society
- ENEN 4600 Interdisciplinary Energy Engineering Projects
- Three elective courses (9 credit hours)

See a complete listing of elective courses on the Energy Engineering Minor (<http://www.colorado.edu/engineering/energy-engineering-minor>) webpage.

Engineering Leadership - Certificate

The Engineering Leadership Program (<http://www.colorado.edu/engineeringleadershipprogram>) (ELP) provides engineering students with course work and active learning experiences to prepare them to be leaders in their chosen careers, whether it is in an engineering field or another field such as government service, law, medicine, etc. ELP is comprised of a number of elements designed to give engineering students a well-rounded and robust leadership education that is complementary to their potential career paths. Students in the program take leadership courses through ELP and other CU programs, attend leadership seminars sponsored by the college and learn from mentors who have experience relevant to their interests. ELP Students also design and undertake a personal leadership experience and produce a portfolio of their ELP work for review prior to graduation. Students apply to the program in their first or second year.

New first-year students are introduced to ELP through the non-credit "Taste of ELP" offered each fall. Taste of ELP is a series of 1-hour

seminars that introduce students to the components of ELP. After participating in ELP, students are formally accepted into the program.

Students entering the Engineering Leadership Program in Fall 2017 are required to take a total of 9 credit hours in leadership, project management, and/or global perspectives. The first course to be taken is the Engineering Leadership Gateway, COEN 2050. Students then take an additional sequence of 1-credit hour courses, generally one course per academic year, before graduation. These 1-credit courses help the students select, plan, and undertake their leadership experiences. Students select additional elective courses to complete their required 9 credit hours.

In addition to the 9 credit hours, all ELP students undertake a self-defined leadership experience, participate in leadership seminars, work with mentors, and document their ELP work in an ELP Portfolio.

Students can apply to ELP by participating in Taste of ELP (<http://www.colorado.edu/engineeringleadershipprogram/program-elements/taste-elp-calendar-events>) or by applying to the program through the college's Engineering Leadership Program (<http://www.colorado.edu/engineeringleadershipprogram>) website.

Engineering, Science and Society - Certificate

The Certificate in Engineering, Science, and Society (ESS) leads students to courses that will engage them with contemporary issues regarding the promotion, use, and possible risks of engineering and applied science. For example, what are the likely benefits and risks of genetic engineering? How can engineering help offset world-wide environmental degradation? What role should engineers play in formulating policies that will govern the relationship between science and contemporary American society?

The ESS Certificate includes a cornerstone course that explores these philosophical questions (and others related to them). The Certificate also steers students toward other courses that address these difficult questions and will help them find a path toward workable answers. The list of possible courses includes:

- Courses which view engineering in social, economic, and legal contexts;
- Courses which study science and technology in the past, thereby illuminating their influence in the present;
- Courses which explore the environmental consequences of STEM innovation.

Requirements

To begin the certificate, students must:

- Be in good academic standing in the College of Engineering and Applied Science
- Complete a certificate enrollment with Paul Diduch of the Herbst Program

To complete the certificate, students must:

- Complete the cornerstone course, HUEN 2210, with a minimum grade of C+
- Complete four other approved courses (<http://www.colorado.edu/herbst/certificate-option>), with a minimum grade of C+

- Complete at least one of these courses at the 3000-level or above
- Submit a certificate completion form to the director

Approved Courses

The list of courses approved for the certificate is provided below. It includes both lower-division and upper-division courses.

HUEN 1850	Engineering in History: The Social Impact of Technology
HUEN 2020	The Meaning of Information Technology
HUEN 2100	History of Science and Technology to Newton
HUEN 2120	History of Modern Science from Newton to Einstein
HUEN 2130	History of Modern Technology from 1750 to the Atomic Bomb
HUEN 2843	Special Topics
HUEN 3350	Gods, Heroes and Engineers: The Western Quest for Excellence
HUEN 3430	Ethics of Genetic Engineering: A Multidisciplinary Approach
HUEN 3843	Special Topics
ASEN 3046	Introduction to Humans in Aviation
ATLS 2000	The Meaning of Information Technology
GEEN 1100	
GEEN 3300	
CHEN 1000	
CVEN 4700	
CVEN 5373	Water Law, Policy, and Institutions
CVEN 5393	Water Resources System and Management
TLEN 5120	
ANTH 4500	Cross-Cultural Aspects of Socioeconomic Development
ANTH 4600	
ASTR 4800	Space Science: Practice and Policy
ATOC 4800	Policy Implications of Climate Controversies
BAKR 1600	Creating a Sustainable Future
COMM 1210	Perspectives on Human Communication
EBIO 3040	Conservation Biology
EBIO 3180	Global Ecology
EBIO 4180	
ECON 3535	Natural Resource Economics or ECON 45 Environmental Economics
ECON 3545	Environmental Economics or ECON 45 Environmental Economics
ENVD 2001	Human Behavior in Design and Planning
ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings
ENVS 1000	Introduction to Environmental Studies
ENVS 3140	Environmental Ethics
ENVS 3621	Energy Policy and Society
ENVS 5000	Policy, Science, and the Environment
ENVS 5810	Water Resources and Environmental Sustainability
ENVS 5820	Energy Policy in the 21st Century
GEOG 3412	Conservation Practice and Resource Management

GEOG 3422	Political Ecology
GEOG 3682	Geography of International Development
GEOG 4430	Seminar: Conservation Trends
GEOG 4501	Water Resources and Water Management of Western United States
GEOG 5772	
GEOL 3500	
GEOL 3520	Energy & Climate Change: An Interdisciplinary Approach
or ENVS 3520	Energy and Climate Change: An Interdisciplinary Approach
GEOL 4080	
HIST 4267	
HIST 4326	Epidemic Disease in US History
HIST 4416	Environmental History of North America
PHIL 1160	Introduction to Bioethics
PHIL 1400	Philosophy and the Sciences
PHIL 3140	Environmental Ethics
PHIL 3160	Bioethics
PHIL 3200	Social and Political Philosophy
PHIL 5210	Philosophy and Social Policy
PHIL 5230	Bioethics and Public Policy
PHIL 5240	Seminar in Environmental Philosophy
PHYS 3000	Science and Public Policy
PHYS 3070	Energy and the Environment
or ENVS 3070	Energy and the Environment
PSCI 3064	Environmental Political Theory
PSCI 3201	
PSCI 4012	Global Development
PSCI 5016	
SOCY 1002	
SOCY 1022	Ethics and Social Issues in U.S. Health and Medicine
SOCY 2077	Environment and Society
SOCY 4007	Global Human Ecology
SOCY 6007	Foundations of Environmental Sociology

Global Engineering - Minor

Engineers of the 21st century will be working in a globalized industry. The Global Engineering Minor (<http://www.colorado.edu/engineering-international/global-engineering-minor>) will help them prepare for that challenge in three ways: (1) it will reveal the profession's global impact on economics, society, and the environment; (2) it will make students more sensitive to and aware of other cultures; (3) it will help students understand the overlapping and sometimes contradictory activities of local, national, international, and transnational agencies. Graduates with this Minor will be capable of negotiating complex, uncertain, and ambiguous circumstances, whether at home or abroad. Coursework for the Minor includes a specially designed cornerstone experience called "A Global State of Mind," and students must also study a foreign language of their choice. Additional coursework includes global perspective courses, a regional perspective course related to the student's chosen foreign language, and a globally-oriented technical elective. Most of these courses fit seamlessly into existing humanities and social science

(H&SS) and technical elective credit requirements so that students do not have to add significant additional coursework to their major. Finally, students pursuing the Minor must study, intern, or volunteer abroad through an approved program.

The Minor in Global Engineering replaces the certificates in Global Engineering and International Engineering as of fall 2016. Students who enrolled in the College of Engineering and Applied Science prior to fall semester 2016 have the option of completing either the Certificate or the Minor in Global Engineering, and/or the International Engineering Certificate. Students who enroll in the College starting with fall 2016 cannot pursue the certificate programs.

To enroll in the Global Engineering Minor (<http://www.colorado.edu/engineering-international/global-engineering-minor>), a student must be admitted to the College of Engineering & Applied Science and have a minimum 2.50 cumulative GPA. The minor requires at minimum completion of 6 courses for 18 credit hours, along with an approved global experience.

Completion Requirements

- HUEN 2843 "Special Topics: A Global State of Mind"
- Language Course (one course at fourth semester level or higher, depending on student's preparation)
- Global Perspective Courses (two courses, including at least one upper division)
- Regional/Local Perspective Course (one course, with focus on region to match language)
- Technical Elective (upper division course focused on a topic relevant to global engineering)
- Global Experience (A CU approved study, research, or internship abroad, or equivalent experience)

Lighting Design - Certificate

Our sense of sight is responsible for much of our perception of the world around us. Through the proper application of light, we can shape a viewer's understanding of architecture and influence the outcome of our architectural designs.

The undergraduate certificate in Lighting Design (<http://www.colorado.edu/lightingprogram/lighting-design-certificate>) is offered to students majoring in environmental design and theatre, as well as other non-engineering students, to expose them to the basics of architectural lighting and daylighting design. Topics include:

- Metrics of light
- Proper use of light sources, luminaires and controls
- Lighting effects on perception of architecture and how it fits into the architectural design process
- Daylight as a source and how it interacts with architecture
- Integration of daylight in interior spaces interacts with electric lighting

The certificate prepares students for entry-level jobs in lighting design firms. A combination of lighting design with architecture, landscape architecture, or design studies could also open doors in architecture and interior design firms.

Requirements

Admission

A cumulative GPA of 2.500 or higher is required to enroll. This certificate is not open to students rostered in the College of Engineering & Applied Science. First-year students are not eligible to take certificate courses - students may sign up for the certificate in the spring of their freshman year, and start taking classes in their sophomore year.

To enroll, students should complete the Lighting Certificate Declaration Form (<http://bit.ly/LightingCertificate>).

Grade Requirements

A cumulative GPA of 2.500 for all certificate courses is required, with no individual grade lower than C. A course not passed with the minimum grade may be repeated one time.

Course Requirements

The certificate is achieved through completion of four lighting courses: two required courses, one technical elective and a capstone or studio course.

Required Courses		6
AREN 4830	Special Topics for Seniors/Grads (Architectural Lighting Design - fall only)	
AREN 4830	Special Topics for Seniors/Grads (Architectural Daylighting Design - spring only)	
Technical Elective (current offerings, subject to change)		3
AREN 4530	Advanced Lighting Design	
AREN 4830	Special Topics for Seniors/Grads (Sustainable Lighting Workshop)	
THTR 3055	Stage Lighting Design 1	
Capstone or Design Studio (current offerings, subject to change)		3-6
AREN 4830	Special Topics for Seniors/Grads (Lighting Design Capstone - spring only)	
Total Credit Hours		12-15

Engineering Management

The Lockheed Martin Engineering Management Program (EMP) (<http://www.colorado.edu/emp>) is a technically-based management and leadership program for the engineering and technical fields that prepares students for early to mid-career positions in a variety of industries. It is designed for students who are looking to advance in management, successfully contribute to the overall business or venture, and develop their leadership skills.

The Program offers an Engineering Management minor, a certificate, and courses for undergraduate students in the College of Engineering and Applied Science. The minor and certificate are designed for Junior and Senior level engineering students who seek to develop business and industry acumen to complement their engineering majors. Courses are offered on campus with many virtual distance sections.

Course code for this program is EMEN.

Minor

- Engineering Management - Minor (p. 724)

Certificates

- Engineering Entrepreneurship - Certificate (p. 724)
- Engineering Management - Certificate (p. 724)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bailey, Wendy Lynn (https://experts.colorado.edu/display/fisid_154942)
Instructor

Bozic, Christy L (https://experts.colorado.edu/display/fisid_155482)
Scholar In Residence/Lecturer; PhD, Purdue University

Johnson, Eben Ormston (https://experts.colorado.edu/display/fisid_149952)
Instructor; MBA, University of California-Davis

Kirschling, Wayne (https://experts.colorado.edu/display/fisid_123149)
Scholar In Residence; DBA, University of Colorado Boulder

Littlejohn, Ray Lynn (https://experts.colorado.edu/display/fisid_151752)
Scholar In Residence; PhD, University of Oklahoma Norman Campus

Moorer, Daniel Fuller (https://experts.colorado.edu/display/fisid_151590)
Scholar In Residence; PhD, University of Colorado Boulder

Murray, Seth (https://experts.colorado.edu/display/fisid_148038)
Instructor; ME, University of Colorado Boulder

EMEN 3100 (3) Introduction to Engineering Management

Examines topics important to the management of engineering activities within organizations. Topics include the relationship of engineering to business and management disciplines, the functions of an engineering manager, principles and techniques for managing financial resource and business ownership. Explores best practices in global engineering management, process management, legal issues, ethics, organizational behavior and communications.

Grading Basis: Letter Grade

EMEN 4030 (3) Project Management Systems

Gain skills in project management, one of the fastest growing professions, using standard processes that fit into any industry, sector or geography. This interactive class provides students with the tools necessary to effectively initiate, execute, control and close any type of project for increased success. Students learn the skills to oversee projects to ensure it meets its goals, time line and budget.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4050 (3) Leadership and Professional Skills

Accelerate your personal and professional growth with the essential skills required to become an effective leader/manager. Conduct personal development through exercises in communication and leadership effectiveness. Explore leadership styles, managing commitments, change management, negotiation, conflict resolution, organizational culture, emotional intelligence, team dynamics and business ethics.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4100 (3) Engineering Economics

Introduces engineering cost concepts, financial statements and the corporate economic environment. Includes concepts and methods of analysis of the time value of money, comparison of project alternatives before and after taxes, cash flow, replacement analysis, risk management and financial case statements.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4200 (3) Engineering and Entrepreneurship for the Developing World

Use your engineering and problem solving skills, combined with market/industry research, customer interviews, design for manufacturability, stakeholder management and financial modeling to promote entrepreneurship and sustainable change in the developing world. Explore alternative energy, medical devices, phones, internet, recycling, cook stoves, clean water, sanitation and infrastructure.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

EMEN 4400 (3) Process and Quality Systems

Introduces the concepts, tools and techniques used in the management and measurement of quality and productivity in a business environment. Associated topics include: statistics methods, design quality, measurement, control and process improvement. Discover the basics of performance excellence management including Baldrige Award criteria, strategic planning, leadership and daily quality management.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4405 (3) Systems Engineering

Introduces students to system engineering in terms of defining objectives, applications and the major steps in the systems engineering process. Learn to work effectively with diverse project teams. Industry standards are covered that lay out the steps of the classic Systems Engineering lifecycle. Real world engineering examples from concept exploration to hardware retirement are used.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

EMEN 4800 (3) Technology Ventures and Marketing

Learn marketing concepts, skills and tools to launch new products and ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills and tools to be successful colleagues, managers and leaders in industry. Gain valuable business acumen using a hands-on learning environment.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4825 (3) Entrepreneurial Business Plan Preparation

Instructs students in the necessary elements of a business plan and how to prepare a complete well-written plan for an entrepreneurial business venture. Students work in interdisciplinary business-engineering five-person teams to create a business concept and take it through to business plan completion.

Equivalent - Duplicate Degree Credit Not Granted: ESBM 4830

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4830 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMEN 4840 (1-3) Independent Study Project

Available only through approval of Engineering Management Program. Subjects arranged to fit the needs of the particular student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Engineering Entrepreneurship - Certificate

The Undergraduate Engineering Entrepreneurship Certificate (<http://www.colorado.edu/emp/programs/undergraduate-programs/certificates/undergraduate-engineering-entrepreneurship-certificate>) prepares junior and senior engineering students with the knowledge, understanding, and skills to essential entrepreneurship in a start-up venture or within a larger corporation. This certificate develops entrepreneurial and leadership skills while introducing the students to the multiple facets of entrepreneurship, innovation, creative development, and the overall entrepreneurial process. Courses are available on-campus and some are available online (distance). Customize your program by choosing from three different electives. Many majors count these credits toward technical electives.

Requirements

The Undergraduate Engineering Entrepreneurship Certificate (<http://www.colorado.edu/emp/programs/undergraduate-programs/certificates/undergraduate-engineering-entrepreneurship-certificate>) requires 12 credit hours (6 core credits and 6 elective credits).

Engineering Management - Certificate

This Engineering Management Undergraduate Certificate (<http://www.colorado.edu/emp/programs/undergraduate-programs/certificates/undergraduate-engineering-management-certificate>) program prepares junior and senior engineering students for success in entry-level positions by providing business knowledge and skills in an engineering context. Courses are available on-campus and some are available online (distance). Customize your program by choosing from seven different electives. Many majors count these credit hours toward technical electives.

This certificate gives you the tools to understand the business framework in an engineering and technology environment increases your potential job opportunities and accelerates career development. Refine your interpersonal skills, develop your leadership skills and increase your confidence in working with others.

Requirements

The Undergraduate Engineering Management Certificate (<http://www.colorado.edu/emp/programs/undergraduate-programs/certificates/undergraduate-engineering-management-certificate>) requires 12 credit hours (3 core credits and 9 elective credits).

Engineering Management - Minor

The Engineering Management Minor (<http://www.colorado.edu/emp/engineering-management-minor>) complements the technical knowledge of a baccalaureate engineering program by introducing strategic, organizational, and communication business skills needed to succeed in today's job market. After completion of the requirements, the undergraduate minor in Engineering Management will be listed on the student's transcript at the time of graduation along with the student's BS degree.

Requirements

The Engineering Management Minor (<http://www.colorado.edu/emp/undergraduate-engineering-management-minor-course-requirements>) is open to undergraduate students rostered in the College of Engineering and Applied Science. Students must complete 18 credit hours: 3 required courses totaling 9 credit hours, plus an additional 9 credit hours of electives. Each course requires a minimum grade of D- or better (note, however, that a C- or better is required in all prerequisite courses to qualify to take a subsequent course). To meet the minor's residency requirement, at least three courses need to be taken at the University of Colorado Boulder (in person or online).

Engineering Physics

Engineering physics provides students with a broad exposure to the basic physical theories and mathematical techniques underlying engineering. The program may be specialized to meet the student's interests through engineering electives. Most students become involved in laboratory research, and graduates find opportunities in optics, electronics, magnetics, and other hardware-based job markets. The program also provides excellent preparation for graduate study in physics, applied physics, and other areas of the natural sciences and engineering.

The engineering physics program focuses on the foundations of modern technology. The program prepares students for research, development, and entrepreneurial careers in many frontier areas of engineering, including quantum devices, ultra fast lasers, adaptive optics, cryogenic electronics, computer simulation of physical systems, solar cells, magnetic storage technology, micro-mechanical systems, and molecular electronics. All students study the core theoretical subjects of mechanics, electricity and magnetism, thermal physics, and quantum mechanics, supplemented by courses in mathematics, computation, and laboratory technique. The program can be tailored to a student's interests through electives in engineering, physics, or other sciences.

Course code for this program is PHYS.

Bachelor's Degree

- Engineering Physics - Bachelor of Science (BS) (p. 728)

PHYS 1000 (3) Preparatory Physics

Introduces basic physics, emphasizing an analytical approach to prepare for PHYS 1110 and PHYS 1120, the engineering majors sequence. Does not satisfy any MAPS deficiency in either the sciences or math. Department enforced prerequisite: 1 year high school algebra.

Additional Information: Arts Sci Core Curr: MAPS Course

PHYS 1010 (3) Physics of Everyday Life 1

Intended primarily for nonscientists, this course covers physics encountered in everyday life. Topics include balls, scales, balloons, stoves, insulation, light bulbs, clocks, nuclear weapons, basics of flashlights, and microwave ovens. Department enforced prereq., high school algebra or equivalent. This course should not be taken if the student has a MAPS deficiency in math.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1020 (4) Physics of Everyday Life 2

Intended primarily for nonscientists, this course is a continuation of PHYS 1010. Includes electrical power generation and distribution, electrical motors, radio, television, computers, copiers, lasers, fluorescent lights, cameras, and medical imaging. Department enforced prereq., high school algebra.

Requisites: Requires prerequisite course of PHYS 1010 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

PHYS 1110 (4) General Physics 1

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. First semester of three-semester sequence for science and engineering students. Covers kinematics, dynamics, momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1110

Requisites: Requires prerequisite or a corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

PHYS 1115 (4) General Physics 1 for Majors

First semester of three semester sequence for physics, engineering physics and astronomy majors. Covers kinematics, dynamics momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1110

Requisites: Requires a prerequisite or co-requisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

Restricted to Physics (PHYS-BA) or Engineering Physics (EPEN-BS) or Astronomy (ASTR-BA) majors only.

Grading Basis: Letter Grade

PHYS 1120 (4) General Physics 2

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. Second semester of three-semester introductory sequence for science and engineering students. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1125

Requisites: Requires prerequisite courses of PHYS 1110 or PHYS 1115 and a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade of C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

PHYS 1125 (4) General Physics 2 for Majors

Three lect., one rec per week, plus three evening exams in the fall and spring semesters. Second semester of three semester introductory sequence for physics, engineering and astronomy majors. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1120

Requisites: Requires a prerequisite course of PHYS 1110 or PHYS 1115.

Requires a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to Physics (BA), Engineering Physics (BS) and Astrophysics (BA) students only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Sequence

PHYS 1140 (1) Experimental Physics 1

One lect., one 2-hour lab per week. Introduction to experimental physics through laboratory observations of a wide range of phenomena. Covers experiments on physical measurements, linear and rotational mechanics, harmonic motion, wave motion, sound and heat, electricity and magnetism, optics, and electromagnetic waves with the mathematical analysis of physical errors associated with the experimental process.

Requisites: Requires a prerequisite or corequisite course of PHYS 1120 or PHYS 1125 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

PHYS 1230 (3) Light and Color for Nonscientists

Discusses light, color, vision, and perception. Covers reflection, refraction, lenses, and applications to photography and other methods of light sensing. Other topics include lasers and holography. Course is geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1240 (3) Sound and Music

Explores the physical processes that underlie the diversity of sound and musical phenomena. Topics covered include the physical nature of sound, the perception of sound, the perception of pitch and harmony, musical instruments, synthesizers and samplers, and room acoustics. Geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1400 (1) Fundamentals of Scientific Inquiry

Explore and discuss the nature of science and what it means to work in science, technology, engineering or math. Focus on relevant open questions in these fields and the methods used to investigate them. For more information visit: www.colorado.edu/studentgroups/cuprime.

PHYS 1580 (3) Energy and Interactions

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physical content focuses on interactions and energy.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 1580

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

PHYS 2010 (5) General Physics 1

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers mechanics, heat and sound. Thorough presentation of fundamental facts and principles of physics using algebra and trigonometry. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020. Department enforced prerequisites: ability to use high school algebra and trigonometry.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science

PHYS 2020 (5) General Physics 2

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers electricity and magnetism, light and modern physics. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020.

Requisites: Requires a prerequisite course of PHYS 1110 or PHYS 2010 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

PHYS 2130 (3) General Physics 3

Covers special relativity, quantum theory, atomic physics, solid state and nuclear physics. Third semester of introductory sequence for science and engineering students. Physics majors should take PHYS 2170 instead of this course. Normally taken with PHYS 2150.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 2170

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

PHYS 2150 (1) Experimental Physics 2

One lect., one 2-hour lab per week. Includes many experiments of modern physics, including atomic physics, solid state physics, electron diffraction, radioactivity and quantum effects. Normally taken concurrently with PHYS 2130 or PHYS 2170, this course may be taken after PHYS 2130 or PHYS 2170.

Requisites: Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of PHYS 2130 or PHYS 2170 (all minimum grade C-).

PHYS 2170 (3) Foundations of Modern Physics

Covers special relativity, quantum mechanics and atomic structure. Completes the three-semester sequence of general physics for physics and engineering physics majors. Normally taken with the laboratory PHYS 2150.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 2130

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

PHYS 2210 (3) Classical Mechanics and Mathematical Methods 1

Theoretical Newtonian mechanics, including position and velocity dependent forces, oscillation, stability, non-inertial frames and gravitation from extended bodies. Ordinary differential equations, vector algebra, curvilinear coordinates, complex numbers, and Fourier series will be introduced in the context of the mechanics.

Requisites: Requires a prerequisite course of PHYS 2130 or PHYS 2170 and a prerequisite or corequisite course of APPM 2360 or MATH 3430 (all minimum grade C-).

PHYS 2840 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 3000 (3) Science and Public Policy

For nonscience majors. Reading, discussions, debates and lectures are used to study how science affects society economically, intellectually, and in terms of health and national security. Another focus is how government fosters and funds scientific activities. Department enforced prerequisite: completion of core science requirement.

PHYS 3050 (3) Writing in Physics: Problem-Solving and Rhetoric

Teaches strategies used in scientific writing with an emphasis on argument, reviews and reinforces essential writing skills, provides experience in writing both academic and professional communications in a style appropriate to the literature of physics. Department enforced prerequisite: lower-division core writing requirement.

Requisites: Requires a prerequisite course of PHYS 2130 or PHYS 2170 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Written Communication

PHYS 3070 (3) Energy and the Environment

Contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Included are some basic physical concepts and principles that often constrain choices. No background in physics is required.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3070

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

PHYS 3210 (3) Classical Mechanics and Mathematical Methods 2

Lagrangian and Hamiltonian treatment of theoretical mechanics, including coupled oscillations, waves in continuous media, central force motion, rigid body motion and fluid dynamics. The calculus of variations, linear algebra, tensor algebra, vector calculus, and partial differential equations will be introduced in the context of the mechanics.

Requisites: Requires a prerequisite course of PHYS 2210 (minimum grade C-).

PHYS 3220 (3) Quantum Mechanics 1

Introduces quantum mechanics with wave, operator and matrix computational techniques. Investigates solutions for harmonic oscillator, potential well and systems with angular momentum. Develops a quantitative description of one-electron atoms in lowest order.

Requisites: Requires a prerequisite course of PHYS 3210 (minimum grade C-).

PHYS 3221 (1) Tutorial Practicum for Quantum Mechanics 1

Uses interactive group work to aid student learning in co-requisite course PHYS 3220. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

Requisites: Requires a corequisite course of PHYS 3220.

Grading Basis: Pass/Fail

PHYS 3310 (3) Principles of Electricity and Magnetism 1

Covers mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, and polarized media, and provides an introduction to electromagnetic fields, waves, and special relativity.

Requisites: Requires prerequisite courses of PHYS 2210 (minimum grade C-).

PHYS 3311 (1) Tutorial Practicum for Electricity & Magnetism 1

Uses interactive group work to aid student learning in co-requisite course PHYS 3310. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

Requisites: Requires a corequisite course of PHYS 3310.

Grading Basis: Pass/Fail

PHYS 3320 (3) Principles of Electricity and Magnetism 2

Continuation of PHYS 3310. Electromagnetic induction; magnetic energy; microscopic theory of magnetic properties; AC circuits; Maxwell's Equations; planewaves; waveguides and transmission lines; radiation from electric and magnetic dipoles and from an accelerated charge.

Requisites: Requires a prerequisite course of PHYS 3310 (minimum grade C-).

PHYS 3330 (2) Electronics for the Physical Sciences

Introduces laboratory electronics for physical science students. Includes basic electronic instruments, dc bridge circuits, operational amplifiers, bipolar transistors, field-effect transistors, photodiodes, noise in electronic circuits, digital logic and microcontrollers. Students gain hands-on experience in designing, building and debugging circuits. Two lectures and one three hour laboratory per week. Concludes with a three-week project in which students design and build an experiment of their choice and present a seminar on the results.

Requisites: Requires prerequisite courses of PHYS 2150 and PHYS 2130 or PHYS 2170 (all minimum grade C-).

PHYS 4130 (3) Biological Electron Microscopy: Principles and Recent Advances

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stem, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5130

Requisites: Requires a prerequisite course of EBIO 1220 or MCDB 1150 or MCDB 4550 or MCDB 5550 or PHYS 1120 or PHYS 2020 (minimum grade D-).

PHYS 4150 (3) Plasma Physics

Discusses the fundamentals of plasma physics, including particle motion in electromagnetic fields, wave propagation, collisions, diffusion, and resistivity. Presents examples from space plasmas, astrophysical plasmas, laboratory fusion plasmas, and plasmas in accelerators.

Requisites: Requires a prerequisite course of PHYS 3310 and a prerequisite or corequisite course of PHYS 3320 (all minimum grade of C-).

PHYS 4230 (3) Thermodynamics and Statistical Mechanics

Statistical mechanics applied to macroscopic physical systems; statistical thermodynamics, classical thermodynamics systems; applications to simple systems. Examines relationship of statistical to thermodynamic points of view.

Requisites: Requires a prerequisite course of PHYS 2210 and a prerequisite or corequisite course of PHYS 3220 (all minimum grade of C-).

PHYS 4340 (3) Introduction to Solid State Physics

Discusses crystal structure, lattice dynamics, band theory, semiconductors and ferromagnetism.

Requisites: Requires a prerequisite course of PHYS 3220 (minimum grade of C-).

PHYS 4410 (3) Quantum Mechanics 2

Extends quantum mechanics to include perturbation theory and its applications to atomic fine structure, multi-particle systems, interactions with external forces, the periodic table and dynamical processes including electromagnetic transition rates.

Requisites: Requires prerequisite courses of PHYS 3220 and PHYS 3310 (all minimum grade of C-).

PHYS 4420 (3) Nuclear and Particle Physics

Introduces structure of the atomic nucleus, spectroscopy of subnuclear particles, scattering, reactions, radioactive decay, fundamental interactions of quarks and leptons.

Requisites: Requires a prerequisite course of PHYS 4410 (minimum grade of C-).

PHYS 4430 (3) Advanced Laboratory

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5430

Requisites: Requires a prerequisite course of PHYS 3330 (minimum grade of C-).

PHYS 4450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5450 and PHIL 4450 and PHIL 5450

Requisites: Requires a prerequisite course of PHYS 1020 or PHYS 1120 or PHYS 1125 or PHYS 2020 (minimum grade of C-).

PHYS 4460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching and education research.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5460 and EDUC 4460 and EDUC 5460

Requisites: Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade of C-).

PHYS 4510 (3) Optics

Basic electromagnetic theory of light, using Maxwell's equations. Examples in geometrical optics; extensive applications in physical optics including diffraction and polarization. Spectra, including Zeeman effect and fluorescence. Recent advances in experimental techniques: microwaves, lasers, image converters.

Requisites: Requires a prerequisite course of PHYS 3320 (minimum grade of C-).

PHYS 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extra-cellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5550 and MCDB 4550 and MCDB 5550

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 or MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

PHYS 4560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5560 and MCDB 4560 and MCDB 5560

Requisites: Requires a prerequisites course of PHYS 2210 (minimum grade C-).

Recommended: Prerequisite PHYS 4230.

Grading Basis: Letter Grade

PHYS 4610 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4620 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4620 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4630 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4620. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4810 (1-3) Special Topics in Physics

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4840 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4850.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4850 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4840.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4970 (3) Seminar on Physical Methods in Biology

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, Eels, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, Cat), Fourier analysis, synchrotron radiation, Exafs, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5970

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 2020 and MCDB 1150 or EBIO 1220 (all minimum grade D-).

Engineering Physics - Bachelor of Science (BS)

During the freshman and sophomore years, students receive a broad introduction to physics, chemistry, applied mathematics, and mathematical methods in physics. Starting in the sophomore year, students take electrodynamics, quantum mechanics, classical

mechanics, mathematical methods, thermodynamics and statistical mechanics, and advanced mathematics. In addition, there is a core of four laboratory courses that students take. Laboratory courses emphasize student-developed and student-designed independent projects in which students use the knowledge acquired to build apparatus of their own choosing. The capstone lab course, PHYS 4430, provides students with hands-on experience with optical spectroscopy, nuclear magnetic resonance, scanning tunneling microscopy, and laser cooling and trapping of atoms, among other experiments.

The program encourages the formation of student research collaborations with faculty in the pursuit of senior thesis projects. Recent projects include research in pulsed laser deposition of high-temperature superconductors, electron diffraction studies of protein structure, and lattice distortion theory of colossal magnetoresistance materials.

Students who plan to become registered professional engineers should check the requirements for registration in their state before choosing their engineering major.

For more information about the bachelor's degree in engineering physics, contact the Department of Physics (<http://www.colorado.edu/physics>), Duane Physics E1B32; 303-492-6953.

Concurrent Degree Program BS/MS in Engineering Physics and Physics

The BS/MS program in engineering physics aims to provide new opportunities for undergraduate Engineering Physics majors. The program is specifically addressed to engineering physics majors in the Department of Physics. The engineering physics major gives students a thorough grounding in theoretical physics, applied mathematics, and broad exposure to engineering topics, so that they are well prepared either to proceed with graduate work or with professional employment in either basic science or in applied fields. For students interested in graduate studies, the BS/MS program in engineering physics allows for participation in graduate course work and research in a broad range of areas. For students interested in immediate professional employment, the BS/MS program would serve as a terminal degree program that qualifies students for a higher level of employment.

For more information, see the Department of Physics Concurrent Bachelor's/Master's Degree (<http://www.colorado.edu/physics/academics/undergraduate-students/concurrent-bachelorsmasters-degree>) website.

Requirements

In order to earn a bachelor's degree in engineering physics, students must complete the curriculum in the undergraduate major programs available through the Department of Physics. (Some variations may be possible; see an engineering physics faculty advisor.) In addition, students must meet the general undergraduate degree requirements of the College of Engineering and Applied Science.

Sample Four-Year Plan of Study

Below is a suggested schedule only. For a complete description of the engineering physics course requirements, visit the Department of Physics (<http://www.colorado.edu/physics>) website.

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
CSCI 1300 or CSCI 1310	Computer Science 1: Starting Computing 1 or Computer Science 1: Starting Computi- - Experien	4
PHYS 1110	General Physics 1	4
Humanities or Social Science Elective ²		3
		Credit Hours 15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
Select one of the following: ¹		3
AREN 1027	Engineering Drawing	
MCEN 1025	Computer-Aided Design and Fabrication	
CSCI 2270	Computer Science 2: Data Structures	
PHYS 1120	General Physics 2	4
PHYS 1140	Experimenta Physics 1	1
Humanities or Social Science Elective ²		3
		Credit Hours 15
Year Two		
Fall Semester		
APPM 2350	Calculus 3 for Engineers	4
CHEM 1113	General Chemistry 1	4
CHEM 1114	Laboratory in General Chemistry 1	1
PHYS 2150	Experimenta Physics 2	1
PHYS 2170	Foundations of Modern Physics	3
Engineering Electives ³		4
		Credit Hours 17

Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
PHYS 2210	Classical Mechanics and Mathematical Methods 1	3
Engineering Electives ³		3
Free Electives		3
Humanities or Social Science Elective ²		3
		Credit Hours 16

Year Three**Fall Semester**

CHEM 1133	General Chemistry 2	4
CHEM 1134	Laboratory in General Chemistry 2	1
PHYS 3210	Classical Mechanics and Mathematical Methods 2	3
PHYS 3310	Principles of Electricity and Magnetism 1	3
PHYS 3330	Electronics for the Physical Sciences	2
Free Electives		3
		Credit Hours 16

Spring Semester

PHYS 3220	Quantum Mechanics 1	3
PHYS 3320	Principles of Electricity and Magnetism 2	3
PHYS 4230	Thermodynamics and Statistical Mechanics	3
Upper Division Math or Applied Math elective		3
Physics Electives ⁴		3
Humanities or Social Science Elective ²		3
		Credit Hours 18

Year Four**Fall Semester**

PHYS 4410	Quantum Mechanics 2	3
Engineering Electives ³		3
Physics Electives ⁴		3
Free Electives		3

College-Approved Writing Course ⁵	3
	Credit Hours 15
Spring Semester	
Engineering Electives ³	8
Physics Electives ⁴	3
Free Electives	3
Humanities or Social Science Elective ²	2
	Credit Hours 16
	Total Credit Hours 128

- Engineering physics computer science/drafting requirement (7–8 credit hours) is as follows: CSCI 1300 or CSCI 1310, along with CSCI 2270 or AREN 1027 or MCEN 1025.
- Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).
- Engineering electives: 17–18 engineering elective credit hours above and beyond the required courses for engineering physics. Total credit hours required in engineering electives plus the required computer science/drafting credit hours: 25.
- Nine credit hours of physics electives are required. For details, visit the Department of Physics (<http://www.colorado.edu/physics>) website.
- Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Engineering Plus

The Engineering Plus (<http://www.colorado.edu/eplplus>) program prepares graduates for exciting, diverse, and innovative professional careers and for graduate study in a wide variety of disciplines. The degree program provides a pathway through engineering for students interested in interdisciplinary, hands-on engineering design, coupled with a disciplinary engineering emphasis, plus the flexibility to explore another concentration of the students' choice within, or external to, engineering. Students complete core engineering and design coursework, followed by coursework in their chosen engineering emphasis (i.e., Aerospace, Architectural, Civil, Electrical, Environmental, or Mechanical.) Students also choose a concentration area, which can be student-designed or an established concentration such as secondary math or science teaching, entrepreneurship, pre-medical, and many others. Graduates from the Engineering Plus program will find opportunities in many engineering enterprises, as well as unique positions enabled by their engineering emphasis and concentration choices.

Program Objectives

The Engineering Plus program prepares its graduates to make significant contributions in many diverse areas. Specifically, within five years of graduation our graduates will have achieved one or more of the following attributes:

- established themselves as excellent secondary science or math teachers, utilizing hands-on engineering design content in their curriculum;
- established themselves in professional careers, received a graduate or professional degree, or be enrolled in a graduate or professional degree program;

- played significant roles in an engineering or technical enterprise, including research and development of engineering systems and products, technical sales, technical training, and organizational education;
- advanced in professional standing based on their technical accomplishments and accumulated additional technical expertise to remain globally competitive;
- demonstrated professional and personal leadership and growth.

Desired Outcomes

The undergraduate degree in Engineering Plus prepares students to meet the following outcomes upon graduation:

- ability to identify, formulate, and solve engineering problems;
- understanding of the impact of engineering solutions in global, environmental, and societal contexts;
- ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;
- ability to design a system, component, or process to meet needs within constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- knowledge in a specified concentration that is a meaningful contribution to your selected engineering emphasis;
- applicable knowledge of engineering, science, and mathematics;
- ability to function on multidisciplinary teams;
- understanding of professional and ethical responsibilities;
- effective communication skills;
- ability to design and conduct experiments, as well as to analyze and interpret data;
- recognition for the need and ability to engage in life-long learning;
- knowledge of contemporary issues in engineering and technology.

Course code for this program is **GEEN**.

Bachelor's Degree

- Engineering Plus - Bachelor of Science (BS) (p. 732)

GEEN 1010 (4) Engineering Explorations Through Physics

Explore the world of engineering through understanding physics concepts, engaging in active learning assignments, and conducting hands-on labs and experiments. Students will analyze product designs and engineering decisions based on the physics surrounding the situation. Formerly COEN 1010.

Requisites: Restricted to College of Engineering majors with 75 or less cumulative hours.

Grading Basis: Letter Grade

GEEN 1400 (3) Engineering Projects

First-year students solve real engineering design problems in interdisciplinary teams. Design projects vary by section. Curriculum focuses on iterative design process, teamwork and team dynamics, supporting design with testing and analysis, and technical writing. Completed projects are exhibited at an end-of-semester design expo. Students responsible for contributing towards their design project budget and poster costs, and purchasing safety glasses (approximately \$75).

Requisites: Restricted to College of Engineering majors with 75 or less cumulative hours.

GEEN 2024 (3) Materials for Engineers

Examines structure, properties, processing and uses of metallic, polymeric, ceramic and composite materials. Specific topics covered include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical and electrical behavior and failure modes. Approach incorporates both materials science and materials engineering applications.

Requisites: Requires a prerequisite course of PHYS 1110 (minimum grade C). Restricted to College of Engineering students only.

Grading Basis: Letter Grade

GEEN 2400 (3) Engineering Projects for the Community

Design engineering products for local community clients, with emphasis on humanitarian engineering and integrated systems with electrical, mechanical, and software components. Students are challenged to take design projects to a higher level by requiring an additional iteration through the design cycle and more engaged user-testing, in order to infuse student projects with the robustness necessary for public-use products.

Requisites: Requires prerequisite course of GEEN 1400 or COEN 1410 or ASEN 1400 or ECEN 1400 (minimum grade C). Restricted to College of Engineering majors only.

Grading Basis: Letter Grade

GEEN 2851 (3) Statics for Engineers

Examines vector treatment of force systems and their resultants; equilibrium of frames and machines, including internal forces and three-dimensional configurations; static friction; properties of surfaces, including first and second moments; hydrostatics; and minimum potential energy and stability.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 2121 and MCEN 2023

Requisites: Requires prerequisite course of PHYS 1110 (minimum grade C-). Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400. Restricted to College of Engineering majors only.

GEEN 3010 (3) Basic Electronics

Examines basic concepts of electricity, digital systems, circuit design and circuit analysis. Specific topics covered include analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis. Thevenin and Norton theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits, operational amplifiers and microcontrollers.

Requisites: Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of APPM 2360 (all minimum grade C). Restricted to College of Engineering undergraduate majors only.

Grading Basis: Letter Grade

GEEN 3400 (3) Invention and Innovation

Introduction to invention and product innovation with a hands-on approach. Students explore the invention process, hone their engineering design skills, and explore the initial stages of entrepreneurship (patenting, intellectual property, marketing research, and raising capital). Student teams design, create, and test a potentially commercial product, and exhibit at an end-of-semester design expo.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

GEEN 3830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to College of Engineering undergraduate students only.

GEEN 3852 (3) Thermodynamics for Engineers

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 3012

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 (minimum grade C-). Restricted to College of Engineering majors only.

GEEN 3853 (3) Fluid Mechanics for Engineers

Introduces fluid mechanics and momentum transfer, emphasizing the application of these principles to engineering systems.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 3200 and CVEN 3313 and MCEN 3021

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and CHEN 2120 or MCEN 2023 or CVEN 2121 (all minimum grade C-). Requires a prerequisite or corequisite course of APPM 2350. Restricted to College of Engineering majors only.

GEEN 4400 (3) Teaching Design

For pre-service math, science and engineering educators, this course focuses on teaching engineering design in secondary schools. Students examine the process of teaching hands-on design, including scoping, stages of team evolution, development of engineering identity and iteration. Students engage in practice of integrating design thinking into secondary math/science curriculum, develop ready-to-use tools and resources and explore the design education literature.

Requisites: Requires prerequisite courses of GEEN 1400 and EDUC 4060 (all minimum grade B). Requires corequisite course of GEEN 3400.

Restricted to Engineering Plus (GEEN) majors in CU Teach math, biology, chemistry or physics (TMMA, TSBI, TSCH, TSPH).

Grading Basis: Letter Grade

GEEN 4830 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering and Applied Science BS students or BS/MS Concurrent Degree Students only.

GEEN 4848 (1-6) Independent Study

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Engineering Plus (GEEN) students only.

Grading Basis: Letter Grade

Engineering Plus - Bachelor of Science (BS)

The Engineering Plus (<http://www.colorado.edu/eplplus>) program prepares graduates for exciting, diverse, and innovative professional careers and for graduate study in a wide variety of disciplines. The degree program provides a pathway through engineering for students interested in interdisciplinary, hands-on engineering design, coupled with a disciplinary engineering emphasis, plus the flexibility to explore another concentration of the students' choice within, or external to, engineering. Students complete core engineering and design coursework, followed by coursework in their chosen engineering emphasis (e.g., Aerospace, Architectural, Civil, Electrical, Environmental, or Mechanical). Students also choose a concentration area, which can be student-designed or an established concentration such as secondary math or science teaching, entrepreneurship, pre-medical, and many others. Graduates from the Engineering Plus program will find opportunities in many engineering enterprises, as well as unique positions enabled by their engineering emphasis and concentration choices.

Requirements

The BS degree in Engineering Plus (<http://www.colorado.edu/eplplus>) requires the satisfactory completion of the **Foundational Coursework**, the **Engineering Core**, a disciplinary **Emphasis**, plus a **Concentration**. This entails a minimum of 128 credit hours[§] as follows:

Foundational Coursework: 46-48 credits

- Foundational coursework (<http://www.colorado.edu/eplplus/current-students/foundational-coursework>) is common to all Engineering Plus majors. All foundational courses require a minimum grade of C in each course.

Engineering Core: 27-34 credits

- Engineering Core (<http://www.colorado.edu/eplplus/current-students/engineering-core>) coursework is common to all Engineering Plus majors. Core courses require a minimum grade of C in each course. Course titles within disciplines may vary; see disciplinary Emphases (<http://www.colorado.edu/eplplus/prospective-students/e-emphasis>) for discipline-specific core courses.

Disciplinary Emphasis: 22-28 credits

- Disciplinary Emphasis (<http://www.colorado.edu/eplplus/current-students/e-emphases>) coursework depends on the engineering emphasis (i.e., Aerospace⁺, Architectural, Civil, Electrical, Environmental, or Mechanical.) Emphasis courses require a minimum grade of C in each course for every disciplinary emphasis. To meet graduation requirements, the combination of engineering core and disciplinary coursework must sum to 52 credits or more. All Engineering Plus students, regardless of emphasis, are required to take the Fundamentals of Engineering (FE) exam when they are within 32 credit hours of graduation.

Concentration: 12-15 credits (except CU Teach Concentration: 29 credits, plus subject matter courses as required)

- The Engineering Plus Concentration (<http://www.colorado.edu/eplplus/current-students/e-concentrations>) allows students to select additional coursework in a chosen field of study, either within or outside of engineering. The concentration course sequence must be a series of courses with increasing specificity or depth within a field, typically culminating in senior level courses. Most concentrations will be at least four three-credit-hour courses. Every concentration **must** be preapproved by an Engineering Plus advisor **prior** to the commencement of the coursework. All concentration courses require a minimum grade of C in each course.

The Engineering Plus degree program is built around student choice and flexibility. The combinations of engineering emphases and available concentrations allow for more than 120 possible pathways. The sample curriculum below represents only a general idea of what is possible in Engineering Plus. Please visit the Engineering Plus website (<http://www.colorado.edu/eplplus>) or the Engineering Plus advisor for more specifics in planning your own unique pathway, and to ensure that all degree requirements are met.

BS Sample Curriculum

Course	Title	Credit Hours
First Year		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
GEEN 1400	Engineering Projects	3
Required Science Course*		3-5
Humanities or Social Sciences Elective**		3
	Credit Hours	13-15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
PHYS 1110	General Physics 1	4
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications (or another computing course)	4
Humanities or Social Sciences Elective**		3
	Credit Hours	15
Second Year		
Fall Semester		
APPM 2350	Calculus 3 for Engineers	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
GEEN 2400	Engineering Projects for the Community	3
Statics Course		3
Humanities or Social Sciences Elective**		3
	Credit Hours	18
Spring Semester		
APPM 2360	Introduction to Differential Equations with Linear Algebra	4
Disciplinary Emphasis Course		3
Disciplinary Emphasis Course		3
Materials Course		3
Humanities or Social Sciences Elective**		3
	Credit Hours	16
Third Year		
Fall Semester		
GEEN 3400	Invention and Innovation	3

Disciplinary Emphasis Course	3
Disciplinary Emphasis Course	3
Thermodynamics Course	3
Humanities or Social Sciences Elective**	3
Concentration Course	3
	Credit Hours
	18

Spring Semester

Disciplinary Emphasis Course	3
Basic Electronics Course	3
Measurement/Data Analysis Course	3
College-Approved Writing Course***	3
Concentration Course	3
Free Elective Course	3
	Credit Hours
	18

Fourth Year

Fall Semester

Disciplinary Emphasis Course	3
Disciplinary Emphasis Course or Free Elective Course	3
Disciplinary Emphasis Capstone/Sr. Design Course	3-5
Free Elective Course or additional Concentration Course	3
Concentration Course	3
	Credit Hours
	15-17

Spring Semester

Disciplinary Emphasis Course	3
Disciplinary Emphasis Course or Free Elective Course	3
Disciplinary Emphasis Capstone/Sr. Design Course	3-5
Concentration Course	3
Free Elective Course or additional Concentration Course	3
	Credit Hours
	15-17
	Total Credit Hours
	128-134

§ Students who select the CU Teach Engineering Math or Science Concentration will have a 9th semester student teaching experience. There is financial assistance available for these students.

+ Students seeking to enroll in ASEN courses must register through an Aerospace advisor.

* Science required course(s) depend on Emphasis chosen. Students should see disciplinary Emphases (<http://www.colorado.edu/eplus/prospective-students/e-emphasis>) for discipline-specific core courses.

** Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

*** Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Mechanical Engineering

Mechanical engineering prepares students for careers in a variety of industrial sectors including transportation, energy, manufacturing, aerospace, medical, and environmental. Career opportunities include work in basic and applied research and development, design, manufacturing, project management, consulting, and teaching. Mechanical engineers are employed by a wide variety of industrial, governmental, and educational organizations. A mechanical engineering

background also provides a firm foundation for other professional careers such as engineering management, law, and medicine.

A mechanical engineering education from the University of Colorado Boulder will prepare you for a future in a broad range of fields in science and technology. As a student, you'll receive a hands-on education that breaks out of the classroom to give you real experience in the industry. You'll learn from and work with a diverse faculty conducting groundbreaking research that is shaping the future of our world.

Course code for this program is MCEN.

Bachelor's Degree

- Mechanical Engineering - Bachelor of Science (BS) (p. 740)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa Abdalla (https://experts.colorado.edu/display/fisid_144736)
Associate Professor; PhD, University of Michigan Ann Arbor

Bergquist, Marcelo R (https://experts.colorado.edu/display/fisid_144022)
Senior Instructor/Instructor Adjunct

Borden, Mark A (https://experts.colorado.edu/display/fisid_148514)
Associate Professor; PhD, University of California-Davis

Branch, Melvyn C.
Professor Emeritus

Bright, Victor Mark (https://experts.colorado.edu/display/fisid_112696)
Professor; PhD, Georgia Institute of Technology

Brower, Timothy L (https://experts.colorado.edu/display/fisid_147553)
Senior Instructor; PhD, Colorado State University

Carlson, Lawrence E.
Professor Emeritus

Castro, Francisco (https://experts.colorado.edu/display/fisid_147992)
Instructor; PhD, University of Colorado Boulder

Daily, John W (https://experts.colorado.edu/display/fisid_100131)
Professor; PhD, Stanford University

Datta, Subhendu K.
Professor Emeritus

Ding, Yifu (https://experts.colorado.edu/display/fisid_146088)
Associate Professor; PhD, University of Akron

Dunn, Martin L (https://experts.colorado.edu/display/fisid_103706)
Professor; PhD, University of Washington

Ferguson, Virginia Lea (https://experts.colorado.edu/display/fisid_110131)
Associate Professor; PhD, University of Colorado Boulder

Geers, Thomas L.
Professor Emeritus

George, Steven (https://experts.colorado.edu/display/fisid_103289)
Professor; PhD, University of California-Berkeley

Greenberg, Alan R.
Professor Emeritus

Hamlington, Peter Edward (https://experts.colorado.edu/display/fisid_149800)
Assistant Professor; PhD, University of Michigan Ann Arbor

Hannigan, Michael P. (https://experts.colorado.edu/display/fisid_122655)
Associate Professor; PhD, California Institute of Technology

Henze, Daven Ker (https://experts.colorado.edu/display/fisid_144858)
Associate Professor; PhD, California Institute of Technology

Hertzberg, Jean R (https://experts.colorado.edu/display/fisid_105315)
Associate Professor; PhD, University of California-Berkeley

Humbert, James Sean (https://experts.colorado.edu/display/fisid_156202)
Associate Professor; PhD, California Institute of Technology

Kassoy, David R.
Professor Emeritus

Keplinger, Christoph Matthias (https://experts.colorado.edu/display/fisid_156421)
Assistant Professor; PhD, Johannes Kepler University Linz (Austria)

Knutsen, Jeffrey Steven (https://experts.colorado.edu/display/fisid_145534)
Instructor; PhD, University of Colorado Boulder

Kotys-Schwartz, Daria (https://experts.colorado.edu/display/fisid_144738)
Senior Instructor; PhD, University of Colorado Boulder

Kreith, Frank
Professor Emeritus

Lee, Se-Hee (https://experts.colorado.edu/display/fisid_144739)
Professor; PhD, Seoul Nat Univ (Korea)

Lee, Yung-Cheng (https://experts.colorado.edu/display/fisid_103170)
Professor; PhD, University of Minnesota Twin Cities

Li, Baowen (https://experts.colorado.edu/display/fisid_156203)
Professor; PhD, Carl von Ossietzky Universitat Oldenburg (Germany)

Long, Rong (https://experts.colorado.edu/display/fisid_151301)
Assistant Professor; PhD, Cornell University

Maute, Kurt Karl (https://experts.colorado.edu/display/fisid_113875)
Professor; PhD, Univ of Stuttgart (Germany)

McNeill, Nathan John (https://experts.colorado.edu/display/fisid_151518)
Instructor; PhD, Purdue University

Milford, Jana (https://experts.colorado.edu/display/fisid_103268)
Professor; PhD, Carnegie Mellon University

Miller, Shelly Lynn (https://experts.colorado.edu/display/fisid_110394)
Professor; PhD, University of California-Berkeley

Murray, Todd W (https://experts.colorado.edu/display/fisid_146549)
Associate Professor; PhD, Johns Hopkins University

Neu, Corey P (https://experts.colorado.edu/display/fisid_156210)
Associate Professor; PhD, University of California-Davis

Norris, Jan Adam (https://experts.colorado.edu/display/fisid_101412)
Lecturer; PhD, University of Colorado Boulder

Pellegrino, John (https://experts.colorado.edu/display/fisid_130902)
Research Professor; PhD, University of Colorado Boulder

Raj, Rishi (https://experts.colorado.edu/display/fisid_108413)
Professor; PhD, Harvard University

Reamon, Derek T (https://experts.colorado.edu/display/fisid_120538)
Senior Instructor; PhD, Stanford University

Rentschler, Mark Edwin (https://experts.colorado.edu/display/fisid_146091)
Associate Professor; PhD, University of Nebraska-Lincoln

Rieker, Gregory Brian (https://experts.colorado.edu/display/fisid_151727)
Assistant Professor; PhD, Stanford University

Ruben, Shalom D (https://experts.colorado.edu/display/fisid_149492)
Instructor; PhD, University of California-Los Angeles

Steinbrenner, Julie Elizabeth (https://experts.colorado.edu/display/fisid_152041)
Instructor; PhD, Stanford University

Stoldt, Conrad R (https://experts.colorado.edu/display/fisid_126290)
Professor; PhD, Iowa State University

Stowell, Michael (https://experts.colorado.edu/display/fisid_124136)
Associate Professor; PhD, California Institute of Technology

Tan, Wei (https://experts.colorado.edu/display/fisid_141464)
Associate Professor; PhD, University of Illinois at Chicago

Van Zeghbroeck, Bart J (https://experts.colorado.edu/display/fisid_104113)
Professor; PhD, University of Colorado Boulder

Vance, Marina Eller (https://experts.colorado.edu/display/fisid_158217)
Assistant Professor; PhD, Virginia Polytechnic Institute and State Univ

Vasilyev, Oleg V. (https://experts.colorado.edu/display/fisid_126641)
Professor; PhD, University of Notre Dame

Vernerey, Franck J. (https://experts.colorado.edu/display/fisid_144760)
Associate Professor; PhD, Northwestern University

Weidman, Patrick D.
Professor Emeritus

Xiao, Jianliang (https://experts.colorado.edu/display/fisid_149777)
Assistant Professor; PhD, Northwestern University

Yang, Ronggui (https://experts.colorado.edu/display/fisid_142640)
Professor; PhD, Massachusetts Institute of Technology

Yin, Xiaobo (https://experts.colorado.edu/display/fisid_153484)
Assistant Professor; PhD, Stanford University

Zable, Jack
Professor Emeritus

MCEN 1024 (4) Chemistry for Energy and Materials Science

Covers the basic physical and chemical fundamentals underlying the disciplines of energy and materials, with a focus on topics relevant to your mechanical engineering education. These fundamentals include atomic structure, stoichiometry, the periodic table, chemical bonding, states of matter, thermochemistry, and chemical reactions. Department enforced prerequisite: one year of high school chemistry.

Requisites: Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 1025 (4) Computer-Aided Design and Fabrication

Introduces CAD software and relevant concepts, including orthographic projection, sections, engineering drawing, geometric dimensioning and tolerancing, and an introduction to manufacturing methods. Final design project involves rapid prototyping.

Requisites: Restricted to Mechanical Engineering (MCEN) or Engineering Physics (EPEN) majors only.

Additional Information: Departmental Category: Design

MCEN 1208 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest. Credit to be arranged.

Requisites: Restricted to students with 0-26 units (Freshmen) Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Special Topics

MCEN 2000 (1) Mechanical Engineering as a Profession

Provides an introduction to the profession of mechanical engineering. Specific topics addressed include career opportunities in mechanical engineering, internship search skills, expectations for professional behavior in the classroom and in industry and current events/ethics topics relevant to the field. Course format may include additional evening/weekend activities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Mechanical Engineering (MCEN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 2023 (3) Statics and Structures

Covers statics of particles, equivalent force systems, rigid bodies, equilibrium of rigid bodies in two and three dimensions, analysis of truss and frame structures, uniaxially-loaded members, distributed force systems and friction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 2121 or GEEN 2851

Requisites: Requires prereq course of APPM 1360 or MATH 2300 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engineering Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Solids

MCEN 2024 (3) Materials Science

Provides an overview of the structure, properties and processing of metallic, polymeric and ceramic materials. Specific topics include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical behavior and material degradation. Approach incorporates both materials science and materials engineering components.

Requisites: Requires prereq course of MCEN 1024 or CHEN 1211 and CHEM 1221 or CHEM 1113 and 1114, and PHYS 1110 (min grade C).

Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Materials

MCEN 2043 (3) Dynamics

Covers dynamic behavior of particle systems and rigid bodies; 2-D and 3-D kinematics and kinetics; impulse, momentum, potential, and kinetic energy; and work, collision, and vibration.

Requisites: Requires prerequisite courses of MCEN 2023 or CVEN 2121 or GEEN 2851 (minimum grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Solids

MCEN 2063 (3) Mechanics of Solids

Covers shear force and bending moment, torsion, stresses in beams, deflection of beams, matrix analysis of frame structures, analysis of stress and strain in 2-D and 3-D (field equations, transformations), energy methods, stress concentrations and columns.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 3161

Requisites: Requires prereq courses of MCEN 2023 or CVEN 2121 or GEEN 2851 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Solids

MCEN 3012 (3) Thermodynamics

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles.

Equivalent - Duplicate Degree Credit Not Granted: GEEN 3852

Requisites: Requires prereq course of APPM 2350 or MATH 2400 (minimum grade C). Restricted to students with 27-180 credits (Soph, Jrs or Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Thermal

MCEN 3017 (3) Circuits and Electronics

Introductory course covers analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits and operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3010

Requisites: Requires prerequisite courses of APPM 2360 and PHYS 1140 (all minimum grade C). Restricted to students in the MSC/CU-Boulder Mechanical Engineering Partnership Program only.

Additional Information: Departmental Category: Miscellaneous

MCEN 3021 (3) Fluid Mechanics

Examines fundamentals of fluid flow with application to engineering problems. Topics covered include fluid statics and kinematics, Bernoulli equations, laminar and turbulent viscous boundary layers, laminar and turbulent pipe flow, and conservation equations for mass, momentum and energy.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 3200 and CVEN 3313 and GEEN 3853

Requisites: Requires prereq course of MCEN 2023 or CVEN 2121 or GEEN 2851 (min grade C). Requires prereq or coreq course APPM 2360. Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Fluids

MCEN 3022 (3) Heat Transfer

Studies fundamentals of heat transfer by conduction, convection, and radiation. Emphasizes problem formulation and selection of appropriate solution techniques. Provides applications to modern engineering systems, which may include energy, biological, environmental, and materials engineering problems.

Requisites: Requires prereq courses of MCEN 3021 and MCEN 3012 or GEEN 3852 and APPM 2360 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Thermal

MCEN 3025 (3) Component Design

Application of mechanics and materials science to the detailed design of various machine elements including shafts, bearings, gears, brakes, springs, and fasteners. Emphasizes application and open-ended design problems.

Requisites: Requires prerequisite courses of MCEN 1025 and MCEN 2063 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Design

MCEN 3030 (3) Computational Methods

Studies fundamental numerical techniques for the solution of commonly encountered engineering problems. Includes methods for linear and nonlinear algebraic equations, data analysis, numerical differentiation and integration, ordinary and partial differential equations.

Requisites: Requires prerequisite courses of APPM 2360 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Math

MCEN 3032 (3) Thermodynamics 2

Offers advanced topics and applications for thermal system design and analysis. Topics include thermodynamics of state, entropy, thermodynamic cycles and reacting and nonreacting mixtures. Provides application to power generation, refrigeration and HVAC with conventional and advanced technologies. Most assignments are design oriented.

Requisites: Requires prerequisite courses of MCEN 3021 and MCEN 3012 or GEEN 3852 and APPM 2360 (all minimum grade C). Restricted to students with 57-180 credits (Junior/Senior) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Thermal

MCEN 3047 (4) Data Analysis and Experimental Methods

Learn to plan and carry out experiments and analyze the results. Topics covered include measurement fundamentals, design of experiments, elementary statistics and uncertainty analysis. Topics in statistics include probability, error propagation, confidence intervals, hypothesis testing, linear regression, one- and two-factor ANOVA and time series analysis. Formerly MCEN 3037.

Requisites: Prereq APPM 2360 PHYS 1140 MCEN 2024 2063 a prereq or coreq ECEN 3010 or MCEN 3017 MCEN 3030 WRTG 3030 or 3035 or HUEN 1010 or 3100 (min grade C). Restricted to 57-180 credits MCEN or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Miscellaneous

MCEN 3208 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Requires prereq courses of APPM 2360 PHYS 1140 and prereq or coreq courses of ECEN 3010 and WRTG 3030 or WRTG 3035 or HUEN 1010 or 3100 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Special Topics

MCEN 3930 (6) Mechanical Engineering Cooperative Education

Students enrolled in this course participate in a previously arranged, department-sponsored education program with a university, government agency, or industry. This course is offered only through Continuing Education. 00 GPA or higher.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: At least a 2.75 cumulative GPA is required. Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Math

MCEN 4026 (3) Manufacturing Processes and Systems

Examines manufacturing processes for metals, polymers, and composites as well as manufacturing systems that integrate these processes. Lecture topics include forming, machining, joining, assembling, process integration, computer-aided manufacturing, and manufacturing system engineering.

Requisites: Requires prerequisite course of MCEN 2024 (minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering majors only.

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 4032 (3) Sustainable Energy

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5032

Requisites: Requires prerequisite course of MCEN 3012 and MCEN 3022 (minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Thermal

MCEN 4037 (2) Measurements Lab

Conduct experiments designed to introduce methods of experimentation and data analysis. Experiments taken from solid mechanics, fluid mechanics, thermal science and materials science. Emphasizes planning an experiment, applying sound scientific procedures, keeping proper records and communicating results orally and in written reports. Projects extend over two or more weeks.

Requisites: Requires prereq of MCEN 2063 3047 WRTG 3030 or 3035 or HUEN 1010 or 3100 (all min. grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Miscellaneous

MCEN 4043 (3) System Dynamics

Covers linear dynamic systems and mathematical tools for understanding them, input-output relationships, modeling templates, complex variables, Laplace transform, time-harmonic forcing and response, Fourier series and discrete Fourier transform, and coupled systems.

Requisites: Requires prereq courses of MCEN 2043 ECEN 3010 or MCEN 3017 APPM 2360 (min grade C) a prereq or coreq course of MCEN 3030. Restricted to students with 57-180 credits (Jrs or Srs) MCEN or GEEN-BS students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Solids

MCEN 4045 (3) Mechanical Engineering Design Project 1

First part of a two-course capstone design experience in mechanical engineering. Covers problem definition, determining design requirements, alternative design concepts, engineering analysis, proof-of-concept prototype and CAD drawings. Students make several oral design reviews, a final design presentation, and prepare a written report.

Requisites: Requires prereq of MCEN 2000,3022,3025 GEEN 1400 or 2400 or 3400 or COEN 1400 or ECEN 1400 (all min grade C). Prereq/coreq of MCEN 3047,4026,4043. Restricted to students with 87-180 units, MCEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Design

MCEN 4047 (2) Measurements 2

Emphasizes experiment planning, applying sound experimental procedures, using statistics, keeping proper records, and communicating results orally, visually, and through written reports. Projects extend over several weeks and relate to solid mechanics, acoustics, electronics, and/or other ME-related disciplines.

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 4037 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 4057 (3) Environmental Modeling

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5057

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and CSCI 1300 or CSCI 1320 (all minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 4085 (3-4) Mechanical Engineering Design Project 2

Second part of a two-course capstone design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product.

Requisites: Requires prereq courses of MCEN 4026, 4043 and 4045 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering (MCEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Design

MCEN 4086 (1) Writing for Design Projects

Communicate professionally in writing to the technical and nontechnical audience. Develop skills to analyze rhetorical situations and compose documents, such as reports, technical manuals and user guides, that achieve a specific purpose and meet the needs of a particular audience. Writing with clarity, conciseness and correctness will be emphasized.

Requisites: Requires enrollment in corequisite course of MCEN 4085.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 4115 (3-4) Mechatronics and Robotics I

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5115

Requisites: Requires prerequisite courses of ECEN 3010 or 2250 and ECEN 1310 (formerly GEEN 1300/COEN 1300) or CSCI 1300 or 1310 or 1320 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Design

MCEN 4117 (3) Anatomy and Physiology for Engineers

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5117

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 4123 (3) Vibration Analysis

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4123

Requisites: Requires prerequisite course of MCEN 3030 or ASEN 3112 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Solids

MCEN 4124 (3) Mechanical Behavior of Materials

Addresses the relationship between material structure and the fundamental processes of deformation, yield, and fracture. Examines elements of elasticity theory, introduction to plasticity, and formulation of failure criteria. Studies basic deformation processes in terms of dislocation mechanics and macroscopic mechanical behavior. Takes into consideration the influence of compositional and processing strengthening mechanisms on mechanical properties.

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Materials

MCEN 4125 (3) Optimal Design

Applies linear and nonlinear optimization methods to the design of mechanical components and systems. Examines unconstrained and constrained optimizations as well as formulation of objective functions, including cost, weight, response time and deflection. Applies knowledge to gears, springs, cams and linkages.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5125

Requisites: Requires prerequisite courses of MCEN 3025 and MCEN 3030 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Design

MCEN 4127 (3) Biomedical Ultrasound

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5127

Requisites: Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 4131 (3) Air Pollution Control Engineering

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5131

Requisites: Requires prerequisite courses of MCEN 3012 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Fluids

MCEN 4133 (3) Biomechanics

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5133

Requisites: Requires prerequisite courses of MCEN 2024, MCEN 2063 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Materials

MCEN 4135 (3) Wind Energy and Wind Turbine Design

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turbine and determining whether their proposal is feasible from an economic standpoint.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5135

Requisites: Requires prerequisite courses of MCEN 3021 and ECEN 3010 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Design

MCEN 4137 (3) Anatomy and Physiology 2

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5137

Requisites: Requires prerequisite course of MCEN 4117 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 4141 (3) Indoor Air Pollution

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5141

Requisites: Requires prerequisite courses of MCEN 3021 and MCEN 3022 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Fluids

MCEN 4151 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5151 and FILM 4200 and ARTF 5200

Requisites: Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Fluids

MCEN 4152 (3) Introduction to Combustion

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5152

Requisites: Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Recommended: Prerequisites MCEN 3021 and MCEN 3022.

Additional Information: Departmental Category: Thermal

MCEN 4154 (3) Biocolloids and Biomembranes

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5154

Requisites: Requires prerequisite courses of APPM 2360 and PHYS 1120 (all minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 4162 (3) Energy Conversion

Examines common energy-conversion methods and devices. Topics include power-cycle thermodynamics, turbocompressor and expander processes, combustion systems, and applications and limitations of direct energy-conversion systems.

Requisites: Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Thermal

MCEN 4173 (3) Finite Element Analysis

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5173

Requisites: Requires prerequisite courses of MCEN 2023 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Solids

MCEN 4174 (3) Failure of Engineering Materials

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5174

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Materials

MCEN 4183 (3) Mechanics of Composite Materials

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5183

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Solids

MCEN 4194 (3) Electrochemical Energy Conversion and Storage

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5194

Requisites: Requires prereq courses of MCEN 2024 and 3032 (all min grade C). Restricted to graduate students or to students with 87-180 credits (Seniors) in the College of Engineering and Applied Science or to Mech Engr Concurrent Degree students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 4228 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5228

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 4848 (1-6) Independent Study

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

Mechanical Engineering - Bachelor of Science (BS)

The educational objective of the undergraduate program in mechanical engineering is to prepare graduates so that they will build on the educational foundation gained through our program by establishing themselves in professional careers and/or pursuing a graduate degree within three years of graduation. In addition, within these three years, students should have begun to generate new knowledge and/or exercise leadership in their positions.

Each graduate of the mechanical engineering program is expected to:

- apply knowledge of mathematics, science, and engineering
- identify, formulate, and solve engineering problems
- use computers to solve engineering problems
- use modern instrumentation
- design and conduct experiments, including the use of probability and statistics
- analyze and interpret data
- design systems, components, or processes to meet desired needs
- understand the processes used to manufacture products
- understand contemporary issues in mechanical engineering
- demonstrate professional conduct in academic and workplace environment
- demonstrate effective oral and written communication skills
- function effectively on multi-disciplinary teams

- understand professional and ethical responsibility
- understand the impact of engineering in a global and societal context
- engage in lifelong learning

Colorado Mesa University/University of Colorado Boulder Mechanical Engineering Partnership Program

Colorado Mesa University (CMU) (<http://www.coloradomesa.edu/engineering>) and the University of Colorado Boulder have created a partnership to deliver a mechanical engineering baccalaureate program in its entirety in Grand Junction, Colorado. The first two years of the program are taught by CMU faculty and the second two years of the program are taught by CU Boulder faculty located in Grand Junction. Students completing the program will be awarded a BS in Mechanical Engineering from CU Boulder.

Concurrent Degree Program BS/MS in Mechanical Engineering

The concurrent bachelor's/master's degree program offers the opportunity of pursuing the bachelor's and master's degrees leading towards the awarding of the degrees at the completion of the joint program. The program is normally a five to six year program designed for currently enrolled CU Boulder students.

In order to gain admission to the BS/MS program in mechanical engineering, a student must meet the following criteria:

- Have a cumulative GPA of 3.250 or higher
- Have completed a minimum of 75 credit hours of coursework
- Transfer students must have completed a minimum of 24 credit hours at CU Boulder
- If admitted to the program, the student may not pursue a double degree with another baccalaureate program
- Students must have completed four of the following six courses: Component Design, Computational Methods, Fluids, Heat Transfer, Thermodynamics 1, Thermodynamics 2

The degrees will be awarded simultaneously when requirements for both degrees are met. If the student wishes to withdraw from the program and only receive the BS degree, they may do so by contacting the mechanical engineering graduate advisor. The Graduate School will then change their status from BS/MS Concurrent back to BS.

If you are interested in the BS/MS concurrent degree program, please contact the mechanical engineering graduate advisor for an application.

Requirements

Required courses in engineering, physical science, and mathematics are interwoven throughout the curriculum to provide a balanced education in the fundamentals of the mechanical engineering profession. The core courses are complemented by technical electives (<http://www.colorado.edu/mechanical/current-students/undergraduate/electives>), humanities and social sciences electives (<http://www.colorado.edu/engineering/academics/policies/hss>), free electives, and a writing course (<http://www.colorado.edu/engineering/academics/policies/hss>), for a total of 128 credits required for the degree.

Options in environmental and biomedical engineering are available for students interested in these interdisciplinary areas.

Prerequisites and Passing Grades

The minimum passing grade for a course that is a prerequisite or corequisite for another required course is C. If a grade of C- or lower is received in a course which is a prerequisite to another, the student may not register for the subsequent course until the first grade has been raised to a C or higher. If a grade of C- or lower is received in a course which is a corequisite to another, the course must be repeated until a grade of C or higher is achieved. The minimum passing grade for a course that is not specifically a prerequisite or corequisite for another required course is D-.

The Mechanical Engineering department reserves the right to drop students enrolled in MCEN courses who have not met the minimum prerequisite requirements. It is the student's responsibility to communicate with the department if summer coursework and/or transfer credit will be used to meet the prerequisite requirement.

Mechanical engineering students are expected to take Applied Math (APPM) courses for the required mathematics courses (APPM 1350, APPM 1360, APPM 2350, APPM 2360) once they have matriculated into the program.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
CSCI 1320	Computer Science 1: Starting Computing-Engineering Applications	4
PHYS 1110	General Physics 1	4
First-Year Engineering Projects Course		3
	Credit Hours	15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
MCEN 1024	Chemistry for Energy and Materials Science	4
MCEN 1025	Computer-Aided Design and Fabrication	4
PHYS 1120	General Physics 2	4
PHYS 1140	Experimental Physics 1	1
	Credit Hours	17

Year Two

Fall Semester

APPM 2350	Calculus 3 for Engineers	4
MCEN 2000	Mechanical Engineering as a Profession	1
MCEN 2023	Statics and Structures	3
MCEN 2024	Materials Science	3
PHYS 2130	General Physics 3	3
Humanities or Social Sciences Elective ¹		3
	Credit Hours	17

Spring Semester

APPM 2360	Introduction to Differential Equations with Linear Algebra	4
MCEN 2043	Dynamics	3
MCEN 2063	Mechanics of Solids	3
MCEN 3012	Thermodyna	3
MCEN 3021	Fluid Mechanics	3
	Credit Hours	16

Year Three

Fall Semester

ECEN 3010	Circuits and Electronics for Mechanical Engineers	3
MCEN 3022	Heat Transfer	3
MCEN 3025	Component Design	3
MCEN 3030	Computator Methods	3
College-Approved Writing Course ²		3
	Credit Hours	15

Spring Semester

MCEN 3047	Data Analysis and Experimental Methods	4
MCEN 4026	Manufacturi Processes and Systems	3
MCEN 4043	System Dynamics	3
General Technical Elective		3
Humanities or Social Sciences Elective ¹		3
	Credit Hours	16

Year Four		
Fall Semester		
MCEN 3032	Thermodynamics 2	3
MCEN 4045	Mechanical Engineering Design Project 1	3
MCEN Technical Elective		3
Humanities or Social Sciences Electives ¹		6
Free Elective		2
	Credit Hours	17
Spring Semester		
MCEN 4085	Mechanical Engineering Design Project 2	3
MCEN Technical Elective		3
General Technical Electives		3
Humanities or Social Sciences Elective ¹		3
Free Elective		3
	Credit Hours	15
	Total Credit Hours	128

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Technology, Arts and Media

Courses in Technology, Arts and Media (TAM) are offered through the ATLAS Institute (<http://atlas.colorado.edu>), a center of interdisciplinary research, learning and collaboration in engineering, creative technologies and design. ATLAS is a vibrant and growing community of researchers, instructors, and students from the arts, sciences, social sciences, and engineering whose interest in the creative application of diverse technologies creates a culture of innovation and interdisciplinary collaboration that benefits from strong ties to the technology sector in Colorado and beyond.

Created to equip students with new and adaptable skill sets for the ever-expanding digital landscape, the Technology, Arts and Media (TAM) program offers a bachelor of science, as well as minor and certificate programs. Through both the core curriculum and electives, TAM offers students a wide range of learning opportunities in subjects such as programming, physical computing, digital media, virtual reality, technology education, mobile application development, design, history of technology, big data, virtual reality, web design, user-interface/user-experience, robotics, and wearable technology.

Course code for this program is ATLS.

Centers and Labs

The ATLAS Institute is affiliated with the University of Colorado Boulder College of Engineering and Applied Science and the Graduate School. With a strong emphasis on design, research, project-based learning, and

creative production, the institute includes a wide range of research labs, creative studios, and learning facilities:

Laboratory for Playful Computation

A research lab that designs playful and programmable technologies to create new possibilities for fun, creative, and expressive STEM and computing-based learning.

Interactive Robotics and Novel Technologies (IRON) Lab

A research lab that explores human-centered principles for developing novel sensing, interactive, and robotic technologies, blending methods and techniques from computer science, design, engineering, and the social sciences.

Unstable Design Lab

A research lab that studies technology and culture through the design and development of technologies that embrace chance and uncertainty.

BTU Lab

A dynamic teaching facility, creative studio, and hackerspace that provides a range of physical computing, electronics, and fabrication technologies, including a laser cutter, 3D printers, and computers.

Novel Audio / Radiophonic Workshop and Laboratory (NARWAL)

A learning lab for sound exploration and tinkering with synthesizers, digital audio workstations, vintage audio platforms, and experimental interfaces.

Mixed Reality Lab

A learning lab that provides a range of emerging technologies for the exploration, project development and creative applications of virtual and augmented realities.

Heliographic Lab

Provides a range of technologies and materials for investigating digital imaging and photography through the production of creative works and projects.

Center for Media, Arts and Performance

Centered around the ATLAS Black Box theater, CMAP blends creativity, engineering, and the performing arts, serving as an incubator for the novel and experimental use of technology in music, dance, visual art, theater, film, and new media.

Bachelor's Degree

- Technology, Arts and Media - Bachelor of Science (p. 745)

Minor

- Technology, Arts and Media - Minor (p. 747)

Certificate

- Technology, Arts and Media - Certificate (p. 747)

Courses

ATLS 1100 (3) Design Foundations

Introduces foundational principles, practices and methods of design. Emphasizes design as an expressive and creative problem solving tool. This course engages with design from a broad perspective including visual, computational, physical and auditory design practices. Through lectures, discussions and creative projects, students will gain a familiarity with the diverse applications of creative technology through design.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors only.

Grading Basis: Letter Grade

ATLS 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an on-line virtual world called Second Life as the "Laboratory" for the course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the student to important ideas and concepts that shape the field of computer science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1220

ATLS 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather on the way in which computing has affected human culture and thought in the past half century.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1240

ATLS 1710 (3) Tools and Methods for Engineering Computing

Designed for students with little or no programming background. Students learn procedural and object-oriented programming through development of games, simulations, and animations using Flash/Actionscript, VB/Excel, Java, MATLAB, and real-world applications. Activities are oriented toward smaller projects that address topics in beginning science, engineering, and mathematics courses. Students gain practical, applicable skills.

ATLS 2000 (3) The Meaning of Information Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval. Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

Equivalent - Duplicate Degree Credit Not Granted: HUEN 2020

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

ATLS 2036 (3) Introduction to Media Studies in the Humanities

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant reading and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2036

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students in the Atlas student group (PATL) only.

ATLS 2100 (3) Image

Introduces techniques, technologies and concepts of digital image making and manipulation through lectures, projects and critiques. Focuses on digital photography, digital animation and digital video as a means to formal and expressive ends. This course also contextualizes practices and methodologies of digital imaging with historical and critical perspectives.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 2200 (3) Web

Introduces techniques, technologies and concepts of web design and development through lectures, projects and critiques. Focuses technically on HTML, CSS and JavaScript as the primary web technologies. Contextualizes the technical and societal implications of the Internet through historical and critical perspectives.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 2300 (3) Text

Introduces technologies, terminology and histories related to the design of text within digital and analogue media. Students will learn the fundamentals of design, typography and layout through lectures, projects and critiques. The curriculum surveys significant theoretical perspectives, historical periods and significant practitioners that influence the practice of typographic design.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 2519 (1-3) Special Topics in Technology, Arts and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 3000 (3) Code

Instructs non-computer science students in analyzing problems and synthesizing programs for the solution, emphasizing good engineering practices for program construction, documentation, testing, and debugging. Uses Java for programming projects. Formerly ATLS 2010.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade D-). Restricted to students in the ATLAS student group (PATL) only.

ATLS 3100 (3) Form

Teaches the fundamentals of 3D modeling, 3D animation and 3D printing / rapid prototyping from a conceptual and sculptural perspective. Through topical lectures, technical demonstrations and creative projects the course will introduce students to the potentials of thinking and working within 3-dimensional spaces.

Requisites: Requires a prerequisite courses of ATLS 2000 (minimum grade C) and CSCI 1300 (minimum grade C-). Restricted to Technology, Arts and Media (TMEN) majors or the PATL student group only.

Grading Basis: Letter Grade

ATLS 3110 (3) Motion

An animation-based projects course that advances student understanding of motion design in today's culture. Through active production and critical analysis, students will create new media projects and critically examine the history, social implications, and impacts of these forms of mass media.

Recommended: Prerequisite ATLS 2100.

ATLS 3112 (1-3) Digital and Social Systems Professional Development

Supports students in developing professional skills and practices in human computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3112

Repeatable: Repeatable for up to 10.00 total credit hours.

ATLS 3173 (3) Creative Climate Communication

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3173 and THTR 4173

Recommended: Prerequisite ENVS 1000.

ATLS 3200 (3) Sound

Introduces techniques, technologies and concepts of digital sound through lectures, projects and critiques. Focuses technically on digital sound creation, production, synthesis and interactivity. Explores various approaches to digital sound production through historical and conceptual perspectives.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Recommended: Prerequisite CSCI 1300.

Grading Basis: Letter Grade

ATLS 3500 (1-3) Client Projects in Technology, Arts and Media

Allows undergraduate students to work on collaborative projects with faculty and with external organizations under faculty supervision. Focuses on teamwork, conceptual planning, technical design and development and working within real-world client environments. Critical skills include project research, planning, design, development, troubleshooting and presentation.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ATLS 2000 and ATLS 3010 (all minimum grade C).

Recommended: Prerequisite ATLS 3020.

ATLS 3519 (1-3) Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

ATLS 3529 (1-3) Special Topics in Critical Perspectives in Technology

Analyzes critical perspectives in technology, art, and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4120 (3) Mobile Application Development

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5120

Requisites: Requires prerequisite course of ATLS 3000 or CSCI 1300 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4214 (3) Big Data Architecture

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5214

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade D-). Restricted to Technology, Arts and Media (TMEN) majors, Computer Science (CSEN/CSCI) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4230 (3) Case Studies in Information and Communication Technology for Development

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5230

ATLS 4519 (1-4) Advanced Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

ATLS 4529 (1-3) Advanced Special Topics: Critical Perspectives in Technology

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5529

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade D-). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4630 (3) Web Front-End Development

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5630

Requisites: Requires prerequisite courses of ATLS 2200 and ATLS 3000 or CSCI 1300 (all minimum grade C).

ATLS 4809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5809 and CSCI 4809 and CSCI 5809

Requisites: Restricted to students in the Atlas student group (PATL) only.

ATLS 4900 (1-3) Undergraduate Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Students work on research or a creative project guided by faculty. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of ATLS 3010 and 3020 (all minimum grade D-).

Technology, Arts and Media - Bachelor of Science (BS)

The Bachelor of Science in Technology, Arts and Media (BS-TAM) (<http://tam.colorado.edu>) is an engineering degree unlike any other. Encompassing a broad, transdisciplinary curriculum, BS-TAM blends creativity and design with a rigorous engineering curriculum that emphasizes critical thinking, problem-solving, and creative production. Attracting designers, makers, inventors, and builders seeking diverse and adaptable skills, the degree opens doors to a wide range of 21st-century challenges and opportunities.

Industry and Career Paths

- Information design and data visualization
- Web design and development
- Motion graphics, 3D modelling, and animation
- Video and narrative media
- Robotics and physical computing

- Internet of Things design
- Graphic design and visual communication
- Game design and development
- User interface design, user experience design and experience design
- Digital sound, audio production and electronic music
- Mobile application design and development

Students who complete BS-TAM are poised to pursue graduate or advanced degrees in engineering, other technological fields, and design.

Unique

BS-TAM is unique. With a solid engineering foundation, it caters to an emerging generation of hybrid students who resist the specialization required of traditional engineering disciplines, but eagerly seek mastery of diverse technical and computational skills in pursuit of creative goals and projects.

Hallmarks of the TAM Program

- Most TAM classes are small, studio-based courses that encourage group work and collaboration.
- TAM classes are around 58 percent female, a percentage well above most engineering and computing programs.
- TAM stresses knowledge, skills, and expertise in technology development, with a foundation in engineering and computational thinking; creative technologies and applications; and interdisciplinary perspectives on IT and society. The TAM faculty comprises technologists, designers, and artists from diverse fields who are passionate about sharing their unique knowledge with students.

Transdisciplinarity

BS-TAM is discipline-agnostic, encouraging students to pursue their interests and passions in ways that conform to, as well as transcend traditional disciplinary fields. By helping students discover, explore, and expand these interests, TAM faculty members prepare students for rapid shifts and innovations in tomorrow's technology landscape.

Creative Production and Critical Perspectives

TAM students are prolific creators who learn to critically and conceptually assess the works they create. Courses are designed on the studio model that integrates faculty and peer critique at every level. Graduates of the TAM program are savvy and resourceful engineers, equal parts creator and critic, artist and theorist.

Program Goals

- TAM stresses knowledge, skills and expertise in technology development, with a foundation in engineering, computational thinking, creative technologies, applications, and interdisciplinary perspectives on IT and society.
- Prepare engineers, technologists, designers, and artists for existing and emerging careers.
- Produce students with a mastery of creative technology who are adept at critical problem finding and solving.
- Equip students with technical, theoretical, and historical perspectives they need to contribute to developing new functionalities, aesthetics, and innovations of creative technology.

- Encourage investigation at the intersection of technology with other disciplines and practices.
- Enable students to think creatively, critically, and conceptually about technology and its impacts.
- The TAM faculty comprises engineers, designers, and artists from diverse fields who are experts in working with students of varied backgrounds, abilities and interests.

Degree Requirements Overview

Total BS credit hours: 128–133

General Course Work

Mathematics, Natural Sciences, Engineering and Computation	37-41
Humanities and Social Sciences (including 15 credit hours of upper division courses, with 12 credit hours in ATLS courses, and at least one college-approved writing course)	21
Free Electives	14-15
Foundation and Core courses (including a two-semester sequence of capstone projects-based courses)	32
Critical Perspectives in Technology Electives (including 6 credit hours of upper division courses)	6
Focus electives within one of the possible areas of specialization in Technology, Arts and Media	18
Total Credit Hours	128-133

Graduation Requirements for Completing the BS in Technology, Arts and Media

- Completion of the curriculum, consisting of a minimum of 128 and a maximum of 133 total credit hours
- A grade of C or better is necessary in all Foundation and Core Technology, Arts and Media courses
- The minimum passing grade for a course that is considered a prerequisite for another course is C-.
- Cumulative grade point average of 2.250 or higher, along with other CEAS graduation requirements detailed on the college's Graduation Requirements (<http://www.colorado.edu/engineering/academics/policies/graduation-requirements>) web page.
- The last 45 credit hours of the 128 required for the BS degree must be earned through CU Boulder coursework only, and while rostered in the College of Engineering and Applied Science.
- Pass/Fail credit will be permitted for 6 credits of free electives, or for courses above and beyond degree requirements.
- The College allows a maximum of 6 hours of Independent Study degree credit. A maximum of 3 hours may be taken in any one semester.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
First Year		
Fall Semester		
APPM 1350	Calculus 1 for Engineers	4
ATLS 2000	The Meaning of Information Technology	3
Natural Science Course		3-4

COEN 1500	Introduction to Engineering (or another college introductory course)	1
Humanities or Social Sciences Elective ¹		3
<hr/>		
		Credit Hours
		14-15
Spring Semester		
APPM 1360	Calculus 2 for Engineers	4
Natural Science Course		3-4
ATLS 1100	Design Foundations	3
First-Year Projects Course		3
CSCI 1300	Computer Science 1: Starting Computing (or another college introductory computing course)	4
		Credit Hours
		17-18

Second Year		
Fall Semester		
Mathematics Course		3
ATLS 2100	Image	3
ATLS 2200	Web	3
CSCI 2270	Computer Science 2: Data Structures	4
Natural Science Course		3-4
		Credit Hours
		16-17
Spring Semester		
Mathematics Course		3
ATLS 2300	Text	3
ATLS 3100	Form	3
Humanities or Social Sciences Elective ¹		3
Natural Science Course		3
Free Elective		3
		Credit Hours
		18

Third Year		
Fall Semester		
ATLS 3519	Special Topics in Technology, Arts, and Media (Object)	3
ATLS 3200	Sound	3
ATLS 3529	Special Topics in Critical Perspectives in Technology	3
Humanities or Social Sciences Elective ¹		3

College-approved writing course ²	3		
		Credit Hours	15
Spring Semester			
Critical Perspectives in Technology	3		
Humanities or Social Sciences Electives ¹	6		
ATLS Focus Courses	6		
Free Elective	3		
		Credit Hours	18
Fourth Year			
Fall Semester			
Capstone 1	4		
ATLS Focus Courses	6		
Free Electives	6		
		Credit Hours	16
Spring Semester			
Capstone 2	4		
ATLS Focus Courses	6		
Free Electives	4-6		
		Credit Hours	14-16
		Total Credit Hours	128-133

¹ Students may choose courses from the list of college-approved humanities and social sciences (HSS) electives (<http://www.colorado.edu/engineering/academics/policies/hss>).

² Students may choose a course from the list of college-approved writing courses (<http://www.colorado.edu/engineering/academics/policies/hss>).

Technology, Arts and Media - Certificate

The Certificate in Technology, Arts and Media provides a fundamental understanding of information technology and digital media production. The program will motivate students to think critically about technology and its impacts upon society.

Goals

- To equip students with a basic digital media skill-set
- To transform students from passive users of technology into active producers of technology
- To introduce students to critical thinking and theories relevant to digital media

Requirements

Students must have 2.500 cumulative GPA to be admitted to the Technology, Arts and Media certificate program.

This certificates requires completion of the four courses below for 12 credit hours.

Students must earn a minimum grade of C in all courses counted for the certificate. Course work used to satisfy requirements cannot be taken pass/fail. Failing to meet the minimum grade for any individual ATLS course twice will result in automatic removal from the certificate program.

Required Courses and Semester Credit Hours

ATLS 2000	The Meaning of Information Technology	3
ATLS 2100	Image	3
ATLS 2200	Web	3
ATLS 2300	Text	3
Total Credit Hours		12

Technology, Arts and Media - Minor

The Minor in Technology, Arts and Media (<http://tam.colorado.edu/minor.html>) (TAM) provides a broad multidisciplinary perspective that integrates technological skills with a critical, theoretical, and historical understanding of technology, media, and the arts.

Goals

- Prepare the next generation of artists, designers, and media producers.
- Give students the necessary technical, theoretical, and historical background to contribute to the development of new functionalities and aesthetics for computer media.
- Facilitate exploration at the intersection of technology and other fields and disciplines.
- Produce active and critically aware producers of creative technology.
- Enable students to think critically and conceptually about creative technology.

Requirements

Students must have 2.50 cumulative GPA to be admitted to the Technology, Arts and Media (TAM) Minor.

Students must complete a minimum of 21 credit hours, as detailed below. Coursework used to satisfy the minor requirements cannot be taken pass/fail. A minimum of 15 credit hours must be taken on the Boulder campus.

Students must earn a minimum grade of C in all courses counted for the minor or certificate. Failing to meet the minimum grade for any individual ATLS core course twice will result in automatic removal from the TAM program.

Required Courses and Semester Credit Hours

ATLS 2000	The Meaning of Information Technology	3
ATLS 2100	Image	3
ATLS 2200	Web	3
ATLS 2300	Text	3
ATLS 3000	Code	3
Upper Division Focus Elective ¹		3
Upper Division Critical Perspectives in Technology Elective ²		3
Total Credit Hours		21

¹ For a list of approved Focus Electives, visit the Focus Elective (<http://tam.colorado.edu/focuselectives.html>) webpage.

² For a list of approved Critical Perspectives in Technology Electives (CPT), visit the CPT Electives (<http://tam.colorado.edu/criticalperspectives.html>) webpage.

Courses may be taken concurrently, although some courses may have recommended and/or required prerequisites.

Environmental Design

Built on strong traditions within the design fields—including architecture, landscape architecture, and planning—the Program in Environmental Design (ENVD) offers an integrative approach to education and research. Committed to enriching the built, social and natural environments, this inclusive and creative community engages learning with local and global partners.

The program offers the Bachelor of Environmental Design (BEnvD)—a four-year, preprofessional degree that prepares students for the practice of and advanced study in design-based fields. From analyzing the design of individual buildings to the planning of entire regions, ENVD course work and projects that engage the diverse scales of environmental design. Course material ranges from building materials and prefabricated building systems to open space issues, political systems, and institutional arrangements.

By challenging the siloed thinking indicative of more traditional design programs, faculty and students in ENVD work together to:

- design solution-based approaches that blend technical, ecological, economic, social, cultural, aesthetic and ethical concerns;
- employ evidence-based knowledge to help inform design and planning decisions;
- spur an interdisciplinary dialogue integrating core design disciplines with the sciences, humanities, arts, and other professions; and
- address a spirit of service to diverse communities, social justice, and ecological sustainability.

Graduates from the Program in Environmental Design are uniquely qualified to confront the significant environmental challenges that lie ahead. By engaging in much more than vocational training, our students become adept at complex problem solving, analytical thinking, and leadership through course work in theory, history, ecological impact, materials and methods, and systems thinking. Students enroll in studios, lectures, and seminars taught by faculty with both academic and professional expertise. Students work directly with communities to integrate their social, ecological, and economic needs to support a sustainable future. Students employ state-of-the-art educational technology, including computing tools, fabrication equipment and advanced media.

The program's cross-disciplinary collaborations with colleagues in closely-affiliated CU programs enhances the curriculum and research within ENVD. Sharing in the diverse resources of Boulder campus—from natural sciences, social sciences, humanities, arts and technology fields—the ENVD program offers an educational opportunity like no other.

Preparing for a Professional Career

The program prepares preprofessional undergraduate students for professional graduate study in the design professions. As with other four year preprofessional degrees, such as the bachelor of science or bachelor of arts in architecture, the BEnvD prepares students for study in a master of architecture (MArch), master of landscape architecture (MLA), master of urban design (MUD) or master of urban and regional planning (MURP)

degree program, or Master of Fine Arts (MFA) in design or industrial design.

It is common for bachelor's of environmental design graduates to receive advanced standing for the work they have done in our program, which allows them to complete a graduate degree at other design schools in a shorter time.

Preparation for a Preprofessional Career in Architecture

The program prepares preprofessional undergraduate students for professional graduate study in architecture. The four year BEnvD degree is a preprofessional degree and is not accredited by the National Architectural Accrediting Board (NAAB) as a professional degree. NAAB does not accredit BA Arch, BS Arch or BEnvD degrees. The NAAB only accredits master of architecture (MArch), five-year bachelor of architecture (BArch), and doctorate of architecture (DArch) programs. The BEnvD degree prepares students for acceptance to NAAB-accredited programs. Students who have completed the BEnvD will normally be asked to complete a *minimum* of four semesters of additional course work (60 hours of credit) after admission into one of 95 NAAB-accredited graduate programs nationally.

In addition to earning a MArch degree, prospective architects must complete three years of internship and must pass a state professional licensing exam. This process is overseen by the National Council of Architectural Registration Boards (NCARB). Some intern requirements may be completed concurrently with studies. In the State of Colorado, individuals with seven years of experience in professional architecture may sit for licensing exams towards professional licensure.

Preparation for a Preprofessional Career in Planning

The program prepares preprofessional undergraduate students for professional graduate study in planning. The practice of planning is currently not licensed in most states. Professional membership and certification is overseen by the American Planning Association (APA) and the American Institute of Certified Planners (AICP). Degrees in the field are accredited by the Planning Accreditation Board (PAB) of the Association of Collegiate Schools of Planning.

Although students interested in entry-level positions in planning may find the BEnvD degree adequate, an advanced degree (MURP, PhD or other graduate planning focus) is highly desirable. Students primarily interested in professional practice should obtain a graduate degree in urban planning, in urban and regional planning, in urban planning and community development or in urban design. Students interested in teaching or research in planning should complete a PhD.

Preparation for a Preprofessional Career in Landscape Architecture

The program prepares preprofessional undergraduate students for professional graduate study in landscape architecture. To obtain a license, landscape architects should have an advanced degree and work experience, and pass the national examination. In the United States, licensing is overseen both at the state level and nationally by the Council of Landscape Architectural Registration Boards (CLARB). Accreditation of educational programs is voluntary. The Landscape Architectural Accreditation Board (LAAB) evaluates programs and provides an assessment. Advanced standing for graduate study is evaluated on a case-by-case basis, according to the standards of each graduate program as demonstrated by and in accordance with a student's prior academic accomplishments in the application, portfolio, and the transcript.

Preparation for Preprofessional Opportunities in Design

Professional and career opportunities are broad and varied. There is an increasing demand in the design, construction and development industries for people who combine an understanding of design with a specialized understanding of related fields like computing, management, finance or marketing. Some students may use the design studies major as general preparation for graduate study in any number of academic fields that are also concerned with the design and planning of the built environment such as art history, environment behavior studies, and information graphics. Other students may use this emphasis to prepare for further graduate study in a professional field related to architecture, landscape architecture and planning, including business, law, journalism, public administration, product design and digital design. Design thinking is increasingly recognized in the business world as a valuable expertise in the analysis of the design of corporate structures and business plans, industrial processes, manufacturing, marketing and other related pursuits. Excellent design constitutes a fundamental aspect of sustainability in any field.

Facilities

Facilities for the program are provided in the Environmental Design Building and at the Center for Innovation and Creativity (CINC) facility.

Environmental Design Building

Located in the heart of campus, the ENVD building (<http://www.colorado.edu/campusmap/map.html?bldg=ENVD>) houses administrative and faculty offices, studio spaces, conference rooms, lecture rooms and exhibit spaces located on the first floor, basement, and third floors of the building.

Studio spaces provide large open areas with individualized work tables available to students 24 hours a day. Studio's are located in the basement and on the third floor of the ENVD building. Students are expected to work within the studio space to complete their models or other design projects.

The Digital Media Center (<http://www.colorado.edu/envd/resources/dmc>), (DMC) an ENVD Academic Support Center, houses a photographic studio for portfolio, digital imaging computer workstations, a printing and production lab with state-of-the-art large format printers for professional style presentation boards and 3-D printers, and provides professional photography and videography services. The Center also serves as an audiovisual equipment check out center for ENVD faculty and students to check out digital cameras, laptop computers, digital projectors, laser pointers, hand tools and other teaching and presentation supplies. ENVD faculty, staff and students use these resources to produce images and materials for course assignments, research papers, research collaborations and other publications. The center also serves the program's needs for marketing and communications through the management of digital and printed communications including website, social media, brochures, posters and e-communications.

Creative Lab Center

The Creative Lab Center (<http://www.colorado.edu/envd/resources/cinc>) (CLC) provides students access to studio space along with specialized fabrication facilities in the University's Center for Innovation and Creativity which is located on the CU-Boulder East Campus. The digital design and fabrication resources at the CLC are supported by a state-of-the-art wood lab, metal lab, laser cutting machines, two 3-Axis CNC routers and a high end CPU lab. These labs enhance the ENVD curriculum by providing students with the technological resources for

design visualization, scale modeling and full scale prototyping, turning ideas into tangible objects.

A mandatory "Basic Safety Orientation" is required for all students before access to the facilities is granted. This course is an introduction to the program's safety policies as well as the proper use of personal safety equipment and safe practices on the fabrication equipment.

Lecture Series

The program's on-going lecture series, held Monday's at 5:47pm, enables students and faculty to meet alumni and other presenter's whose work significantly contributes to the different fields that make up the design professions and related fields. Other professional organizations and design-related institutions in the region also sponsor lectures and events that are open to the program's students. Lectures are video taped and available to the public. View the ENVD website for the lecture series (<http://www.colorado.edu/envd/news-events/547-lecture-series>) schedule and video archive. (catalog.colorado.edu/undergraduate/colleges-schools/environmental-design/%20www.colorado.edu/envd/news-events/547-lecture-series)

Policies & Requirements

Scholarships and Awards

A wide range of scholarships (<http://www.colorado.edu/envd/student-services/advising-center/scholarships>) and awards are available to environmental design students. They are sponsored by the program, the campus, the professions and other foundations and donors.

In addition to these scholarships, interested students may participate in faculty-student research projects funded by the Undergraduate Research Opportunities Program (UROP (<http://www.colorado.edu/suep/about-urop>)) programs, or in other research opportunities provided by the campus or in cooperation with the program's faculty.

Recognition of Academic Achievement

As a preprofessional program, the Program in Environmental Design provides an atmosphere for study and creative investigation. The program holds academic rigor and quality in the highest esteem. In recognition of high academic achievement and professional attainment, the program grants scholarly honors at graduation.

Students achieving a grade point average of 3.50 to 3.749 (honors) and 3.75 to 4.00 (special honors) are recognized at commencement. Honors are based on course work completed at the University of Colorado. A minimum of 70 credit hours of course work must be completed at CU to be eligible for honors.

Latin Honors—General Honors Program

All University of Colorado students may participate in the Latin honors granted by the College of Arts and Sciences. Students may graduate with Latin Honors (*summa cum laude*, *magna cum laude* or *cum laude*) through either the General Honors Program or their departmental honors program (*see below*). Granting of these honors is based on several criteria, including the quality of original scholarly work which is generally reported in the form of a thesis. Students interested in participating in the General Honors Program should visit the CU Honors Program website (<http://www.colorado.edu/honors>).

Latin Departmental Honors in Environmental Design

Environmental design students may graduate with Latin Departmental Honors (summa cum laude, magna cum laude or cum laude). Students with an overall GPA of 3.30 or higher propose a project to work on during their senior year of study under the guidance of a primary advisor. Students defend their thesis to a committee of three faculty (environmental design primary advisor, the honors council liaison and a faculty member from outside the department) in April. The full Honors Committee awards honors in the semester the student graduates. Deadlines can be found on the CU Honors Program graduation page (<http://www.colorado.edu/honors/graduation/convocation>).

Latin Honors candidates present work that is student initiated and student directed well beyond the requirements for required classwork. For the Program in Environmental Design Latin Honors (<http://www.colorado.edu/envd/student-services/advising-center/honors>) projects in fall into two major categories: research and design.

- **Research** projects present a heretofore-unanswered question then seek to answer it, relying on a variety of data or types of evidence. The product is a paper, the length of which is determined by the topic in conversation with the advisor.
- **Design** projects present a problem and propose a solution to that problem. The product is a design or object, presented with a critical introduction. Design theses go beyond designing a building, landscape, urban district, or planning problem that responds to conventional programmatic assumptions, to propose a new response to a problem identified by the student. The scope of the project and the design presentation are determined in conversation with the advisor.

Academic Standards

Student Rights and Responsibilities

The Program in Environmental Design is part of an academic community whose mission requires an open learning and working environment for students, faculty, staff and administrators. An open learning and working environment values and protects individual dignity and the integrity of human relationships and is based upon mutual trust, freedom of inquiry, freedom of expression and the absence of intimidation and exploitation. Any infringement upon these freedoms and rights may be cause for review by the program and/or by other university offices for retention in the program. Students in the program are subject to the policies and procedures governing student rights and responsibilities. See the campuswide Student Conduct & Colorado Creed (p. 25) section.

Ethics and Academic Dishonesty

Students in the Program in Environmental Design are subject to the Boulder campus Honor Code and are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Any act of academic dishonesty may result in sanctions from individual faculty and also be reported to the Honor Code Office for their review and action.

For a full description of Honor Code expectations and policies, see the campuswide Academic Integrity (p. 15) section.

GPA Requirements, Probation and Scholastic Suspension

Students who fail to meet the minimum cumulative grade point requirement of 2.00 are still permitted to continue their studies on a provisional basis.

First semester freshmen students who do not achieve a 2.0 will be placed on academic alert for the following semester and are required to submit an academic recovery plan with their advisor. Scholastic records of students are evaluated at the end of the second semester, if the student has not achieved an overall 2.0 the student will be placed on probation or suspended depending on an evaluation of meeting the academic recovery plan.

Continuing students who fail to meet the minimum cumulative grade point requirement of 2.00 in a given semester are permitted to continue their studies the following semester on a probationary basis. Scholastic records of students are evaluated at the end of the probationary semester, if the student has not achieved an overall 2.0 the student will be placed on suspension.

Students on suspension are not allowed to register on any campus within the University of Colorado system while on suspension, with the exception of continuing education courses or main campus summer sessions. A suspended student may take classes through Continuing Education or on any University of Colorado campus during the summer in order to raise their cumulative CU grade point to a 2.00 or higher to be eligible for re-admittance into the program. Suspended students may petition for early re-admittance, which are reviewed on a case-by-case basis by the program administration.

Students are notified of their academic status (e.g., alert, probation, suspension) in writing, with a copy of the letter placed in the student's file, directing the student to contact their advisor and prepare an academic recovery plan approved by their advisor.

Students in the Program in Environmental Design who withdraw from all their registered courses two semesters in a row will have a hold placed on their account prohibiting them from further registration with the exception of registration in Summer Session classes, which are not counted in the regular academic year. Students will not be readmitted for return to CU Boulder before one full academic year has elapsed (not including the semester of withdrawal).

Students suspended a second time are reinstated only under special circumstances. Students who believe that their situations warrant a departure from these normal stipulations may petition for reinstatement. The program looks with favor on such petitions only if the student has shown marked improvement in academic work or if there are remarkable circumstances that have contributed to the student's academic difficulties.

Attendance

Students are expected to subscribe to attendance and participation guidelines specified by instructors for individual courses in a manner that complies with university protocol. Given that a considerable portion of the ENVD curriculum is offered via studio courses, students are fully expected to comply with guidelines that may be different and more onerous than traditional lecture or seminar courses (e.g., attending skill sessions, lectures, juries and presentations).

The Program in Environmental Design currently offers specializations in architecture, landscape architecture, planning, and design studies. Policy questions may be directed to 303-492-7711 or ENVDoffice@colorado.edu.

Requirements for Admission

High School Students

Candidates for admission to the Program in Environmental Design are expected to meet the general requirements for admission to the university. See the Admissions (p. 97) section for specific requirements. Applicants to the program should possess a strong high-school or equivalent background, including four years of English and math, and at least three years of natural science (including physics and/or biology) and social science. Additional course work in math, social studies and the arts and humanities is recommended.

Transfer Students

Transfer students entering the program are admitted through CU Boulder's admission process directly into the Program in Environmental Design. A college-level GPA of 2.75 or higher is required. Preference is given to students who have taken college-level courses in the areas of architecture, planning or environmental studies. Completion of courses in related fields of social science, natural science, fine arts or humanities is also considered in admission review. All course work except the last term, if in progress, must be completed and must be listed on the official transcript sent for admission consideration.

Students are encouraged to transfer as early as possible in their undergraduate career due to the required sequence of design courses in the first two years of the curriculum. Students may declare their specialization in architecture, landscape architecture, planning or design studies when they transfer or after they complete the core program. While transfer students are admitted for the fall and spring terms each year, it is important to note that the core curriculum sequence begins in the fall semester with only limited opportunities to begin study out of sequence. Students who start the sequence in the spring semester will be required to complete summer classes in order to stay on track in the curriculum. All transfer students are required to take a minimum of 30 credit hours in the Program in Environmental Design.

A maximum of 60 credit hours taken at a two-year college may be applied toward the baccalaureate degree. In general, credit hours in vocational-technical courses are not accepted for transfer. Transfer agreements between the University of Colorado and all Colorado community colleges outline approximately one year of prescribed general education courses that may be completed as preparation for transfer into the Program in Environmental Design. As noted above, students should plan to transfer to the University of Colorado as soon as possible to start the sequential curriculum. See the Transfer of College-Level Credit (p. 111) section for admission standards for transfer.

Transfer Students from Other University Design Programs

Transfer students from other universities offering preprofessional or accredited professional degree programs in one of the program's specializations who enter CU Boulder may apply for equivalency and advanced standing. A portfolio review will be required for these students. In order for transfer credit to meet core degree requirements, a grade of B or better is required in the transferring class. For more information, visit the Academic Center for Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>) webpage.

Intrauniversity Transfer (IUT)

University of Colorado students in good standing who are interested in pursuing a degree in environmental design may apply for transfer into the program. Drop-in IUT advising hours are held for interested students

on Mondays, 1-3pm in ENVD 162. Students should contact the program office for meeting dates and application deadlines for specific semesters. We highly encourage prospective students to attend an Environmental Design Program tour, which are offered Monday–Friday at 12:30 p.m. in the lobby of the Environmental Design building on main campus.

For more information, please visit the program's Intrauniversity Transfer (<http://www.colorado.edu/envd/program-information/prospective-students/intra-university-transfer>) webpage.

Credit Policies

Advanced Placement

Advanced Placement (AP) and college-level credit may be granted on the basis of the College Board's Advanced Placement tests. For students who have completed AP course work in high school and received scores in the AP examination that meet university standards, then AP as well as college credit is granted. Granted college credit is treated as transfer credit without a grade but counts toward graduation requirements and could meet other specific degree requirements when applicable.

Incomplete Grades

The Program accepts incomplete agreements between faculty and students who have satisfactorily completed a substantial amount of coursework but are unable to complete the course requirements due to extenuating circumstances. In all cases, students must present evidence of circumstances beyond their control that prevent them from completing the class. The student and faculty member must complete an Incomplete Agreement outlining the terms of course completion and submit this agreement to their advisor in the Center for Academic Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>).

Independent Study

Ordinarily, only students at 3000 or 4000 studio level and who hold at least a 3.00 GPA are permitted to register for Independent Study (ENVD 3909) or Independent Study (ENVD 4909). Independent study credit is supervised by a faculty member and may not be used to substitute for any required core or design studio courses.

Additional requirements may be established depending on the proposed topic. No more than 3 credit hours of independent study credit during one semester and no more than a total of 6 are given for the entire time the student is enrolled in the program, unless an exception is granted by the Program.

A complete description of the scope of the independent work, a summary of how it will be carried out, and a definition of the intended outcomes must be submitted to the supervising faculty member no later than five days after the official beginning of a semester. Approval of the description must be by the faculty member and by program administration before permission is granted for enrollment in the independent study course. Students should make arrangements for the independent study course details during registration or well before the semester begins.

Other Credits

Credits for Teaching Assistant (ENVD 3919), Research Assistant (ENVD 4929), Professional Design Internship (ENVD 4939), Exploratory Internship (ENVD 3939) and for Independent Study (ENVD 3909) or Independent Study (ENVD 4909) are all guided by the same standards. Credits earned are subject to a 3 credit-hour limitation

per course, Independent Study is graded while teaching assistantships, research assistantships, and internships are offered on a *pass/fail* basis.

Pass/Fail Credits

A student may elect to take up to 6 credit hours toward the BEnvD degree on a pass/fail basis but these credit hours must fall in the category of general electives and may not include course work taught within the Program in Environmental Design. Courses within the Program in Environmental Design that are only offered as pass/fail are not subject to this policy.

ROTC Credit

Students matriculating in the Program in Environmental Design are eligible to participate in the ROTC programs on the Boulder campus.

Students interested in such programs should contact the professor in charge of the ROTC program of their choice (Army, Navy, Air Force) and also their ENVD academic advisor for information on residence and curriculum requirements for graduation. No more than 8 credit hours of ROTC courses may be applied to the BEnvD degree.

Transfer Credit

Credits transferred from other institutions are limited to the number of credit hours given for similar work in regular offerings at the University of Colorado and must meet the quality level expected at the University of Colorado Boulder. The program faculty, in conjunction with the Advising Center for Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>), may make exceptions to this policy.

The program does not accept vocational/technical course work in design, graphics or construction as meeting specific course requirements of the program; nor does it consider such course work as acceptable in fulfilling the program's elective requirements. Only in exceptional circumstances may a student petition the program to request a transfer of such credits.

A grade of C- or better is required in any course for which credit is granted in transfer from another institution to the university. However, in order for transfer credit to meet specific core degree requirements, a grade of B or better is required in the transferring class. Grades earned in other institutions (excluding other campuses of the University of Colorado system) are not factored in the CU grade point average.

For more information on transfer credit policies, see the Transfer of College-Level Credit (p. 111) section.

Residency Requirement

In order to graduate from the University of Colorado with a Bachelor of Environmental Design a student must complete a minimum of 30 credit hours within the Program in Environmental Design as well as complete their last semester in residence as a full-time student.

Advising

Academic advising for students presently enrolled or anticipating enrollment in the program is provided in a variety of forms. High school students or prospective transfer students from other universities are encouraged to participate in "Be a CU Student for a Day" or other visitation programs co-sponsored by the program and the CU Boulder Office of Admissions. For more information, see the Admission Visit Programs (<http://www.colorado.edu/visit/admissions>) or ENVD Transfers (<http://www.colorado.edu/envd/program-information/prospective-students/transfer-students>).

Students already enrolled in Boulder campus programs who are interested in intrauniversity transfer (IUT) into the Program in Environmental Design should refer to the ENVD IUT (<http://www.colorado.edu/envd/program-information/prospective-students/intra-university-transfer>) process.

Students enrolled in ENVD receive academic advising from professional staff in the Advising Center for Excellence (<http://www.colorado.edu/envd/student-services/advising-center-excellence>) through both appointments and open drop-in office hours.

New Student Welcome

Incoming freshmen and transfer students are invited to attend New Student Welcome programming during the summer prior to the start of the fall semester. Visit the New Student & Family Programs (<http://www.colorado.edu/orientation>) website to learn more.

All students are required to attend an ENVD information session during New Student Welcome Week in August to receive an overview of educational opportunities and the philosophy of the program, and to meet other new students and the faculty of the program. If you are starting your educational career in the spring semester, all students are required to attend an ENVD information session during New Student Welcome Week in January to receive an overview of educational opportunities and the philosophy of the program, and to meet other new students and the faculty of the program.

Retention of Student Work

As a condition of admission, the Program in Environmental Design may retain student work submitted in fulfillment of class requirements. This retained work may be used to provide outside agencies with tangible evidence of performance, to serve as additional visual aid material in presentations to other students, and to contribute to possible educational exhibits and publications requested by the university community and the general public. The program does not claim any copyright and intellectual ownership of the material, but does retain rights to display student work for marketing and promotion, or for academic purposes.

Students are responsible for recording their work for future use in their portfolios. When the program retains students' materials for displays or presentations, the program will ensure that students have the opportunity to reclaim and record their work for portfolio use.

Computing

The Program in Environmental Design requires that all incoming undergraduate students have and use their own computers and software applications in their studies. Suggested computer specifications and standards are posted on the Office of Information Technology (OIT)'s Recommended Software and Hardware List (<http://www.colorado.edu/oit/software-hardware/recommended-software-and-hardware-list>) webpage.

Neither the Boulder campus nor the Program in Environmental Design endorse nor require students to buy a computer from a particular manufacturer. The configurations suggested by OIT establish high performance requirements that can be found in many different computers. Specialized software requirements for different classes in the Program in Environmental Design appear on the syllabi for those classes, and that software is generally available at discounted student rates.

Programs of Study

The Program in Environmental Design at CU Boulder prepares students for graduate study and careers in architecture, landscape architecture, planning, urban design and other design professions. With a diverse faculty committed to excellence in teaching, research, scholarship and creative and professional work, the program provides students with a varied range of learning opportunities.

The Program in Environmental Design encourages students to expand their education opportunities and explore certificates available on campus. Students interested in the certificate options below or minors offered at CU should contact their academic advisor to have a plan set in place prior to their junior year.

To filter through all the minors and certificates offered at CU Boulder, see the undergraduate Programs A-Z (p.) section.

Bachelor's Degree

- Environmental Design - Bachelor of Environmental Design (BEnvd) (p. 758)

Minor

- Environmental Design - Minor (p. 762)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Arias, Ernesto G.
Professor Emeritus

Banasiak, Meredith A (https://experts.colorado.edu/display/fisid_144267)
Senior Instructor Adjunct; MArch, Arizona State University

Bellucci, Justin T (https://experts.colorado.edu/display/fisid_147703)
Instructor

Chawla, Louise
Professor Emeritus

De Lange, Marcel Sebastian (https://experts.colorado.edu/display/fisid_140404)
Senior Instructor; MS, Delft University of Technology (Netherlands)

Drennan, Kimberly Alaine (https://experts.colorado.edu/display/fisid_152242)
Instructor; MArch, Rhode Island School of Design

Goldstein, Bruce Evan (https://experts.colorado.edu/display/fisid_147755)
Associate Professor; PhD, University of California-Berkeley

Holbert, Marianne Bellino (https://experts.colorado.edu/display/fisid_146986)
Senior Instructor; MArch, Washington University

Juhasz, Joseph
Professor Emeritus

Kahn, David C (https://experts.colorado.edu/display/fisid_148105)
Senior Instructor Adjunct

Kemp, David John (https://experts.colorado.edu/display/fisid_158828)
Lecturer

Krizek, Kevin J. (https://experts.colorado.edu/display/fisid_145292)
Professor; PhD, University of Washington

Lanterman, John Chesley (https://experts.colorado.edu/display/fisid_140309)
Senior Instructor; MLA, University of Colorado Denver

Lindsay, Georgia (https://experts.colorado.edu/display/fisid_152004)
Senior Instructor; PhD, University of California-Berkeley

McCall, Raymond (https://experts.colorado.edu/display/fisid_102673)
Associate Professor; PhD, University of California-Berkeley

Muller, Brian H F (https://experts.colorado.edu/display/fisid_140230)
Associate Professor; PhD, University of California-Berkeley

Polizzi, Jade Venus (https://experts.colorado.edu/display/fisid_140368)
Senior Instructor; MArch, University of Colorado Denver

Rogers, Sarah (https://experts.colorado.edu/display/fisid_142221)

Roudbari, Shawhin (https://experts.colorado.edu/display/fisid_153645)
Assistant Professor; PhD, University of California-Berkeley

Sancar, Fahriye Hazer
Professor Emeritus

Schulte, Stacey Lynn (https://experts.colorado.edu/display/fisid_146819)
Instructor

Tavel, Michael D (https://experts.colorado.edu/display/fisid_148855)
Senior Instructor Adjunct

Van Vliet, Willem K. T.
Professor Emeritus; PhD, University of Toronto

Xu, Ping (https://experts.colorado.edu/display/fisid_101140)
Professor; PhD, Harvard University

Courses

ARCH 4010 (5) Architectural Appreciation and Design

Introduces basic processes and principles of architectural design. Provides a basis for understanding and evaluating architecture.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Architectural Engineering (AREN) majors only.

ENVD 1001 (1) ENVD First-Year Seminar

Transitions first-year ENVD students into college through the process of discovering their path to educational success. Provide opportunities to facilitate learning through peer support groups and curricular integration with the ENVD core classes.

Requisites: Restricted to Environmental Design (ENVD) major or minor students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Social Factors

ENVD 1004 (3) Introduction to Environmental Design Theory

Introduces students to the complexity of forces that interact to shape the designed environment. A lecture sequence and parallel set of design exercises exposes students to the theory and practice of environmental design, and to the important issues that guide the work of architects, landscape architects, urban designers, and urban planners. Open to nonmajors on a space available basis.

Recommended: Corequisites ENVD 1052 and ENVD 2001.

Additional Information: Departmental Category: History and Theory

ENVD 1010 (3) Design Appreciation

Designed for students who are interested in pursuing a degree in design. Provides a foundation for viewing the world through the "eyes" of a designer and gives a broad overview of various design professions including: Architecture, Planning, Landscape Architecture, and Industrial Design through a basic history of design and speculation concerning the future of these professions.

Requisites: Restricted to non-Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: History and Theory

ENVD 1012 (3) Digital Representation Methods for Environmental Design

Guides students through a process of exploration and expression using various digital design and representation techniques common to the disciplines of environmental design. This course seeks to demystify contemporary practices in digital design methods and propels students into this discourse with ongoing experimentation in digital design media. It will expose students to Adobe Creative Suite, AutoCAD and SketchUp.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Methods and Techniques

ENVD 1052 (3) Design and Communication 1

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by emerging digital techniques for the depiction of designed artifacts and environments, allowing students to extend and enhance their understandings of advanced practices for design visualization, representation and communication.

Recommended: Corequisites ENVD 1004 and ENVD 2001.

Additional Information: Departmental Category: Methods and Techniques

ENVD 1102 (3) Design and Communication 2

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by traditional techniques for the advanced practices for design visualization, representation, and communication.

Requisites: Requires prerequisite course of ENVD 1052 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisites ENVD 1104 and ENVD 2003.

Additional Information: Departmental Category: Methods and Techniques

ENVD 1104 (3) Introduction to Environmental Design Methods

Explores the forces and conditions that interact to shape the designed environment. It does so through a lecture sequence and parallel set of design exercises introducing students to the theory and practice of environmental design. It develops student understandings of the central role design thinking plays as the unique process used to effect appropriate change in the designed environment.

Recommended: Corequisites ENVD 1102 and ENVD 2003.

Additional Information: Departmental Category: History and Theory

ENVD 2001 (3) Human Behavior in Design and Planning

Examines reciprocal relationships between people and their built and natural environments, tracing major issues and approaches in design research to understand how people are influenced by the environment and how they can create healthy, just, and livable places.

Recommended: Corequisites ENVD 1004 and ENVD 1052.

Additional Information: Departmental Category: Social Factors

ENVD 2003 (3) Ecology and Design

Introduces basic principles and techniques of ecology as they relate to the design and understanding of the built environment. Includes a study of hazards and the impact of modern technology on the natural and built environments.

Recommended: Corequisites ENVD 1102 and ENVD 1104.

Additional Information: Departmental Category: Physical Factors

ENVD 2120 (6) Environmental Design Studio 1

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

Requisites: Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisite ENVD 3115.

Additional Information: Departmental Category: Studios

ENVD 2130 (6) Environmental Design Studio 2

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of architecture, urban design and landscape design - disciplines that share the responsibility for shaping the designed environment.

Requisites: Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisite ENVD 3003.

Additional Information: Departmental Category: Studios

ENVD 3003 (3) Site Planning

Introduces the site planning process including: site analysis and its relationship to building program and site concept, and preparation of site plans. Emphasis is placed on the planning of the physical site through a thorough understanding of process, land use, site constraints and synthesis of ecological, functional and aesthetic considerations in the site planning process.

Recommended: Corequisite ENVD 2130.

Additional Information: Departmental Category: Physical Factors

ENVD 3009 (1-6) Special Topics in Environmental Design

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topic class.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites ENVD 1004 and ENVD 1052.

Additional Information: Departmental Category: Miscellaneous

ENVD 3052 (3) Introduction to Computer Methods in Environmental Design

Surveys existing and emerging computer methods used in the environmental design professions, with an introduction to computer programming. Open to nonmajors with instructor consent.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3100 (6) Environmental Design Studio 3

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion. The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

Requisites: Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisite ENVD 3122.

Additional Information: Departmental Category: Studios

ENVD 3114 (3) History and Theory of Environmental Design at the Small Scale: Buildings

Focusing on buildings, this class surveys the built environment from the beginning of time through the present day. Emphasizing developments in the western world, it develops students' recognition of major styles, influential people, and drivers of building form.

Additional Information: Departmental Category: History and Theory

ENVD 3115 (3) Introduction to Building Materials and Systems

Surveys building methods, materials and assemblies from the designer's perspective.

Recommended: Corequisite ENVD 2120.

Additional Information: Departmental Category: Technology and Practice

ENVD 3122 (3) Research Issues and Methods in Design and Planning

Explores topics of current interest in planning. Looks at the development and social consequences of the neighborhood movement, forms of municipal and regional governments, regional settlement patterns, and new communities. Introduces selected methods from the social sciences used by planners and urban designers.

Recommended: Corequisite ENVD 3100.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3134 (3) History and Theory of Environmental Design and the Medium Scale: Precincts

Focuses on design projects not in a building envelope, including landscapes, public and private urban spaces, complexes and similarly scaled design projects. Aspects of architectural and planning thinking are interwoven in a landscape concentration.

Additional Information: Departmental Category: History and Theory

ENVD 3144 (3) History and Theory of ENVD: Systems

Provides an introduction to the history of urban planning and design practices and processes. Examines the history of city-building using examples drawn from the United States as well as other countries. Emphasis is on developing analytical methods and a critical approach in discussing and evaluating historical and contemporary planning issues, mechanisms and cases.

Additional Information: Departmental Category: History and Theory

ENVD 3152 (3) Introduction to Computer Graphics Applications

Explores principles and uses of computer graphics in design. Topics include creation and modification of complex two- and three-dimensional objects; orthographic and perspective views; use of color; input using mouse and digitizer; output using screen, plotter, matrix printer, and slides; automated aids for form generation and manipulation; and analysis of current and future trends of computer usage for design.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3200 (1-6) Advanced ENVD Studio

Design studio dealing with problems at an intermediate level of complexity: emphasis is on the interaction of form, use, and multiple values and technologies in conjunction with issues and techniques drawn from other content area courses of the curriculum.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Program in Environmental Design major or minor students only.

Recommended: Prerequisite ENVD 2130.

Additional Information: Departmental Category: Studios

ENVD 3212 (3) Color Theory

Illustrates color media techniques for the preparation, composition, and presentation of landscape and built environment drawings.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3252 (3) Computer Graphic Programming

Provides an introductory computer programming course designed to teach the capabilities of a computer in providing graphic representations of environments, including buildings. Open to nonmajors.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3300 (3-6) Special Topics: Intermediate Design Lab

Design lab exploring new and emerging themes in environmental design.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 3909 (1-6) Independent Study

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Additional Information: Departmental Category: Miscellaneous

ENVD 3919 (1-6) Teaching Assistant

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

ENVD 3929 (1) Peer Leadership and Mentorship and Transitioning Students

Designed to explore the student transition to university life and engage students in active leadership and mentoring capacity-building activities. Examines the role peers play in leading students through transitional development. Students will learn the theoretical basis for understanding student transition and develop their mentoring capacities as well as examine personal identity and values and its intersection with leadership and mentorship.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

Additional Information: Departmental Category: Miscellaneous

ENVD 3939 (3) Exploratory Internship

Offers professional experiences allowing students to discover a variety of design-related environments such as community engagement, non-profit work or assisting research. In addition to the internship experience, students attend four classroom sessions providing professional development exercises. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

Recommended: Prerequisite 2.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

ENVD 4009 (1-6) Special Topics in Environmental Design

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topics.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ENVD 2120.

Additional Information: Departmental Category: Miscellaneous

ENVD 4023 (3) Environmental Impact Assessment

Provides a field-oriented seminar in current environmental impact controversies. Gives attention to history, theory, and application of impact analysis at state levels for designers, land-use planners, and others involved in resource decision making. By instructor consent, open to nonmajors on a space available basis.

Additional Information: Departmental Category: Physical Factors

ENVD 4035 (3) Solar and Sustainable Design

Introduces aspects of solar technology relevant to the environmental design professions. Includes readings and lectures on the nature of energy limitations, energy needs, and the potential role of solar energy in meeting these needs.

Additional Information: Departmental Category: Technology and Practice

ENVD 4052 (3) Digital Presentation and Portfolio

Introductory course creating interactive web sites. Covers use of Hypertext Markup Language (HTML) and Flash to create linked pages containing text, images animations, menus, and buttons. Covers principles of site navigation, page layout, and graphic design for designers and planners.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4100 (3-6) Advanced Design Lab 1

Design lab exploring new and emerging themes in design.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3300 (minimum grade C-).

Additional Information: Departmental Category: Studios

ENVD 4112 (3) Architectural Graphics 1

Illustrates techniques of graphics communication and presentation for architectural design. Includes advanced delineation and use of color.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4122 (3) Digital Photo for Designers

Explores digital photographic workflow from capture to exhibition.

Students gain the ability to document their projects and utilize photography as a means of creative expression. Topics include: using DSLRs, Adobe Lightroom, retouching with Adobe Photoshop, time-lapse photography, Adobe Premier, professional printing, landscape and architectural photography, sharing work through blogs and social media, and submitting work for publication and exhibition.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4152 (3) Computer Graphic Applications

Introduces the mechanics of entering 2-D images and 3-D objects into the computer. Once entered, graphics are interactively rotated in space, walked through, and displayed in perspective from any position. Also covers the mechanics of other computer programs allowing additional manipulation of images and objects.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4212 (3) Architectural Graphics 2

Covers development of an architectural set of construction documents combined with job administration, field observation, and guest speakers from related construction and architectural disciplines.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4300 (3-6) Advanced Design Lab 2

Design lab exploring new and emerging themes in design.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 4100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 4311 (3) Housing Policies and Practices

A seminar providing students with a descriptive knowledge and analytical understanding of the use and development of residential settings in different political economies, globally divided into advanced capitalist nations, collectivist economies, and the third world.

Additional Information: Departmental Category: Social Factors

ENVD 4322 (1-6) Special Topics: Graphics

Provides an advanced seminar on special issues in design communications. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4340 (4-6) Landscape Design Studio

Studio in landscape design.

Requisites: Requires prerequisite course of ENVD 3300 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 4352 (1-6) Special Topics: Computer Methods

Topics include animation and environmental simulation, computational methods of technical evaluation and optimization, and computational mapping and analysis. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4361 (1-6) Special Topics: Social Factors in Design

Addresses variable topics in the relationship of human experience and behavior to the built environment, e.g., social research methods in environmental design.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Social Factors

ENVD 4363 (1-6) Special Topics: Physical Factors in Environmental Design

Includes such topics as appropriate technology, public policy and natural hazards, organization of the designing and building process, and physical elements of urban development.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Physical Factors

ENVD 4364 (1-6) Special Topics: History and Historiography of Environmental Design

Provides an advanced seminar on history and historiography of environmental design, e.g., American dwellings. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: History and Theory

ENVD 4365 (1-6) Special Topics: Technology and Practice

Provides an advanced seminar on new technologies and issues of professional practice in the environmental design professions.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technology and Practice

ENVD 4420 (3) Senior Capstone Seminar

Advanced seminar focuses on theoretical concerns and practical issues inherent in environmental design and planning. Views concerns and issues in terms of setting, processes, and planning and design outcomes. Provides a critical synthesis of the inherently interdisciplinary nature of planning and design education.

Requisites: Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 4440 (6) Landscape Design Studio 2

A preprofessional studio in landscape architecture.

Requisites: Requires prerequisite course of ENVD 4340 (minimum grade C-).

Additional Information: Departmental Category: Studios

ENVD 4764 (1-6) Special Topics: Theory and Criticism in Environmental Design

Provides an advanced seminar on theory and criticism in environmental design, e.g., architecture now and introduction to design theory and criticism. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: History and Theory

ENVD 4794 (3) History of Urban Design and Planning

Examines history of European and American planning and urban design in the late 19th and 20th centuries.

Requisites: Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: History and Theory

ENVD 4909 (1-6) Independent Study

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Additional Information: Departmental Category: Miscellaneous

ENVD 4919 (1-6) Teaching Assistant

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

ENVD 4929 (1-6) Research Assistant

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Additional Information: Departmental Category: Miscellaneous

ENVD 4939 (3) Professional Design Internship

Allows students to develop design and professional skills outside of the curriculum while working for an architecture, landscape architecture or planning firm. In addition to the internship experience, students attend four classroom sessions providing professional development exercises. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

Recommended: Prerequisite 3.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

ENVD 4972 (3) Honors Research Methods and Thesis Preparation

To prepare students for undertaking an independent research or design project in Environmental Design, this asks students to engage with existing literature in the field. Students will understand how research and design projects are conducted, and how their own work fits within a long tradition of scholarship. Department consent required.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Miscellaneous

ENVD 4979 (3) Honors Thesis

Working with an advisor, students prepare, complete, and defend an honors thesis project, either written or creative.

Requisites: Restricted to students with 57-86 credits (Junior).

Additional Information: Departmental Category: Miscellaneous

Environmental Design - Bachelor of Environmental Design (BEnvD)

Program Overview

Structure of the Undergraduate Curriculum

The Bachelor of Environmental Design curriculum is comprised of a shared core (lasting five semesters) followed by three semesters of course work focused on one of four specializations: architecture, landscape architecture, planning or design studies.

The shared core is innovative because it provides an intensive and balanced introduction to the traditional professions contained within the broad field of environmental design. The core provides students the information and flexibility to hone their career direction and specialization area. It allows opportunities for hands-on problem solving that features design studios as the primary teaching pedagogy. Anchored through a combination of lecture courses and studio instruction, the core curriculum builds upon studios where students solve design problems at three important scales of the built-environment: buildings, landscapes, and urban systems.

Prospective students often choose to enroll at CU in ENVD because they can advantageously leverage their first five semesters to help determine which specialization matches their strengths and aspirations. Others are attracted to ENVD because they can declare a specialization at the outset of their studies. Even more will choose ENVD because there is the opportunity to change their mind towards the end of the core and pursue a specialization to reflect their changing interests without a loss of credit or time towards graduation.

The specialization—upper division coursework in the final three semesters—allows students to pursue in-depth projects and gain more specialized skills necessary for pre-professional work or further study. The semester prior to the senior year (a.k.a., PRAXIS) offers options and opportunities for students to experiment and explore personal interests. Alternatively, students can pursue approved international study abroad options as part of the curriculum as well. The final year culminates into the specific requirements for the chosen specialization.

Educational Advantages of the BEnvD

The Program in Environmental Design provides a balanced introduction to environmental design. Despite the many design programs across the country, most focus on providing a generalized experience too broad to provide an in-depth exposure to the fundamentals of each discipline. ENVD's emphasis on both the breadth and depth of design allows students to gain the appreciation, information, skills, and experiences needed to make an informed decision about their career direction.

For the past 50 years, ENVD's innovative teaching style of studio instruction in small class sizes is reflected in the changes revolutionizing teaching across many universities and disciplines. From a student's first semester, they learn to work both in small groups and individually to solve design problems. Unlike most majors across the university, by the end of a student's first year, the small classes and unique teaching relationships will build relationships with several faculty and a cohort of their peers.

ENVD's curriculum stresses both critical thinking and applied project work. PRAXIS projects are not simply a capstone experience but are curricular experiences embedded into all levels of the curriculum.

Student satisfaction within higher education has been directly linked to teaching that incorporates projects where small student groups work together to solve problems that they know are important. By having real clients in the classroom and knowing that their work may influence design decisions, it shows students that learning and living are inextricably tied together.

The pedagogy of the program celebrates an interdisciplinary culture for both students and faculty. Mirroring emerging workplace trends in industry, students work within teams. Sometimes students work within multi-disciplinary teams where each profession shares its expertise and coordinates with others and sometimes within inter-disciplinary teams where the separate expertise is not as important as the ability to mutually and collaboratively define and solve a problem. Increasingly, in environmental design, at the end of each project the list of participants is as long as the endless list of credits we watch at the end of a motion picture.

Study Abroad

The Program in Environmental Design has, along with the Office of International Education, developed an exciting selection of study-abroad options. Study abroad gives students an array of unique experiences, and it can make students more competitive for graduate study and for employment. Summer programs and faculty-led programs are available to students after their first year of study. Full-semester programs are available to students starting in their third year. The study abroad program provides an academically challenging experience with extensive local support.

Environmental design programs in architecture, urban design or urban planning are offered in Sydney, London, Rome, Denmark and Barcelona. In addition, the Office of International Education offers more than 25 programs which offer courses appropriate to design. These courses offer students an opportunity to study the process of design in another culture and to examine their own perceptions and attitudes toward design. Programs outside of the preapproved listing may be considered for approval. Please meet with an ENVD academic advisor for details.

For more information about the study abroad programs, contact:

Office of International Education (<http://abroad.colorado.edu>)
University of Colorado Boulder
123 UCB
Boulder, CO 80309-0123
Phone: 303-492-6016

Dual Degree Program

BEnvD and a Degree in an Outside Major

In addition to the BEnvD degree, students may pursue a dual degree at CU Boulder. Past students have received the BEnvD degree concurrently with undergraduate degrees in business, engineering and various programs offered by the College of Arts and Sciences. Typically, specific course requirements do not change in either program of a double degree; and additional credit hours (varying by college) may be required.

All undergraduate students must complete the general education requirements and the requirements for their specific emphasis within the Program in Environmental Design in addition to the other requirements. Students considering a dual degree program are encouraged to speak with advisors in both units to determine requirements and procedures for application.

Requirements

General Requirements

Students must complete a minimum of 120 credit hours subject to the maximum outlined in this catalog, meet all specified university general education requirements, all major core requirements and maintain a GPA of 2.00 or better.

The curriculum for the Bachelor of Environmental Design (BEnvD) is subdivided into two parts:

1. The first part consists of a core lasting two-and-a-half years which provides a balanced introduction to each of the specializations offered. By the end of the core studies students select or confirm their intended specialization.
2. The second part is one-and-a-half years where students study their selected specialization. Studies lead to the degree Bachelor of Environmental Design (BEnvD) with a specialization in either Architecture, Landscape Architecture, Planning or Design Studies. The course of study for each specialization begins with a transition semester with options and opportunities for students to experiment and explore personal interests. Students select between foreign study and travel, certificate programs, design-build studios, and community services projects for real clients called PRAXIS studios. Each specialization has specific requirements for completing the major.

ENVD Core Studies

BEnvD students must complete one course from each of the following general education requirements areas with a grade of C- or better to fulfill university general education requirements.

Required Courses and Semester Credit Hours

Writing

One class from the following:	3
WRTG 1150 First-Year Writing and Rhetoric	
ENVS 1150 First-Year Writing in Energy, Environment and Sustainability	
ARSC 1150 Writing in Arts and Sciences	

Humanities

One class from one of these arts and sciences core areas:	3-4
Human diversity	
Literature and the arts	
Ideals and values	

Social Science

One class from one of these arts and sciences core areas:	3-4
Historical context	
United States context	
Contemporary societies	

Math

Select one class specific for the appropriate specialization:	4-5
<i>Architecture</i>	
MATH 1150 Precalculus Mathematics	
MATH 1300 Calculus 1	
<i>Planning</i>	
MATH 2510 Introduction to Statistics	
<i>Landscape Architecture and Design Studies</i>	
MATH 1150 Precalculus Mathematics	

MATH 1300	Calculus 1	
MATH 2510	Introduction to Statistics	
SOCY 2061	Introduction to Social Statistics	
Natural Science		
Select one class specific for the appropriate specialization:		4-5
<i>Architecture</i>		
PHYS 2010	General Physics 1	
<i>Planning, Landscape Architecture or Design Studies</i>		
CHEM 1011	Environmental Chemistry 1	
EBIO 1030 & EBIO 1050	Biology: A Human Approach 1 and Biology: A Human Approach Laboratory	
EBIO 1210 & EBIO 1230	General Biology 1 and General Biology Laboratory 1	
PHYS 2010	General Physics 1	
Total Credit Hours		17-21

Sample Four-Year Plan of Study

The first two-and-a-half years of BEnvD is a core program which is prerequisite for each of the specializations: architecture, landscape architecture, planning and design studies. There are corequisite ENVD core courses each semester, and the core courses are sequential from semester to semester.

Course	Title	Credit Hours
First Year		
Fall Semester		
ENVD 1004	Introduction to Environmental Design Theory	3
ENVD 1052	Design and Communication 1	3
ENVD 2001	Human Behavior in Design and Planning	3
Writing requirement		3
Humanities (see list of options above)		3
		Credit Hours 15
Spring Semester		
ENVD 1102	Design and Communication 2	3
ENVD 1104	Introduction to Environment Design Methods	3
ENVD 2003	Ecology and Design	3
Math requirement (see list of options above) ¹		3-5
Social science (see list of options above)		3
		Credit Hours 15-17
Second Year		
Fall Semester		
ENVD 2120	Environmental Design Studio 1	6

ENVD 3114	History and Theory of Environment Design at the Small Scale: Buildings	3
ENVD 3115	Introduction to Building Materials and Systems	3
Natural science requirement (see list of options above) ²		4-5
		Credit Hours 16-17
Spring Semester		
ENVD 2130	Environment Design Studio 2	6
ENVD 3003	Site Planning	3
ENVD 3134	History and Theory of Environment Design and the Medium Scale: Precincts	3
Non-ENVD elective		3
		Credit Hours 15
Third Year		
Fall Semester		
ENVD 3100	Environmental Design Studio 3	6
ENVD 3122	Research Issues and Methods in Design and Planning	3
ENVD 3144	History and Theory of ENVD: Systems	3
Non-ENVD elective		3
		Credit Hours 15
		Total Credit Hours 76-79

¹ Students intending to select in the architecture specialization are strongly encouraged to take a precalculus math class prior to their senior year.

² Students intending to select in the architecture specialization are strongly encouraged to take a physics class prior to their senior year.

Areas of Specialization

Architecture Specialization

Students develop design solutions for buildings and sites that are environmentally responsible, sustainable and ethical using conventional and experimental construction methods including design-build and digital fabrication that are aesthetically pleasing, functional and culturally relevant.

Course	Title	Credit Hours
Third Year		
Spring Semester		
ENVD 3300	Special Topics: Intermediate Design Lab	6
ENVD 3300	Special Topics: Intermediate Design Lab	3
ENVD elective		3
Non-ENVD elective		3
		Credit Hours 15
Fourth Year		
Fall Semester		
ENVD 4100	Advanced Design Lab 1	6
AREN 3050	Environmental Systems for Buildings 1 (or ENVD elective)	3
AREN 4035	Architectura Structures 1 (or ENVD elective)	3
Elective		3
		Credit Hours 15
Spring Semester		
ENVD 4300	Advanced Design Lab 2	6
AREN 3060	Environment Systems for Buildings 2 (or ENVD elective)	3
AREN 4045	Architectural Structures 2 (or ENVD elective)	3
Elective		3
		Credit Hours 15
		Total Credit Hours 45

Planning Specialization

Students focus on problems of sustainability in urban environments and the integration of urban design with other planning practices to address sustainability issues.

Course	Title	Credit Hours
Third Year		
Spring Semester		
ENVD 3300	Special Topics: Intermediate Design Lab (or Practicum or study abroad)	6
ENVD 3300	Special Topics: Intermediate Design Lab (approved certificate courses, study abroad or design studies)	3
ENVD or open electives		3
Non-ENVD elective		3
	Credit Hours	15
Fourth Year		
Fall Semester		
ENVD 4100	Advanced Design Lab 1 (Advanced Planning Seminar)	3
ENVD 3152	Introduction to Computer Graphics Applications (Geographical Information Systems-GIS)	3
ENVD 4023	Environment Impact Assessment	3
ENVD 4363	Special Topics: Physical Factors in Environmental Design (Transportation and Livable Communities)	3
Non-ENVD elective		3
	Credit Hours	15
Spring Semester		
ENVD 4420	Senior Capstone Seminar	3
ENVD 4311	Housing Policies and Practices	3
ENVD 4794	History of Urban Design and Planning	3

ENVD elective	3
Non-ENVD elective	3
Credit Hours	15
Total Credit Hours	45

Landscape Specialization

Students develop design solutions in all scales of sites from gardens, to neighborhoods, to district, to parks, to campuses, to watershed and regions that work in concert with natural systems and reflect both the art and science of design.

Course	Title	Credit Hours
Third Year		
Spring Semester		
ENVD 3300	Special Topics: Intermediate Design Lab (or Practicum or study abroad)	6
ENVD 3300	Special Topics: Intermediate Design Lab (approved certificate courses, study abroad or design studies)	3
ENVD or open elective		3
Non-ENVD elective		3
	Credit Hours	15
Fourth Year		
Fall Semester		
ENVD 4340	Landscape Design Studio	6
ENVD 4100	Advanced Design Lab 1 (Advanced Landscape Seminars)	6
ENVD or open elective		3
	Credit Hours	15
Spring Semester		
ENVD 4440	Landscape Design Studio 2	6
ENVD 4300	Advanced Design Lab 2 (Advanced Landscape Seminars)	6

ENVD or open elective	3
Credit Hours	15
Total Credit Hours	45

Design Studies Specialization

The design studies sequence provides students the opportunity to build interdisciplinary, flexible and specialized courses of study. Students must submit a program of study for approval by both a faculty advisor and an academic advisor prior to beginning the specialization.

Course	Title	Credit Hours
Third Year		
Spring Semester		
ENVD 3300	Special Topics: Intermediate Design Lab (or Practicum or study abroad)	6
ENVD 3300	Special Topics: Intermediate Design Lab (approved certificate courses, study abroad or design studies)	3
ENVD or open electives		3
Non-ENVD elective		3
Credit Hours		15
Fourth Year		
Fall Semester		
ENVD 4100	Advanced Design Lab 1 (Design Thinking)	3
ENVD electives		9
ENVD or open electives		3
Credit Hours		15
Spring Semester		
ENVD 4420	Senior Capstone Seminar	3
ENVD electives		9
ENVD or open elective		3
Credit Hours		15
Total Credit Hours		45

Environmental Design - Minor

The Program in Environmental Design offers a minor in environmental design for students who are not enrolled in ENVD. A minor in environmental design provides an approach to identifying and solving complex problems within the context of the built environment. It provides a foundation in theory, history and methodology employed in fields such

as architecture, planning, landscape architecture and related design disciplines.

The environmental design minor has three possible tracks: design, history and theory, and planning. These three tracks reflect the breadth of topics and methods covered in the environmental design curriculum and meet a variety of interests of students seeking the minor.

Requirements for a Minor in Environmental Design Design Track

The design track develops basic skills and knowledge about designing in the built environment. It provides design experience that enables students to better work with professional architects and planners or to go to graduate school in the professional design fields.

Required

ENVD 1052	Design and Communication 1	3
ENVD 1102	Design and Communication 2	3
ENVD 2120	Environmental Design Studio 1	6

History and Theory Courses

Select two from the following list:

ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings	
ENVD 3134	History and Theory of Environmental Design and the Medium Scale: Precincts	
ENVD 3144	History and Theory of ENVD: Systems	

Studio Class Option

Select one from the following list:

ENVD 2130	Environmental Design Studio 2 (Landscape Design)	
ENVD 3100	Environmental Design Studio 3 (Urban Design)	
ARCH 4010	Architectural Appreciation and Design (AREN only)	

Total Credit Hours 24

Environmental Design History and Theory Track

The theory track develops basic skills in design and an understanding of theories of design through history and in contemporary society. It provides a foundation for students interested in a broad range of fields, including computational design, urban and community development, resource management and technology.

Required

ENVD 1004	Introduction to Environmental Design Theory	3
ENVD 1052	Design and Communication 1	3
ENVD 1102	Design and Communication 2	3

History and Theory Classes

Select two from the following list:

ENVD 3114	History and Theory of Environmental Design at the Small Scale: Buildings	
ENVD 3134	History and Theory of Environmental Design and the Medium Scale: Precincts	
ENVD 3144	History and Theory of ENVD: Systems	

History theory elective: Select one from the following list: 3

ENVD 4364	Special Topics: History and Historiography of Environmental Design	
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or ENVD 4764 Special Topics: Theory and Criticism in Environmental Design

Total Credit Hours 18

Planning Track

The planning track develops basic skills and knowledge about urban and environmental planning. Students gain an understanding of land use, fundamentals of successful communities and the sustainable interaction of systems. This track enables students to work with professional planners and better understand planning as it applies to their own major field. It also prepares students for graduate study in planning.

Required

ENVD 3144	History and Theory of ENVD: Systems	3
ENVD 3300	Special Topics: Intermediate Design Lab (praxis or 4000-level planning studio)	6
Select three from the following list:		9
ENVD 3300	Special Topics: Intermediate Design Lab (required if taking praxis)	
ENVD 3152	Introduction to Computer Graphics Applications ((Geographical Information Systems-GIS))	
ENVD 4023	Environmental Impact Assessment	
ENVD 4311	Housing Policies and Practices	
ENVD 4361	Special Topics: Social Factors in Design	
ENVD 4363	Special Topics: Physical Factors in Environmental Design	
ENVD 4794	History of Urban Design and Planning	

Total Credit Hours 18

Media, Communication and Information

The College of Media, Communication and Information (CMCI) prepares students for careers as engaged and effective citizens endowed with deep understanding of the historical and contemporary context of human communication and expression. Mindful of the active role communication plays in shaping human relationships, CMCI trains graduates to study and practice constructive interaction among people, communities, industries and publics. The college equips students with the skills needed to produce, gather, archive, curate, analyze and evaluate the flood of information, messages, images, sounds and ideas that populate our complex and rapidly evolving global media landscape.

To these ends, CMCI resourcefully combines disciplines newly extended and empowered by digital media and the social and cultural transformations those media engender. These include established scholarly, creative and professional fields such as media studies, communication, the history and interpretation of film and television, journalism, advertising and video production in its cinematic, documentary and broadcast forms. But the college also houses both the fast-growing field of information science—a discipline that, through inquiry and innovation, tackles the problems and opportunities facing an increasingly networked society—and the emergent disciplines of intermedia art, design, music, writing and performance.

In giving these activities a collaborative home, CMCI facilitates innovative interactions among them. Its academic structure accordingly stimulates cross-disciplinary cooperation at all levels of curriculum, research and creative work. Further, CMCI promotes the transformational exchanges

it nurtures within its own walls for campus-wide benefit. Its organization thus fosters outreach to—and student and faculty participation from—other schools, colleges, centers and facilities throughout CU Boulder and the wider Colorado community.

CMCI's collaborative character is even more visible at the graduate level and in terms of its faculty's scholarly and creative work. Examples include the doctoral program in information science (p. 1296), the master's in interdisciplinary documentary media practices (p. 1291), the doctoral program in intermedia art, writing and performance (p. 1298) and the doctoral program in media research and practice (p. 1303), which offers three PhD tracks, each lodged in a different yet related department. CMCI's signature spirit of collaboration is further reflected in the various centers the college contains:

- the Center for Environmental Journalism (CEJ)
- the Center for Media, Religion and Culture (CMRC)
- the Center for the Study of Conflict, Collaboration and Creative Governance (3CG)

It is also reflected in the close relations the new college hopes to entertain with centers elsewhere on campus—for example, with the Center for Humanities and the Arts (CHA); the Center for Media, Arts and Performance (CMAP); and the Stan Brakhage Center.

Statement of Core Skills, Competencies and Scholarly and Creative Initiatives

CMCI attracts students, faculty and industry and creative professionals from across the closely related fields of media, communication and information. All of those either rostered in or affiliated with the new college accordingly share a set of skills, competencies and scholarly and creative interests that form a common core. This core is expressed at all levels of the college, from undergraduate curriculum and graduate training to the research and creative work of its faculty and both internal and external affiliates.

The Undergraduate Experience

All undergraduates enrolled in CMCI take as part of their experience a core curriculum designed to provide the broad intellectual framework common to each of the individual disciplines in which students eventually major. In addition to conveying the conceptual tools and perspectives all students in the college need, the core curriculum supplies the shared body of knowledge, exemplars and ideas required to build a coherent intellectual and creative community. Each academic unit within the college offers a unique curriculum determined by its faculty and expressed as a set of major requirements. Completion of the major requirements within a discipline provides students with depth of knowledge and expertise appropriate to earning a BA or BS as designated by their discipline.

Additionally, undergraduates enrolled in CMCI acquire the technical and computational skills needed to thrive in today's networked media environment. Training in these skills is provided through CMCI 1010, CMCI 1020 (required of all first-year students) and the core computing requirement, and is integrated into each student's chosen field of study. Finally, students in CMCI complete a secondary area of study outside of their major in order to build the intellectual versatility necessary for successful study and work in the field of media, communication and information.

Graduate Study

Curricula leading to advanced degrees are offered by all of the departments in the College of Media, Communication and Information. Students should consult the Graduate Catalog's Admissions (p. 864) section for admission and degree requirements. Curricula for graduate programs are listed under each department.

Policies & Requirements

Dean's List

Students in the College of Media, Communication and Information who have completed at least 12 credit hours of CU Boulder course work for a letter grade in any single semester with a term grade point average of 3.75 or better are included on the dean's list and receive a notation on their transcript and a letter from the dean.

Graduation with Honors

CMCI students may graduate with the honors designations of cum laude, magna cum laude or summa cum laude by completing the CMCI honors program, which involves completing a senior honors project within the major. Students interested in graduating with honors should contact the associate chair for their major department to learn more about this opportunity. Students in CMCI may also take honors courses through the College of Arts & Sciences Honors Program (<http://www.colorado.edu/honors>).

Graduation with Distinction

Students will graduate with CMCI Distinction if they have at least 60 credit hours completed at CU Boulder and have a grade point average of 3.75 or higher for all course work completed at the University of Colorado.

Program Awards and Scholarships

Alumni and friends of CMCI have made possible more than 30 annual scholarship and awards to officially admitted students in CMCI. The deadline for application is Feb. 15. For more information and applications instructions, visit the university's Scholarships (<http://www.colorado.edu/scholarships>) website. Incoming first-year students who have received a CU Boulder Esteemed Scholarship or Presidential Scholarship are automatically considered for a CMCI Merit Scholarship. For more information, visit CMCI's Financial Aid and Scholarships (<http://www.colorado.edu/cmci/life-at-cmci/financial-aid-and-scholarships>) webpage.

Academic Standards

Good Academic Standing

Good academic standing in the college requires a cumulative grade point average of 2.00 or above in University of Colorado work and a 2.00 grade point average for all CMCI major coursework. Grades earned at another institution are not used in calculating the grade point average at the University of Colorado. However, grades earned in another school or college within the University of Colorado system are used in determining a student's scholastic standing and progress toward the degree.

Probation

Students whose cumulative grade point average falls below 2.00 overall or 2.00 in CMCI major coursework are placed on probation. Those students who enroll in any term in the calendar year, excluding summers, after being placed on probation are expected to raise their grade point

to the minimum or above by the end of the term. Neither CU Boulder's summer session nor enrollment through Boulder evening courses counts as a probationary semester. Students are not dismissed at the end of the summer term.

Students placed on academic probation who elect to remain out of school for a full calendar year can return to the university with a two-semester window to achieve the required cumulative GPA or CMCI major GPA. Students on probation who return after a hiatus of one year are placed on a second probation at the end of the semester in which they return if their cumulative GPA or CMCI major GPA remain below the minimums and are dismissed from the university if they do not achieve the minimums by the end of the semester following the imposition of the second probation.

Scholastic Suspension

CMCI students are subject to suspension if they do not maintain a cumulative university GPA of 2.00 and a cumulative CMCI major GPA of 2.00.

Students whose GPA's fall below either of these levels are normally placed on probation for one semester, during which they have an opportunity to raise their averages to the required levels. Students who still have a cumulative average below 2.00 or a CMCI major GPA below 2.0 after their semester of probation will be suspended and will not be able to register for University of Colorado daytime courses on any campus during any academic year. Students suspended are eligible for readmission when they have achieved a cumulative 2.00 average or a 2.00 average in CMCI major courses by virtue of work done during the University of Colorado's summer term (any of the three campuses) and/or through the Division of Continuing Education and Professional Studies (Boulder evening or correspondence courses). Students who choose to enroll in continuing education courses to restore their good standing must maintain a 2.5 GPA or above in each term or be suspended from both day and continuing education classes. They also may return as transfer students when they have overcome their academic deficiencies by enrolling at another institution (i.e., by achieving an overall 2.00 average in the University of Colorado work plus all work taken elsewhere since suspension). These transfer grades are used only for the purpose of readmission and do not remain in the University of Colorado cumulative grade-point average. Suspended students pursuing this latter option have two semesters after readmission to bring their University of Colorado and/or CMCI major grade point average up to 2.00 or they are suspended again.

Academic Ethics

The College of Media, Communication and Information maintains the highest standards of intellectual honesty. Cheating; plagiarism; illegal possession and distribution of examinations or answers to specific question; alterations, forgery, or falsification of official records; presenting someone else's work as one's own or performing work or taking an examination for another student are examples of acts that may lead to suspension or expulsion. Reported acts of academic dishonesty are referred to the Honor Council. For more information, see the Academic Integrity (p. 15) section.

Policy on Grade Appeals

The following shall be the official policy of the College of Media, Communication and Information regarding grade appeals.

When a student believes that a grade has been improperly assigned, and discussions between the instructor and the student have not led to any resolution of the problem, then:

1. The student shall have the option of making a formal written appeal to the chair/associate chair of his/her department. The appeal must specify the remedy desired by the student, and it must be submitted within 45 days of the end of the academic term in which the course was taken.
2. The chair/associate chair will meet with the student and with the faculty member who taught the course. The instructor will be asked to submit a formal, written response to the student's written appeal. If the chair/associate chair is unable to broker a solution mutually acceptable to both student and instructor, then the chair shall appoint an ad hoc student ethics committee, which will review the dispute. The committee shall consist of two impartial faculty members competent in the subject matter of the course in question.
3. The department chair will convene the committee and provide the committee with the student's written appeal and the written response from the faculty member. Within 45 days, the committee will submit a report and recommendation to the chair, and the chair will recommend to the instructor either:
 - a. that the originally assigned grade stand; or
 - b. that a new grade be assigned.

In cases where a change of grade is recommended and the instructor does not wish to accept the recommendation of his/her colleagues, the materials will be submitted to the dean of CMCI who will review the materials and make a final decision.

Policy on Waiver of Degree Requirements

The College of Media, Communication and Information does not waive degree requirements or excuse students from completing degree requirements. Petitions for exceptions to the academic policies stated here may be submitted to the ad hoc Committee on Academic Rules and Policies. Such petitions will be considered only if they meet all three of the following conditions:

- The student must document that she/he has made every effort to fulfill the policy or requirement as defined and must demonstrate that no other options exist for fulfilling the requirement as defined in this catalog.
- The student must document that she/he is prevented from fulfilling the policy or meeting the requirement as defined here for compelling reasons beyond the student's control.
- The student must demonstrate to the satisfaction of the faculty committee that she/he has fulfilled or will fulfill the intent of the policy or the requirement through an appropriate alternative.

Students who believe that their circumstances meet the conditions to submit a petition must first consult with their academic advisor. If the advisor offers options for meeting the requirement or policy as defined here, the student must pursue those options and should not submit a petition.

Credit and Enrollment Requirements for Admission

Students will apply to the College of Media, Communication and Information in one of the six undergraduate majors. Students who are

not eligible for admission directly into the major may be admitted to the College of Arts and Sciences.

Transfer Students

Students applying to transfer into the College of Media, Communication and Information from another institution must have 24 credit hours of college credit and must have completed the equivalent of the introductory courses in the specific major with a GPA of at least 3.00, both overall and in the major courses. Students without 24 credit hours or the prerequisite courses should apply to the College of Arts and Sciences. For more information, see the undergraduate Transfer of College-Level Credit (p. 111) section. (catalog.colorado.edu/catalog/node/462)

Attendance Regulations

Students are expected to attend classes regularly and to comply with the attendance policies specified by their instructors at the beginning of each semester. A student who does not attend the equivalent of the first week's sessions of a class during a term may be administratively dropped from the class.

Credit Policies

Major Requirements

All coursework taken for major requirements must have a grade of C- or better in order to be counted toward the major requirements.

Pass/Fail

In addition to the university's general policies, majors in the CMCI may not take any MAPS, core requirements, certificate or minor courses, business, additional field of study or CMCI courses pass/fail, but any other course may be taken pass/fail. Up to six credit hours may be taken pass/fail, except for transfer students, for whom the limit is one credit hour in every eight attempted at the University of Colorado, up to the maximum of six credit hours.

Transfer Credits

Credit in subjects transferred from other institutions to the University of Colorado is limited to the amount of credit given for similar work at the University of Colorado. Transfer credits in CMCI courses are limited to 12 credits hours from four-year institutions and six credits hours from two-year institutions. All transfer credit is subject to approval of the assistant dean of CMCI. Work from another accredited institution of higher education that has been completed with a grade of C- (1.70) or better may be transferred to the University of Colorado. Categories of transfer course work not accepted by the university are described in the undergraduate Transfer of College-Level Credit (p. 111) section. All courses transferred from junior and community colleges carry lower-division credit. Courses transferred from four-year institutions generally carry credits at the level at which they were taught at the previous institution, but can be subject to review on a course-by-course basis.

Residence Requirement

CMCI students must complete a minimum of 45 credit hours in University of Colorado Boulder courses. Of these 45 credit hours, a minimum of 30 credit hours must be in upper-division credit hours completed as a matriculated student in the College of Media, Communication and Information at the University of Colorado Boulder and at least 15 of these upper-division credit hours must be in the major. A maximum of 6 credit hours taken at other University of Colorado campuses (CU Denver and UCCS) can be counted toward the minimum 45 credit hours required on the Boulder campus. Courses taken while on CU Boulder study abroad

programs, through CU Boulder Continuing Education or CU Boulder correspondence courses are considered to be in residence.

Senior Requirement

Seniors must file to graduate through the online system in the portal by November 1 of the semester prior to May and August graduation and March 1 of the semester prior to December graduation. All CMCI students should meet with their advisor the semester prior to graduation to complete the graduation check-out form.

Advising

Majors are encouraged to consult an advisor each registration period. Advising is available from faculty and staff throughout the academic year, and major advising sheets are provided for each sequence. However, students are ultimately responsible for fulfilling all degree requirements.

Dual Degree/Double Major Programs

Students may complete requirements in two fields and receive two degrees from the university. Such double-degree programs are available combining CMCI with business, engineering, music or disciplines in the College of Arts and Sciences. Students must make application for a double degree program in both CMCI and the Leeds School of Business, the College of Arts and Sciences, the School of Engineering and Applied Sciences or the College of Music. Any other combined program must be arranged by consulting both programs. All double degrees shall consist of a degree within CMCI and a degree outside CMCI.

Students may double major within CMCI. The primary major will determine whether the degree is a BA or BS. Students may not get a double degree within CMCI.

Colorado Student Bill of Rights

In the interests of promoting timely graduation and facilitating the transfer of students among the institutions of higher education in the state of Colorado, the College of Media, Communication and Information and the University of Colorado Boulder adhere to the Student Bill of Rights as presented in Colorado Statute 23-1-125.

- 23-1-125. Commission directive - student bill of rights - degree requirements - implementation of core courses - competency test - prior learning
 - a. Student bill of rights. The general assembly hereby finds that students enrolled in public institutions of higher education shall have the following rights:
 - i Students should be able to complete their Associate of Arts and Associate of Science degree programs in no more than 60 credit hours or their baccalaureate programs in no more than 120 credit hours unless there are additional degree requirements recognized by the commission;
 - ii A student can sign a two-year or four-year graduation agreement that formalizes a plan for that student to obtain a degree in two or four years, unless there are additional degree requirements recognized by the commission;
 - iii Students have a right to clear and concise information concerning which courses must be completed successfully to complete their degrees;
 - iv Students have a right to know which courses are transferable among the state public two-year and four-year institutions of higher education;
 - v Students, upon completion of core general education courses, regardless of the delivery method, should have those courses

satisfy the core course requirements of all Colorado public institutions of higher education;

- vi Students have a right to know if courses from one or more public higher education institutions satisfy the students' degree requirements;
- vii A student's credit for the completion of the core requirements and core courses shall not expire for ten years from the date of initial enrollment and shall be transferable.

Statewide Guaranteed Transfer of General Education Courses

As of fall 2003, the two-year and four-year transfer articulation agreements among Colorado institutions of higher education were replaced by a statewide guaranteed transfer of approved general education courses taken at any Colorado public institution of higher education. Under the statewide guaranteed transfer program, up to 31–33 credit hours of successfully (C- or better) completed course work will automatically transfer and apply towards graduation requirements at the receiving institution. The course work must be drawn from the list of approved guaranteed transfer courses and must meet the distribution requirements of the guaranteed transfer program. Further information about the statewide transfer program, including the list of approved courses and distribution requirements, can be found on the Colorado Department of Higher Education's Complete College Colorado! (<http://higher.ed.colorado.gov/Academics/Transfers/Students.html>) webpage.

As of fall 2006, a student graduating with an Associate of Arts or an Associate of Science degree from a Colorado community college and entering the College of Media, Communication and Information is exempt from the written communication requirement and the lower-division component of the core curriculum, with the exception of CMCI 1010 and CMCI 1020. Note that students are still subject to the MAPS requirements. Additional information on the evaluation of transfer credit of Colorado community college course work and its application in select arts and sciences major programs can also be found on the College of Arts & Sciences' Student Resources (<http://www.colorado.edu/artsandsocieties/student-resources>) webpage.

Students are required to follow the graduation requirements listed in this catalog at the time of their initial entry onto the Boulder campus.

Credit Policies

Advanced Placement Program

See the undergraduate Credit by Examination (p. 106) section.

International Baccalaureate

Any student admitted to a University of Colorado campus after June 30, 2003, who has graduated from high school having successfully completed an International Baccalaureate (IB) diploma, program will be granted 24 credit hours of college credit. No tuition will be charged for these credit hours. These credit hours will be granted, however, only if the student receives a score of 4 or better on an examination administered as part of the IB diploma program.

In addition, college credit is granted for International Baccalaureate examinations at the higher level with a score of 4 or better. For specific equivalencies, contact the Office of Admissions at 303-492-2458 or visit the International Baccalaureate (<http://www.ibo.org>) website.

Credit/No Credit

Credit/no credit changes must occur during the schedule adjustment periods each semester as outlined in the Registrar's academic calendar.

Credit Taken as a Nondegree Student

Once a student has been admitted to a degree program, credits from the Division of Continuing Education such as ACCESS, Boulder evening credit courses and CU Boulder correspondence classes may be eligible to be applied toward the degree. Students will receive initial advising during orientation once they have been accepted to a degree program in the College of Media, Communication and Information.

Cross-Listed Courses

Courses that are cross-listed in two or more departments are credited in the department in which the student has the most credit hours, irrespective of the department in which the student formally enrolled for the course.

Incomplete Grades

An I grade is given at the discretion of the course instructor only when a student has satisfactorily completed a substantial portion of a course and, for reasons beyond the student's control, is prevented from completing all work for the course within the term. Incomplete grades must be requested by the student and should not be awarded by the instructor for non-attendance. (In the case of nonattendance, the instructor should award the student the grade(s) earned.) If an incomplete grade is given, the instructor is required to document the reasons/grounds for the awarding of the incomplete grade, the specific work and conditions for completion of the course and the time frame within which the course work must be completed. The maximum time the instructor can allow for the completion of the course work and subsequent award of a course grade is one year from the end of the term the course was taken. After one year, if no final grade is awarded, the I will change to the grade of F. A copy of the Incomplete Agreement (forms are available from the dean's office) signed by the student and instructor and accompanied by documentation of the extenuating circumstances that resulted in the awarding of an incomplete should be filed with the Director of Advising's Office and a copy should be given to the student.

Independent Learning

A maximum of 30 credit hours of correspondence/online learning work may count toward the degree. CMCI and Arts and Sciences courses offered by the CU Boulder Division of Continuing Education carry resident credit.

Independent Study

With departmental approval, students may register for independent study during the normal registration periods for each semester. Students may not register for more than 6 credit hours of independent study credit during any term. No more than 8 credit hours of independent study taken in a single department or program can be applied toward the total credit hours needed for graduation. A maximum of 16 credit hours of independent study may count toward the degree. The minimum expectation for each hour of credit is 25 hours of work.

A student may not use independent study projects to fulfill the college's general education requirements. Some departments further restrict the use of independent study hours toward meeting major requirements.

Repetition of Courses

If a student takes a course for credit more than once, all grades are calculated into the grade point average. However, the course is only

counted toward graduation once, unless a course description specifically states that it can be taken more than once for credit.

ROTC Credit

The ROTC courses listed below have been certified as acceptable college-level course work by the faculty of the College of Arts and Sciences or by other colleges and schools on the Boulder campus. These courses are counted as elective credit toward the degree. Courses not included on this list do not count toward any degree requirements. Transfer ROTC course work must be evaluated as equivalent to course work on this list to count toward degree requirements.

AIRR 3010 & AIRR 3020	Air Force Leadership Studies I and Air Force Leadership Studies II	6
AIRR 4010 & AIRR 4020	National Security Affairs/Preparation for Active Duty and National Security Forces in Contemporary American Society 2	6
MILR 1011 & MILR 1021	Adventures in Leadership 1 and Adventures in Leadership 2	4
MILR 2031 & MILR 2041	Methods of Leadership and Management 1 and Methods of Leadership and Management 2 (students may not receive credit for either course if they have credit in OPMG 3000)	6
MILR 4072 & MILR 4082	Leadership 1: Adaptive Leadership and Leadership 2: Leadership in a Complex World	6
NAVR 2020	Seapower and Maritime Affairs	3
NAVR 3030	Naval Engineering Systems	3
NAVR 3040	Weapons and Systems Analysis	3
NAVR 3101	Evolution of Warfare	3
NAVR 4010 & NAVR 4020	Leadership and Management and Leadership and Ethics	6
NAVR 4030	Navigation	3
NAVR 4101	Amphibious Warfare	3

Withdrawal

See the Registration & Enrollment (p. 22) section for campuswide policies and withdrawal procedures.

Students in the College of Media, Communication and Information who withdraw two semesters in a row will have a dean's stop placed on their registration. Summer session is not counted as a regular semester. They will not be permitted to return to CU Boulder before one full academic year has elapsed (not including their semester of withdrawal). CMCI students may withdraw from all classes for a term until the last day that classes are taught by requesting withdrawal through the Office of the Registrar. Students cannot withdraw after classes have ended for a term except through the retroactive withdrawal process outlined in the Registration & Enrollment (p. 22) section.

These policies also apply to CMCI students who are enrolled in Continuing Education courses.

Students are encouraged to apply for leave of absence benefits with the Office of the Registrar when their withdrawal from the university is temporary. For more information, see the Registration & Enrollment (p. 22) section.

Readmission

CMCI students who request readmission to the college are always readmitted to their major of record at the time they last attended the

university. Readmitted students who desire to pursue a major different from their major of record must follow the new college's process for declaring a major after they have been readmitted.

Core Curriculum

Mission Statement

The Core Curriculum blends liberal arts learning with skills necessary for success in careers involving media, communication and information. It aims to cultivate ways of thinking and doing that serve the educational, vocational and citizenship needs of CMCI students. To these ends, the curriculum promotes expression, collaboration and critical literacy across multiple forms of communication—from speech and writing to computing and visual media. Those skills underwrite learning across the humanities, the arts and the social and natural sciences, insuring educational breadth. The Core Curriculum matches that breadth with focus through a secondary area of study that students choose to supplement their major—a double degree, a double major, a minor, or academic certificate. Through designated history and diversity courses, the curriculum equips students to live in globalizing worlds, consider issues from multiple perspectives and engage in long-term thinking beyond the contemporary moment. Finally, the curriculum promotes both intellectual cohesion and independent learning through an introductory Common Experience course for all students and specialized Capstone Experiences tailored to particular majors and interests.

Educational Goals

The Core Curriculum is designed to help CMCI students master ways of doing, thinking and investigating essential to studying and working in media, communication and information fields. These competencies may be studied and practiced in course work either within or outside the college. Graduates of the college are expected to be able to demonstrate competence in the following:

- Multi-modal composition and expression: being able to use written, spoken, visual and digital media for effective expression, argumentation and communication of ideas and sentiments to audiences.
- Collaboration, design and creative problem solving: being able to work effectively and inventively with others in complex problem solving and design tasks.
- Communicative interaction: being able to look at phenomena from the perspective of symbolic and material interchanges among individuals, collectives and institutions.
- Media literacies: being able to interpret and critically analyze messages and formal conventions (genres, grammars, logics) in multiple modes and media of communication (visual, sonic, discursive) and to consider them from the perspectives of their audiences, political economies and histories.
- Quantitative and computational thinking: being able to approach and solve problems quantitatively and algorithmically, and to apply and utilize computing models and resources when advantageous.
- Institutional and organizational understanding: being able to consider problems, policies and collective action from the perspectives of different institutions and organizations—e.g., political, legal, economic and religious.
- Cultural understanding: being able to consider problems and social experiences comparatively, considering different global and domestic cultures, with attention to categories of race, class, ethnicity, religion, gender and sexuality.

- Historical understanding: being able to consider social, cultural, intellectual, technological and/or institutional phenomena in historical perspective.
- Ethical action: being able to recognize moral issues, deliberate intelligently about them and uphold the ethical standards of particular disciplines and practices.

Design of the Core Curriculum

The Core Curriculum is designed to be both flexible and comprehensive. While promoting a shared mission and identity for CMCI students through a set of college requirements, the Core Curriculum also promotes breadth and porosity of learning across all the schools and colleges of the CU Boulder campus. Most of the core requirements may be taken either within or outside the college, and many are covered by a student's major. Students who wish to double degree in a CMCI discipline and a discipline outside CMCI will find that the CMCI Core Curriculum dovetails almost entirely with the core or breadth requirements of other CU Boulder colleges and schools.

Core Curriculum at a Glance

College Requirements

Common Experience: 2 courses + 2 labs/studios	8
Capstone Experience: 1 course	3
Secondary Area of Study outside the major	variable

Breadth Requirements

Composition and Expression: 2 courses:	6
Lower-division writing	
Upper-division composition	
Quantitative Thinking: 1 course	3
Computing: 1 course	3
Foreign Language: third-year high school or third-semester college proficiency	0-3
The Natural World: 2 courses + a lab	7
People and Society: 2 courses	6
Humanities and the Arts: 2 courses	6

Point-of-View Requirements

Historical Views: 2 "H" designated courses (0–6 additional credit hours)	0-6
Diversity and Global Cultures: 2 "D" designated courses (0–6 additional credit hours)	0-6

Total Credit Hours	42-57
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College Requirements

1. A **Common Experience** course sequence—CMCI 1010 and CMCI 1020: lectures + lab/studio (2 courses). This course sequence introduces shared themes, values, ethical issues and competencies across the college and emphasizes the marriage of study and practice that will be the hallmark of CMCI as a whole. Each course is structured as a lecture plus a lab/studio in which students create projects putting the lecture's ideas into practice by means of writing, speaking, design, visual presentation and other modes of expression, and by means of collaborative and active learning.
2. An upper-division **Capstone Experience**: scholarly, lab-based or studio-based (1 course, 3–4 credit hours). This course fosters students' research, creative work, service learning and/or invention, and may include teamwork as well as individual achievement. This course may

be taken within the major, or it may be offered as an interdisciplinary option.

3. An **Secondary Area of Study** outside the major (variable credit hours). Defined as a double degree, second major, a minor, or an academic certificate, this sequence of courses helps students develop the intellectual versatility necessary for successful study and work in media, communication and information fields.

Breadth Requirements

NB: Breadth requirements may be satisfied either within or outside the college. They may also overlap with requirements for individual majors.

1. **Composition and Expression** (2 courses, 6 credit hours):
 - a. Lower-division writing (3 credit hours). This course develops the foundational skills in written expression expected of every CU Boulder graduate.
 - b. Upper-division visual, digital, verbal, written and/or media composition (3 credit hours). This course requirement emphasizes the many alternative forms of composition and expression that CMCI students cultivate.
2. **Quantitative Thinking** (1 course, 3 credit hours): This course provides students with the ability to think at a certain level of abstraction, to manipulate symbols and to assess adequately the data that will confront them in their course work and in their daily lives.
3. **Computing** (1 course, 3 credit hours): This course introduces students to the basic principles of computing, including computational architectures and logic, coding and scripting, issues in technical project management and issues in human-centered technology design.
4. **Foreign Language** (3 credit hours): This requirement encourages students to comprehend the structure and vocabulary of a language other than their native one, to read significant and difficult works in that language and to understand aspects of the culture(s) lived in that language. This requirement may be met at the time of matriculation by fulfilling the MAPS requirement of high school, third-level proficiency in a single language. Students who lack the MAPS requirement must pass an appropriate third-semester college course or a CU Boulder–approved proficiency examination.
5. **The Natural World** (2 courses + lab, 7 credit hours): These courses study the nature of matter, life and the universe. They enhance literacy and knowledge of one or more disciplines in the natural or physical sciences, and enhance the reasoning and observing skills necessary to evaluate issues with scientific content. A laboratory or field experience helps students gain hands-on experience with scientific research, develop observational skills of measurement and data interpretation and learn the relevance of these skills to the formation and testing of scientific hypotheses.
6. **People and Society** (2 courses, 6 credit hours): These courses introduce students to the study of social groups, including social institutions and processes and the forces that mold and shape social groups, including values, beliefs, communication processes and organizational principles. They prepare students to approach social phenomena of all kinds in an informed and critical way; to describe, analyze, compare and contrast social phenomena; and to analyze their own sociocultural assumptions and traditions.
7. **Humanities and the Arts** (2 courses, 6 credit hours): These courses foster students' understanding of fundamental aesthetic, cultural, literary, philosophical and theological issues. They sharpen critical and analytical abilities so that students may develop a deeper

appreciation of works of art and literature and of philosophical, ethical and religious ideas and belief systems.

Point-of-View Requirements

NB: Point-of-view requirements may be satisfied either within or outside the college, but at a minimum three of the 12 credit hours must be within CMCI. They may also overlap with breadth requirements and/or major requirements. In addition, a single course may be designated both "H" and "D."

1. **Historical Views** (2 "H" designated courses, 0–6 additional credit hours). This requirement enables students to understand that every contemporary issue has a history, and that an understanding of historical context and change is essential to an understanding of the contemporary moment. "H" designated courses emphasize longitudinal thinking and the investigation of the processes and the meanings of change over time.
2. **Diversity and Global Cultures** (2 "D" designated courses, 0–6 additional credit hours). This requirement increases students' understanding of the world's diversity and pluralism. "D" designated courses study some aspect of two broad and interrelated areas:
 - a. the nature and meaning of diversity and the experience of groups marginalized because of their race, ethnicity, gender, sexuality or other characteristics; and
 - b. cultures other than those of Europe and the United States.

Academic Advising and Responsibilities

Students in the college are expected to assume responsibility for planning their academic program in conjunction with their academic advisor in accordance with college rules and policies and with departmental major requirements. Any questions concerning these provisions are to be directed to the student's academic advisor. The college cannot assume responsibility for problems resulting from students failing to follow the policies stated in the catalog or from incorrect advice given by someone other than an appropriate staff member of the college.

All new students are required to attend a special orientation, advising and registration program on campus before enrolling.

Advising

Academic advising is an integral part of undergraduate education. The goal of all academic advising is to help students make responsible decisions as they develop educational plans compatible with their potential and with their career and life goals. Advising is more than the sharing of information about academic courses and programs; it includes encouraging students to formulate important questions about the nature and direction of their education and working with them to find answers to those questions. Advisors confer with students about alternative course schedules and other educational experiences, but students themselves are responsible for selecting the content of their academic program and making progress toward an academic degree.

As students progress through their academic program, their questions and concerns change. CU Boulder offers a system of faculty, professional academic advisors and peer advisors to address these ongoing and multifaceted concerns.

Students are ultimately responsible for choosing appropriate courses, for registering accurately and for meeting all degree requirements. Academic advisors assist students in clarifying their interests, values and goals

and help students relate these to academic programs and educational opportunities. As students work with their advisors, the advisors help students develop a coherent and balanced program of study that fulfills graduation requirements and assist students in identifying and integrating into their programs educational experiences outside the classroom that enhance their personal, intellectual and professional development. Academic advisors also assist students in understanding academic policies, requirements, procedures and deadlines.

Responsibilities of Students and Advisors

Within the advising system on the Boulder campus, both students and advisors have responsibilities.

Students are responsible for:

1. knowing the requirements of their particular academic program, selecting courses that meet those requirements in an appropriate time frame, registering accurately and monitoring their progress toward graduation;
2. consulting with their academic advisor several times every term;
3. scheduling and keeping academic advising appointments in a timely manner throughout their academic career, so as to avoid seeking advising only during busy registration periods;
4. being prepared for advising sessions (for example, by bringing in a list of questions or concerns, having a tentative schedule in mind and/or being prepared to discuss interests and goals with their advisor);
5. knowing and adhering to published academic deadlines;
6. monitoring their position on registration waitlists; and
7. reading their CU email on a weekly basis.

Advisors are responsible for:

1. helping students clarify their values, goals and abilities;
2. helping students understand the nature and purpose of a college education;
3. providing accurate information about educational options, requirements, policies and procedures;
4. helping students plan educational programs consistent with the requirements of their degree program and with their goals, interests and abilities;
5. assisting students in the continual monitoring and evaluation of their educational progress; and
6. helping students locate and integrate the many resources of the university to meet their unique educational needs and aspirations.

General Graduation Requirements

CMCI students must fulfill the following requirements for graduation:

1. Pass a total of 120 credit hours.
2. Maintain a 2.00 overall grade point average and a 2.00 grade point average in CMCI major coursework.
3. All courses taken for the major requirements must be passed with a C- or better.
4. Pass 45 credit hours of upper-division work.
5. Complete a minimum of 45 credit hours in University of Colorado courses on the Boulder campus. Of these 45 credit hours, a minimum of 30 credit hours must be upper division credit hours completed as a matriculated student in CMCI. Six of the 45 credit hours may be taken at other University of Colorado campuses. Courses taken while on CU Boulder study abroad programs, through CU Boulder continuing

education or CU Boulder correspondence courses are considered to be in residence.

6. Complete a major offered by the College of Media, Communication and Information. Students are subject to the major requirements in force when they declare the major.
7. Complete the CMCI core and MAPS requirements.

Programs of Study Advertising, Public Relations and Media Design

Advertising, Public Relations and Media Design (APRD) strives to produce leaders in the area of strategic communication who have mastered a design-thinking process grounded in analytical and creative thought. We believe in amplifying our students' curiosity, increasing their tolerance for risk and encouraging them to look at life and a career with an entrepreneur's eye for opportunity. APRD is committed to providing students the necessary tools and techniques to think critically, adapt, create and above all lead in a rapidly changing media world.

Our goal is to help students acquire the kind of in-depth expertise in at least one area of strategic communication and design that will enable them to generate ideas and solve problems for a variety of organizations, including but not limited to ad agencies, PR firms, publishing and design firms, nonprofits, start-ups and personal ventures. We produce graduates who are forward-looking and have a deep interest in and knowledge of diverse cultures both within the United States and throughout the world.

Advertising, Public Relations and Media Design actively encourages students to enroll in courses offered both within and outside CMCI. Similarly, many of our courses are open to students in other units on the grounds that the design-thinking process can be used to solve problems in a wide variety of disciplines.

Course code for this program is APRD.

Bachelor's Degree

- Strategic Communication - Bachelor of Science (BS) (p. 774)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Duncan, Thomas R.
Professor Emeritus

Gangadharbatla, Harsha (https://experts.colorado.edu/display/fisid_153279)
Associate Professor; PhD, University of Texas at Austin

Logan, Kelty Irene (https://experts.colorado.edu/display/fisid_147340)
Associate Professor; PhD, University of Texas at Austin

Moriarty, Sandra E.
Professor Emeritus

Robbs, Brett
Professor Emeritus

Schauster, Erin E (https://experts.colorado.edu/display/fisid_156310)
Assistant Professor; PhD, University of Missouri-Columbia

Slayden, David Lee (https://experts.colorado.edu/display/fisid_113297)
Associate Professor; PhD, Indiana University Bloomington

Willis, Erin N (https://experts.colorado.edu/display/fisid_156068)
Assistant Professor; PhD, University of Missouri-Systems office

APRD 1000 (3) Creative Industries

Explores creative and strategic thinking and the many industries involved in creating brand communication as well as these industries growing interdependence in a changing media landscape. Considers technology's impact and the effect of commercial culture on an increasingly diverse society.

APRD 1001 (3) Creative Concepts

Introduces students to a disciplined process that is used to create innovative solutions across commercial communication fields. Emphasizes approaches to problem identification and solution that combine research and human insight with a variety of creative thinking techniques. Topics include need finding, structured brainstorming, rapid sketching, storytelling and visual communication.

Requisites: Requires a prerequisite course of APRD 1000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 1002 (3) Introduction to Branding

Designed to help students acquire a basic understanding of brand and brand culture. Emphasis on theories and practical problems to learn effective ways of building a strong brand strategy. Encompasses every facet of making strategic decisions for a brand. Involves understanding the content a consumer requires, how the consumer will come in contact with the brand and what is the goal of the relationship between consumer and content.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 1050 (3) Digital Media Production for Strategic Communicators

Provides intensive training in the theory and skills necessary to create compelling strategic communication content for a variety of digital media platforms and channels. Students will gain hands-on experience writing and producing content for the web, including video, infographics, podcasts, blogs and social media.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 2000 (3) Principles of Advertising

Explores the practice of advertising from a variety of viewpoints including advertisers, agencies and the public. Students will examine advertising via successful campaigns for some of the world's most iconic brands. Topics include history and evolution of the industry, the process of creating ideas in a multi-disciplinary world and challenge of advertising to act ethically and responsibly within society. Cannot be taken concurrently with APRD 2002 or APRD 2003.

Requisites: Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 2002 (3) Principles of Public Relations

Overview of public relations practice and theory including history, media channels and relations, legal and ethical concerns, international and diverse perspectives, and career options. Cannot be taken concurrently with APRD 2000 or APRD 2003.

Requisites: Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 2003 (3) Principles of Design

Provides a comprehensive survey of the ideas, events, and individuals that determined the design of information, objects, culture, and commerce across societies. Students will examine the social, political and cultural contexts that have shaped media design and the ideologies and relationships of similar movements in art and architecture. Cannot be taken concurrently with APRD 2000 or APRD 2002.

Requisites: Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3000 (3) Intermediate Creative Concepts

Explores both strategic and creative thinking and examines approaches to narrative storytelling as a tool for telling overarching brand stories. Students use the foundation to develop creative briefs and advertising campaigns. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3001 (3) Intermediate Design Concepts

Students are introduced to design elements and principles, research and visual storytelling. They are challenged to communicate intellectual, sensory and emotional concepts by learning a visual vocabulary of type, color, and form expressed in a variety of mediums and dimensions.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3002 (3) Communication Platforms

Explores cross-channel media consumption (television, print, radio, Internet, product placement, word-of-mouth, etc.) and developing evaluative techniques to choose media that will most effectively implement a brand strategy; allows students to learn how to utilize different forms of media in the context of integrated brand communication.

Requisites: Requires a prerequisite course of APRD 2000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 3003 (3) Strategic Communication Research Methods

Provides an opportunity to use and master quantitative and qualitative research methods. Students conduct research and analyze data to determine the target relationship with specific product categories and identify the emotional and practical needs that create brand relationships.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3004 (3) Account Management

Examines managerial and decision making processes of advertising and related brand communication functions. Emphasis on determining opportunities, integrating with other elements of the promotion mix, setting objectives, establishing budgets, and measuring advertising and communication effectiveness.

Requisites: Requires a prerequisite course of APRD 2000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 3005 (3) Content Strategy and User Engagement

Explore and understand the importance of content as a brand building tool. Students will gain the ability to use analytics to create strategy that allows the brand to have meaningful and cohesive conversation with its community.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3006 (3) History of Advertising

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-).

Grading Basis: Letter Grade

APRD 3007 (3) Curiosity for Strategists

Introduces students to the practice of curiosity as the basis of creative problem solving. Students will participate in exercises and exploration based projects to increase productive curiosity, critical thinking and creative products, which will inform the development of integrated marketing communication campaigns.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3008 (3) Qualitative Research Methods

Exposes students to the principles and methods of qualitative methodology including interviews, focus groups and ethnography. Explores how these methods inform the practice of strategic communication.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3100 (3) Design for Digital Media

Explores how to create and produce effective and engaging designs for dynamic information across a variety of screens while maintaining brand identity. Extending the design principles learned in previous classes, the student will concept for user interfaces (UI) and navigational frameworks that optimize usability, accessibility.

Requisites: Requires prerequisite course of APRD APRD 3001 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3102 (3) Story Design I

Explores the development of interactive concepts that meet the strategic brief's brand objectives. Emphasis is placed first on developing strong digital ideals. Students also master the styles appropriate for different digital media and then use those skills.

Requisites: Requires prerequisite course of APRD 2000 or APRD 2002 or APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3103 (3) Strategic Writing for Public Relations

Emphasis on communication tactics; plan, write and execute public relation tools; audience segmentation; media selection; application of social media channels.

Requisites: Requires a prerequisite course of APRD 2002 (minimum grade C-).

APRD 3112 (3) International Public Relations

Introduces students to the cultural, social and economic issues relevant to strategic communication in the global arena. Provides students with the foundational tools necessary to both understand and effectively navigate the often complex world of strategic intercultural communication. Specific topics will include exploration of the contextual factors that influence public relations practice in different nations/ regions, discussion of the various theoretical models that govern global PR practice and critical evaluation of international PR case studies/ campaigns.

Requisites: Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3300 (3) Crisis Communication in Public Relations

Explores theories and research related to public relations communication before, during and after a crisis; examines the fundamentals of organizational communication, crisis management and strategic planning.

Requisites: Requires prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3301 (3) Social Media Strategies for Public Relations

Emphasis on how social media and internet marketing influence public relations; understand the fundamentals and best practices in social media management, visual communication and mobile applications.

Requisites: Requires prerequisite course of APRD 2000 or APRD 2002 or APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3302 (3) Case Studies in Public Relations

Designed to help develop and refine critical thinking in selecting, creating and applying tools, techniques and principles of public relations to a variety of managerial cases and problem situations.

Requisites: Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3304 (3) History of Advertising

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3500 (3) Story Design II

Explores the uses of story and how the design of story must adapt to different platforms and genres, including both short- and long-form narratives, visual narrative, film, personal essay and advertising copy writing.

Requisites: Requires a prerequisite course of APRD 3102 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3700 (1-3) Field Study in Strategic Communication

Creates an immersive experience for students in regards to the history, business practices and current thinking of top industry companies. Students will first complete course work at CU Boulder and then travel to major industry hubs to visit advertising, design, PR and other marketing communication companies.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to College of Media, Communication Information (CMCI) or Business (BUSN) majors only with 60-180 units completed.

APRD 4000 (3) Public Relations Event Planning

Introduces students to the planning and execution of special events. Specifically, the course will locate special event planning within the broader context of organizational strategy and will introduce students to project management through proposal development, scheduling, budgeting and evaluation components that underlie successful event production. Will culminate in the execution of a full-scale event near the end of the semester.

Requisites: Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 4010 (3) Strategic Health Communication

Introduces students to theory, research and contemporary concerns in health communication. Focuses on strategic communication for public service and public education campaigns related to health. Includes advertising and health promotion, community relations, public service programs, advocacy, online communities and social media management.

Requisites: Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 4100 (3) Brands and Culture

Explores the intersection between culture and marketing communication. Students will examine brand communities, brand and category culture as well as popular culture and the impact on and within marketing communication. The goal is for students to become more aware of the importance of culture in the ability of communication to disrupt the status quo within a market.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4101 (3) Advertising Media Planning

Examine how owned, earned and paid (or traditional and non-traditional) media campaigns are planned, budgeted, executed and evaluated.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4102 (3) Sustainable Brand Practices: Ethics Cases in Advertising and PR

Explore contemporary issues and ethics cases in advertising and public relations and how these practices impact the long-term success of a brand. Students will explore branding concepts and theories of ethics to examine some of the current controversies in which advertising and public relation campaigns are involved and how these issues can be dealt with in an ethical and socially responsible manner.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4300 (3) Strategic Communication Analytics and Metrics

Provide students with a base knowledge of analytics and metrics used in strategic communication. Students will learn how to obtain and clean big data, how to analyze and turn it into insights and how to present and communicate insights into actionable recommendations.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4403 (4) Strategic Communication Campaigns

Gives students the opportunity to work in small groups to develop material for an actual client. Examines basic principles of group dynamics and effective teamwork while conducting research, developing strategies and creating a multimedia campaign. All work is presented to the client.

Requisites: Requires prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 or JOUR 3503 or JOUR 3463 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only with a minimum of 85 hours.

Additional Information: Departmental Category: Advertising Media Design

APRD 4404 (3) Advanced Ad Campaigns NSAC

Work and design an ad campaign for a real world client through the National Student Advertising Competition (NSAC).

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 (minimum grade C-).

Restricted to Strategic Communication (STCM) majors only with a minimum of 80 hours completed.

Grading Basis: Letter Grade

APRD 4453 (3) Advertising and Society

Examines criticisms and contributions of advertising in society and the economy.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) students with a minimum of 73 hours taken.

Additional Information: Departmental Category: Advertising Media Design

APRD 4501 (3) Design for Social Innovation

Provides an introduction to design thinking as a means to drive social change and solve real-world problems. This studio class is project based and asks students to experiment with new behaviors of work and learning, including: collaboration, iteration, prototyping, empathizing, craft and inference. Field work and collaboration with teammates are required.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4503 (3) Portfolio 1

Enhances student conceptual abilities and generates both print and integrated multimedia campaigns. Students work in teams to develop an extensive body of work that's exhibited in an awards show judged by advertising professionals. Instructor consent required.

Requisites: Requires a prerequisite course of APRD 3000 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Additional Information: Departmental Category: Advertising Media Design

APRD 4523 (3) Portfolio 2

Gives students an opportunity to develop an extensive body of work. Students create integrated campaigns, which include print, digital and guerilla ideas. Final portfolios are critiqued by both faculty and outside reviewers. Instructor consent required.

Requisites: Requires a prerequisite course of APRD 4503/JOUR 4503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Additional Information: Departmental Category: Advertising Media Design

APRD 4543 (3) Strategic Brand Management

Examines the theory of branding: what brands are, how brands are created and measured, as well as strategies for managing brands and brand communication.

Requisites: Requires a prerequisite course of APRD 3002 or APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Additional Information: Departmental Category: Advertising Media Design

APRD 4600 (3) Design Portfolio I

Develop a variety of design concepts and execute them at a professional level. Students are assigned projects typical of those handled by design firms to demonstrate their ability in areas such as branding, product design, interaction design, etc. Students will also design their own online portfolio. Creative work is presented in a juried show at the end of the semester. Department requisite: students must apply with a portfolio, the quality will determine enrollment.

Requisites: Requires a prerequisite course of APRD 3001 (minimum grade C-).

Grading Basis: Letter Grade

APRD 4601 (3) Design Portfolio II

Refine the skills learned in APRD 4600 and further development of work at a professional level. With help from visiting professionals, students continue to develop a body of work that provides their mastery of user-centered design and branding across a variety of real-world assignments. The final portfolio is judged in the student creative show, juried by design professionals. Department prerequisite: students must apply with a portfolio, the quality will determine enrollment.

Requisites: Requires a prerequisite course of APRD 3001 (minimum grade C-).

Grading Basis: Letter Grade

APRD 4700 (3) Advertising Intensive

Immerses students in the process of creating successful communication and deepens their understanding of current industry standards and practices. Students will learn, develop and execute all aspects of the communication process under the guidance of professionals. Offered Maymester only.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APRD 4873 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU), Program in Journalism Mass Communication (JOURU) or Strategic Communication (STCM) majors only.

Additional Information: Departmental Category: Advertising Media Design

APRD 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Strategic Communication - Bachelor of Science (BS)

Strategic communication is an umbrella term covering all three undergraduate tracks offered by the department. The tracks from which students may choose are:

1. Advertising
2. Public Relations
3. Media Design

Requirements

Each degree track requires 34 credit hours, comprised of the 19-credit-hour departmental Core Curriculum and 15 credit hours of specialized course work. The courses of specialized studies include Strategic Communication Campaigns (APRD 4403), a 4-credit-hour capstone course completed in the student's final year.

Core Curriculum

Students must take the following courses to complete the department core requirement.

Required Courses and Semester Credit Hours

1st Semester		
APRD 1000	Creative Industries	3
2nd Semester		
APRD 1001	Creative Concepts	3
APRD 1002	Introduction to Branding	3
Anytime after 2nd Semester		
JRNL 3651	Media Law and Ethics	3
APRD 4931	Internship (anytime after 3rd semester: at least 3 credit hours)	3
7th and 8th Semesters		
APRD 4403	Strategic Communication Campaigns (plus 1 credit hour of lab/workshop)	4
Total Credit Hours		19

Media Design and Creative Advertising Track

The media design and creative advertising track consists of two required courses and three electives totaling 15 credit hours. All media design students are also required to maintain an online portfolio of their work. A portfolio review is required for graduation.

Required Courses and Semester Credit Hours

3rd Semester

APRD 2003	Principles of Design	3
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4th Semester

Select one of the following:		3
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APRD 3000	Intermediate Creative Concepts (suggested for all creative advertising majors)	
APRD 3001	Intermediate Design Concepts (suggested for design majors)	

4th through 8th Semesters

EITHER three required electives offered by APRD under the Media Design track, OR one of three suggested pathways:		9
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1. Creative Advertising - Copywriting:

APRD 3500	Story Design II	
APRD 3102	Story Design I	
APRD 4503	Portfolio 1	
APRD 4523	Portfolio 2	

2. Creative Advertising – Art Direction:

APRD 3001	Intermediate Design Concepts	
APRD 3100	Design for Digital Media	
APRD 4503	Portfolio 1	
APRD 4523	Portfolio 2	

3. Media Design:

APRD 3100	Design for Digital Media	
Branding and Identity Systems		
APRD 4600	Design Portfolio I	
APRD 4601	Design Portfolio II	

General Electives:

APRD 2000	Principles of Advertising	
APRD 2002	Principles of Public Relations	
APRD 3001	Intermediate Design Concepts	
APRD 3100	Design for Digital Media	
APRD 3102	Story Design I	
APRD 3500	Story Design II	
APRD 4503	Portfolio 1	
APRD 4523	Portfolio 2	
APRD 3700	Field Study in Strategic Communication	
APRD 4501	Design for Social Innovation	
APRD 4600	Design Portfolio I	
APRD 4601	Design Portfolio II	
APRD 4700	Advertising Intensive	

Design History

Branding and Identity Systems

Design Research

Information Visualization

The Entrepreneurial Mindset

Leadership: Styles and Situations

Imagining Futures

Design Psychology

Designing User Experience

Total Credit Hours		15
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Strategic Advertising Track

The strategic advertising track consists of two required courses and three electives totaling 15 credit hours. All strategic students are also required to maintain a portfolio of their work. A portfolio review is required for graduation.

Required Courses and Semester Credit Hours

3rd Semester

APRD 2000	Principles of Advertising	3
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4th through 8th Semesters

Select one of the following:		3
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APRD 3002	Communication Platforms (suggested for media planning)	
APRD 3003	Strategic Communication Research Methods (suggested for account planning)	
APRD 3004	Account Management (suggested for account management)	

EITHER 3 electives offered under the Strategic Advertising track OR one of two suggested pathways:		9
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1. Account Management:

APRD 3002	Communication Platforms	
APRD 3003	Strategic Communication Research Methods	
APRD 4300	Strategic Communication Analytics and Metrics	

2. Account Planning:

APRD 3008	Qualitative Research Methods	
APRD 3007	Curiosity for Strategists	
or APRD 4106 Brands and Culture		
APRD 4102	Sustainable Brand Practices: Ethics Cases in Advertising and PR	

3. Media Planning:

APRD 3005	Content Strategy and User Engagement	
APRD 4101	Advertising Media Planning	
APRD 4300	Strategic Communication Analytics and Metrics	

Advertising Electives:

APRD 2002	Principles of Public Relations	
APRD 2003	Principles of Design	
APRD 3002	Communication Platforms	
APRD 3003	Strategic Communication Research Methods	
APRD 3004	Account Management	
APRD 3005	Content Strategy and User Engagement	
APRD 3006	History of Advertising	
APRD 3007	Curiosity for Strategists	
APRD 3008	Qualitative Research Methods	
APRD 3700	Field Study in Strategic Communication	
APRD 4100	Brands and Culture	
APRD 4102	Sustainable Brand Practices: Ethics Cases in Advertising and PR	
APRD 4300	Strategic Communication Analytics and Metrics	
APRD 4300	Strategic Communication Analytics and Metrics	
APRD 4543	Strategic Brand Management	
APRD 4700	Advertising Intensive	

Total Credit Hours		15
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Public Relations Track

The public relations track consists of three required courses and two electives totaling 15 credit hours. All PR students are required to maintain a portfolio of their work. A portfolio review is required for graduation.

Required Courses and Semester Credit Hours

3rd Semester

APRD 2002	Principles of Public Relations	3
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4th through 7th Semesters

APRD 3003	Strategic Communication Research Methods	3
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APRD 3103	Strategic Writing for Public Relations	3
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4th through 8th Semesters

Two electives offered under the Public Relations track:		6
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Public Relations Electives:

Strategic Planning Cases in PR

APRD 2000	Principles of Advertising
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APRD 2003	Principles of Design
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APRD 3300	Crisis Communication in Public Relations
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APRD 3301	Social Media Strategies for Public Relations
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APRD 3302	Case Studies in Public Relations or APRD 430 Strategic Communication Analytics and Metrics
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APRD 3700	Field Study in Strategic Communication
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APRD 4102	Sustainable Brand Practices: Ethics Cases in Advertising and PR
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General Electives:

COMM 3320	Persuasion in Society
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COMM 2600	Organizational Communication
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COMM 1300	Public Speaking
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COMM 3310	Principles and Practices of Argumentation
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PR and Society

History of Advertising and Public Relations

Social Media Strategies

PR Law and Ethics

Total Credit Hours		15
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Secondary Area of Study

In addition to coursework required for the major, all students in STCM must complete a secondary area of study outside of STCM. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree, or any credit-based certificate program of at least 12 credit hours.

Communication

The Bachelor of Arts in communication provides analytic work from both humanistic and social-scientific perspectives, and practical work to improve communication performance in various kinds of situations.

The undergraduate degree in communication emphasizes knowledge and awareness of:

- the basic contexts in which communication is enacted (e.g., interpersonal, group, organizational and public contexts);
- the various processes of interaction within these contexts;
- the basic methods of investigating questions about communication;
- the ethical issues and responsibilities of communication practice;

- the diversity of communication styles associated with gender and cultural differences;
- the uses and implications of communication technology; and
- the history and development of communication as an object of scholarly study, including both the humanistic and social-scientific traditions.

In addition, students completing the degree in communication are expected to acquire the ability and skills to:

- express ideas in an informed, coherent and effective manner, particularly the ability to articulate and develop a sustained argument, both orally and in writing;
- analyze, criticize and evaluate messages and interactions in a variety of practical contexts, both orally and in writing; and
- adapt messages and negotiate interactions responsibly in diverse and changing situations.

There are optional programs in which students are encouraged to participate such as study abroad, internships and graduating with honors.

Course code for this program is COMM.

Bachelor's Degree

- Communication - Bachelor of Arts (BA) (p. 779)

Minor

- Communication - Minor (p. 780)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackerman, John Martin (https://experts.colorado.edu/display/fisid_144951)

Associate Professor; PhD, Carnegie Mellon University

Ashcraft, Karen Lee (https://experts.colorado.edu/display/fisid_147453)
Professor; PhD, University of Colorado Boulder

Boromisza-Habashi, David (https://experts.colorado.edu/display/fisid_145833)
Associate Professor; PhD, University of Massachusetts at Amherst

Bowers, John Waite
Professor Emeritus

Campbell, Kathleen G.
Professor Emeritus

Craig, Robert T.
Professor Emeritus; PhD, Michigan State University

Darnell, Donald K.
Professor Emeritus

Deetz, Stanley A.
Professor Emeritus; PhD, Ohio University

Donald, Darnell K.
Professor Emeritus

Flores, Lisa A. (https://experts.colorado.edu/display/fisid_145474)
Associate Professor; PhD, University of Georgia

Frey, Lawrence R. (https://experts.colorado.edu/display/fisid_125937)
Professor; PhD, University of Kansas

Gries, Laurie Ellen (https://experts.colorado.edu/display/fisid_155951)
Assistant Professor; PhD, Syracuse University

Hauser, Gerard A.
Professor Emeritus

Hickerson, Ruth Lynne (https://experts.colorado.edu/display/fisid_151159)
Instructor; PhD, University of Denver

Jahn, Jody L (https://experts.colorado.edu/display/fisid_153426)
Assistant Professor; PhD, University of California-Santa Barbara

Koschmann, Matthew A. (https://experts.colorado.edu/display/fisid_145807)
Associate Professor; PhD, University of Texas at Austin

Kuhn, Timothy R (https://experts.colorado.edu/display/fisid_118144)
Professor; PhD, Arizona State University

Motter, Jeffrey Brian (https://experts.colorado.edu/display/fisid_156154)
Instructor; PhD, Indiana University Bloomington

Pezzullo, Phaedra Carmen (https://experts.colorado.edu/display/fisid_156204)
Associate Professor; PhD, University of North Carolina Chapel Hill

Simonson, Peter D. (https://experts.colorado.edu/display/fisid_143251)
Professor; PhD, University of Iowa

Skerski, Jamie L (https://experts.colorado.edu/display/fisid_149871)
Senior Instructor; PhD, Indiana University Bloomington

Sprain, Leah MH (https://experts.colorado.edu/display/fisid_151292)
Assistant Professor; PhD, University of Washington

Striphas, Theodore G. (https://experts.colorado.edu/display/fisid_156205)
Associate Professor; PhD, University of North Carolina Chapel Hill

Taylor, Bryan Copeland (https://experts.colorado.edu/display/fisid_107421)
Professor; PhD, University of Utah

Tompkins, Elaine V.
Professor Emeritus

Tompkins, Phillip K.
Professor Emeritus

Tracy, Karen (https://experts.colorado.edu/display/fisid_101190)
Professor; PhD, University of Wisconsin-Madison

White, Cindy Hagemeyer (https://experts.colorado.edu/display/fisid_107461)
Associate Professor; PhD, University of Arizona

COMM 1210 (3) Perspectives on Human Communication

Surveys communication in a variety of contexts and applications. Topics include basic concepts and general models of communication, ethics, language and nonverbal communication, personal relationships, group decision making, organizational communication, and impact of technological developments on communication. Required for COMM majors.

Additional Information: Arts Sci Core Curr: Contemporary Societies
MAPS Course: Social Science

COMM 1300 (3) Public Speaking

Covers theory and skills of speaking in various public settings. Examines fundamental principles from rhetorical and communication theory and applies them to oral presentations. Required for COMM or COMN majors.

COMM 1600 (3) Group Interaction

Covers basic theories, concepts, and characteristics that underlie face-to-face interactions in interpersonal, small group, and organizational settings. Activities stress the development of both task and relational skills in these settings. Required for COMM or COMN majors.

COMM 2000 (3) Topics in Communication

Investigates select topics in communication. Does not count toward the 2000-level courses required for the major, unless explicitly stated in the course schedule.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 2360 (3) Campaigns and Revolutions

Introduces concepts in rhetoric and argumentation that are used to explain significant social and political changes in our society. The goal is to show how social actors use rhetoric to promote some social goals and hinder others.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 2400 (3) Discourse, Culture and Identities

Examines how aspects of talk (e.g., turn-taking, speech acts, narratives, dialect, and stance indicators) link with identities (e.g., ethnic and racial, age, gender, work-related, and personal). Considers how communication is central to constructing who people are and examines social controversies related to talk and identities.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

COMM 2500 (3) Interpersonal Communication

Focuses on basic processes in face-to-face interaction, including verbal and nonverbal messages, coordination in conversation, messages about self and others, and communication in personal relationships. Emphasizes theory and concepts rather than skills.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 2600 (3) Organizational Communication

Provides a communicatively based definition of formal organization and deals with individual-organizational relationships. Addresses topics such as organizational theory, organizational culture, power, technology, decision making, teamwork, leadership, diversity, gender, socialization, and ethics.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3000 (3) Issues in Communication

Explores select issues in communication.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3210 (3) Human Communication Theory

Acquaints students with general, thematic, and contextual theories of human communication. Gives attention to criteria for evaluating theories.

Requisites: Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

COMM 3300 (3) Rhetorical Foundations of Communication

Provides the rhetorical foundations of communication through study of the humanistic traditions of rhetorical theory, with applications to social interaction and message analysis.

Requisites: Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

COMM 3310 (3) Principles and Practices of Argumentation

Focuses on principles of argument, the process of critical decision making, and uses and limitations of logic and evidence. Contemporary issues (personal, social, political, or philosophical) are analyzed and debated.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3320 (3) Persuasion in Society

Explores how persuasion influences decision making. Focuses on different definitions and models of persuasion, ethical perspectives on persuasion, qualitative and quantitative research on persuasion, and the tools of motivation, as well as how to create effective and ethical persuasive messages.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3340 (3) Political Communication

Provides an overview of the role of communication in contemporary political life. Topics include political communication theories, political campaign communication, media and political communication, and the role of political communication in promoting democracy and public policy.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3370 (3) Environmental Communication

Introduces the growing field of environmental communication, including historical events, key concepts, legal landmarks, technological developments and public controversies at the intersection of the environment, economics and social justice. Focuses on persuasive communication in the public sphere, as well as the constitutive power of communication to name and redefine what has been and might become possible in our environmental imaginations.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

COMM 3410 (3) Intercultural Communication

Explores complex relationships between culture and communication processes from various conceptual perspectives, such as social, psychological, interpretive, and critical. Considers the important role of context (e.g., social, historical, and cultural) in intercultural interactions.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

Additional Information: Arts Sci Core Curr: Human Diversity

COMM 3420 (3) Gender and Communication

Examines gender as a social practice that remains vital to identities, relationships, and institutions in contemporary society. Treats gender as something we do or enact through communication, rather than as something we are or have, and explores the implications of this shift in perspective. Investigates how gender interacts with sexuality, race, class, nation, age, ability, and other aspects of identity.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

COMM 3510 (3) Family Communication

Explores communication in families from various theoretical perspectives, such as social constructionism, systems theory, and dialectical theory. Communication patterns and processes created and sustained by family members are examined, including rules, roles, stories, rituals, myths, metaphors, themes, and cycles.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3610 (3) Communication, Technology, and Society

Presents theory, research, and exploration into computer-based technologies; studies implications for communication, interaction, and social relationships.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3700 (3) Communication and Conflict Management

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

Equivalent - Duplicate Degree Credit Not Granted: PACS 3700

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

COMM 3740 (3) Qualitative Communication Research Methods

Provides an understanding of methods associated with the study of communication in natural settings. Focuses on strategies of collecting, analyzing, and reporting qualitative data, including participant observation, in-depth interviewing, textual analysis, and ethnographic narrative.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3750 (3) Quantitative Research Methods

Introduces empirically oriented research methods in communication, critical review of the logic of social-scientific principles in communication, and analysis of quantitative data.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3760 (3) Rhetorical Criticism

Applies key concepts from rhetorical theory to the analysis of specific speeches, written texts, and social situations within the humanistic tradition. Students read a variety of types of criticism and are encouraged to develop their own strategies for critical analysis.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

Recommended: Prerequisites COMM 1210 and COMM 1600 and COMM 3300.

COMM 4000 (1-6) Advanced Topics in Communication

Analyzes special interest areas of communication theory, research, and practice. Course format involves lecture, discussion, investigative analysis, and practical application. May be repeated twice for credit on different topics.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 3210 and COMM 3300.

COMM 4100 (3) Seminar in Honors Thesis Writing and Research

Provides the opportunity for students writing an honors thesis to develop their understanding of the research process and to improve their research and writing skills.

Requisites: Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

Additional Information: Arts Sciences Honors Course

COMM 4220 (3) Senior Seminar: Functions of Communication

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

Equivalent - Duplicate Degree Credit Not Granted: COMM 5220

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4300 (3) Senior Seminar: Rhetoric

Reviews current theory and research on topics such as rhetoric and publics, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

Equivalent - Duplicate Degree Credit Not Granted: COMM 5300

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3300 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4510 (3) Senior Seminar: Interpersonal Communication

Reviews current theory and research on topics such as strategic interaction, relationship formation and maintenance, and identity and self-presentation. May be taken twice for credit on different topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4600 (3) Senior Seminar: Organizational Communication

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

Equivalent - Duplicate Degree Credit Not Granted: COMM 5600

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4610 (3) Communication Studies of Science and Technology

Reviews current theory and research associated with science, technology, and medicine. Topics include new communication technologies in organizations and society, discourses of scientific theory and science policy, and interaction in clinical setting. May be taken twice for credit on different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4840 (1-6) Undergraduate Independent Study

Note that the 14-hour limit in the major applies to any combination of independent study and internship credit. This course does not count toward the 33 credit hours required for the major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only.

Recommended: Prerequisites COMM 3210 and COMM 3300.

COMM 4930 (1-6) Internship

Studies are pursued in communication-related work experience projects that generally require 40 hours on the job per credit hour and evidence (e.g., journal, paper and employer evaluation) of significant learning. The 14-hour limit in the major applies to any combination of independent study and internship credit and does not count toward the 33 hours required for the major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only.

Recommended: Prerequisite 57 hours of overall course work, 18 hours of communication course work completed, 2.50 overall GPA and a faculty sponsor.

Grading Basis: Pass/Fail

COMM 4950 (1-6) Senior Thesis: Honors

For exceptional communication majors who wish to graduate with department honors and receive credit for writing an honors thesis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite COMM 4100 and overall GPA of 3.35 or higher and a COMM or COMN GPA of 3.50 or higher.

Additional Information: Arts Sciences Honors Course

Communication - Bachelor of Arts (BA)

The BA in communication provides a broad-based liberal arts degree designed to foster students' abilities to understand, analyze, and effectively engage in a wide range of communication practices. It fosters critical thinking about the ways that symbols and interactions contribute

to social problems and solutions to them, to identities and differences, to organizations and work, to personal relationships and groups and to experience and meaning across cultural settings.

At the same time, the major provides instruction and practice in the skills of effective communication and collaborative problem-solving that employers are looking for—speaking, writing, reading, listening, asking good questions, utilizing media and working in groups. The mix of theory and practice gives students the tools to improve communication performance and critical awareness of it across many situations.

Requirements

Majors must complete a minimum of 36 credit hours of course work in communication, at least 18 of which must be upper division (3000 level or higher). Only courses with grades of C- or better count toward the major, and the overall major GPA must be 2.000 (a C- is 1.700).

Required Courses and Semester Credit Hours

Required Courses

COMM 1210	Perspectives on Human Communication	3
COMM 1300	Public Speaking	3
COMM 1600	Group Interaction	3
COMM 3210	Human Communication Theory	3
COMM 3300	Rhetorical Foundations of Communication	3
Select at least two of the following:		6
COMM 2360	Campaigns and Revolutions	
COMM 2400	Discourse, Culture and Identities	
COMM 2500	Interpersonal Communication	
COMM 2600	Organizational Communication	
Select one of the following methods courses:		3
COMM 3740	Qualitative Communication Research Methods	
COMM 3750	Quantitative Research Methods	
COMM 3760	Rhetorical Criticism	
Select one of the following senior seminars:		
COMM 4220	Senior Seminar: Functions of Communication	
COMM 4300	Senior Seminar: Rhetoric	
COMM 4400		
COMM 4510	Senior Seminar: Interpersonal Communication	
COMM 4600	Senior Seminar: Organizational Communication	
COMM 4610	Communication Studies of Science and Technology	

At least two additional upper-division electives (3000- or 4000-level courses): 4000-level courses may be taken twice (only twice) with different topics 6-9

Total Credit Hours 30-33

Up to 8 credit hours of independent study and 6 credit hours of internships may be taken. These are upper-division elective hours but do not count toward major requirements. Eligible students interested in graduating with department honors should contact the department's honors coordinator as soon as possible.

Secondary Area of Study

In addition to coursework required for the major, all students in COMM must complete a secondary area of study outside of COMM. This secondary area of study can be met by any of the following: a minor,

a second major within CMCI, a double degree, or any credit-based certificate program of at least 12 credit hours.

The department encourages its majors to take related courses in other departments in CMCI as well anthropology; business; English; ethnic studies; history; linguistics; philosophy; political science; sociology; speech, language and hearing sciences; and theatre and dance.

The department also encourages participation in optional programs such as study abroad, internships and graduating with honors.

Students who wish to major in communication should meet with a department advisor, where they will be advised of any changes in this list of requirements.

Communication - Minor

Communication is essential in our lives. Employers consistently rank communication skills among the most important qualities they look for in potential employees. Relationships of all sorts are built upon communication. Change at the personal, local and societal levels is advanced through advocacy and other forms of purposeful communication.

A minor in communication allows you to explore how communication shapes everything we do in society. Your classes will introduce you to theories that allow you to understand how communication creates the worlds we live in. They will provide you the tools to analyze and potentially change real-world processes and problems. They will offer you the chance to develop practical skills to apply in your professional, personal and civic life. In the process, you will get a broad exposure to the study of communication as it occurs in interpersonal, group, organizational and public settings.

To declare the communications minor, visit COMM advisors Bevin Gumm (Armory 1B12) or Debbie J. O'Neill (Armory 1B15) during advising walk-in hours on Mondays from 1 to 3 p.m.

Requirements

Students pursuing the minor must complete a minimum of 18 credit hours of course work in communication, at least 9 of which must be upper division (3000 level or higher). Only courses with grades of C- or better count toward the major, and the overall major GPA must be 2.000 (a C- is 1.700). They may apply no more than 6 credit hours of transfer work, including 3 credit hours of upper-division credit.

Required Courses and Semester Credit Hours

COMM 1210	Perspectives on Human Communication	3
COMM 1300	Public Speaking	3
	or COMM 1600 Group Interaction	
One 2000-level course		3
Three upper-division courses (3000 level or higher)		9
Total Credit Hours		18

Students who wish to minor in communication should meet with a department advisor, where they will be advised of any changes in this list of requirements.

Critical Media Practices

Critical media practices addresses the changing landscape of electronic media making by developing student analytical and production skills

across a wide range of platforms, practices and technologies. The department explores the creative potential of cross-platform media production, as well as time-based media arts practices, such as immersive media production, sound practices and performance media. Our convergent approach to media spans a variety of media tools including digital photography, audio/video editing and single camera video production, computational media, open source programming and emergent tools under development. Our students acquire the skills and perspective to critically understand and actively contribute to this new constellation of audio-visual media making possibilities. The Department of Critical Media practices aims to prepare students to pursue careers as media art creators and critical citizens for the 21st century.

Production coursework encourages the development of personal style as students explore the expressive potential of emergent media practices, with a particular emphasis on the documentary impulse and making the “invisible” visible. Our program explores media art from a critical perspective: its nature, its history and its place in the contemporary world. Students are required to analyze not only existing media but also their own work. In this way the program presents media art as a way of engaging and knowing the world. At the graduate level, our department features an MFA degree in Interdisciplinary Documentary Media Practices and a Graduate Certificate in Interdisciplinary Documentary Media Practices. The department also offers a practice-led Ph.D. in Emergent Technologies and Media Art Practices. The Center for Documentary and Ethnographic Media is affiliated with our program. Our department collaborators include faculty and students from Anthropology, Art and Art History, Center for the American West, Center for Asian Studies, Dance, English, Film Studies, Geography, Music and programs within the College of Media Communication and Information.

Course code for this program is CMDP.

Bachelor's Degree

- Media Production - Bachelor of Arts (BA) (p. 785)

Minor

- Media Production - Minor (p. 786)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ambrose, Kirk T (https://experts.colorado.edu/display/fisid_115914)
Professor; PhD, University of Michigan Ann Arbor

Auguiste, Reece Luke (https://experts.colorado.edu/display/fisid_149596)
Assistant Professor; PhD, Univ of Nottingham (England)

Boord, Daniel Olin (https://experts.colorado.edu/display/fisid_134649)
Professor; MFA, University of California-San Diego

Espelie, Erin Marie (https://experts.colorado.edu/display/fisid_148671)
Assistant Professor; MFA, Duke University

Ewen, Hunter P (https://experts.colorado.edu/display/fisid_152587)
Instructor; DMA, University of Colorado Boulder

Hammons, Christian Stanford (https://experts.colorado.edu/display/fisid_152915)
Instructor; PhD, University of Southern California

Mason, Gesel R (https://experts.colorado.edu/display/fisid_149966)
Assistant Professor; MFA, University of Colorado Boulder

Oakes, Timothy S. (https://experts.colorado.edu/display/fisid_109269)
Professor; PhD, University of Washington

Rivers, Julius Edwin (https://experts.colorado.edu/display/fisid_101652)
Professor; PhD, University of Oregon

Saxton, Richard W (https://experts.colorado.edu/display/fisid_144756)
Associate Professor; MFA, Indiana University Bloomington

CMDP 1400 (4) Introduction to Contemporary Media Cultures

Prepares students for critical practices in contemporary media cultures in a global context. Explores the diversity of media practices, including narrative and non-narrative forms, emphasizing aesthetics and visual studies. In lectures and labs students will explore video, sound, the internet and other multi-media platforms of expression.

CMDP 2010 (3) Information, Media and Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission and retrieval. Equips students with an understanding of technological transformations in interpersonal, organizational and mass communication. Emphasis is on the technological, social and political changes that underlie the movement toward a digital society.

Grading Basis: Letter Grade

CMDP 2100 (3) Approaches to Historical Media Practices

Investigate historical and cultural discourses in the formation of media practices. Examines practices such as performance media; cinematic media, media art, and their aesthetic alignment to cognate movements throughout history.

CMDP 2400 (3) Media Aesthetics

Builds students' ability to watch, reflect on, and write about media images. The course will be grounded in the analysis of media practices with special focus on media style and storytelling techniques. Explores media aesthetics from formal, cultural, and theoretical perspectives.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 2500 (3) Introduction to Media Practices

Working in design groups, students will explore the expressive potential of media through the production of short projects, discussions, readings, formal analysis, and critique. Provide a basic introduction to media practices as an extension of "visual thinking" and through approaches to storytelling, and hybrid media forms.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 2510 (1-3) Critical Media Practices Workshop 1

Training in narrow topics of media practices.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Media, Communication and Information (CMCI) or Arts and Sciences (ARSC) majors only.

CMDP 2600 (3) Creative Media Making

Focus on developing an understanding of the principles, forms and aesthetics of media production. Working in design groups on small-scale media preproduction and production exercises, screenings and critiques, students learn creative solutions to problems in realizing expressive media projects.

Requisites: Requires prerequisite courses of CMDP 1400 and CMDP 2500 (all minimum grade B-).

Grading Basis: Letter Grade

CMDP 2710 (3) Media Production Methods and Ideas

Explores creative approaches to idea formation, conceptualization, and organization for the moving image employing critical thinking, improvisation and visual storytelling techniques. Includes forms of creative writing, storytelling and preproduction techniques and strategies.

Requisites: Restricted to College of Media, Communication and Information (CMCI) or Arts and Sciences (ARSC) majors only.

CMDP 2720 (3) Animation

Explore computer animation in the making of short projects that may address topics such as: nonfiction, immersive environments and digital compositing. Designed to develop the student's understanding of movement, timing, scripting, editing and color composition. Through screenings and discussions students will gain an appreciation of history and practices of animation.

Requisites: Requires a prerequisite course of CMDP 2500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 2810 (3) Documentary Media Poetics

Investigates documentary cinema and media practices through class discussions, research papers, hands on exercises and the screenings. Cross-references documentary photography and moving-image documentary in the production of short digital projects. Explores the distinctive contributions of digital technologies to documentary image making.

Requisites: Requires prerequisite course of CMDP 2500 (minimum grade C-).

CMDP 2820 (3) Exploring Culture and Gender Through Film

Explores the concepts of culture and gender from an anthropological perspective through media. By experiencing texts, images and sounds about other ways of life, students will learn the basic concepts of cultural anthropology and learn to think critically about documentary and ethnographic media material.

Grading Basis: Letter Grade

CMDP 2860 (2) Performance Audio Recording

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering, addressing contemporary issues in technology, web, and performance media. Uses recorded material from in-class sessions. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2081

Requisites: Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 2870 (2) Recording Design

Provides hands-on instruction in various sound recording techniques. Addresses acoustics, sound reinforcement, studio maintenance and troubleshooting. Taught through labs and individual recording projects. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2091

Requisites: Requires prerequisite course of CMDP 2860 or MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 3110 (3) Electronic Arts Survey

Explores the development of electronic media art through screenings, readings, lectures and discussions.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3210 (3) Interactive Digital Cultures

Examines how the uses of interactive media have changed the classical dynamics of human communication, allowing multidirectional, non-linear and multimedia practices. In this course, students will study the various aesthetic, narrative, emotional and cultural elements of the interface in areas such as non-linear video, the web, games and hypermedia.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3310 (3) Performance Media Cultures

Reflect on the cultural construction of old and new performance media through the lens of emerging practices and contemporary discourse. From ancient theatre to cinema, interactive television to YouTube, and multi-media dance performances to computer games, this course explores how media shape, and are shaped by, various historical and contemporary audiences and contexts.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3350 (3) Modes of Documentary Media History

Introduces students to the variety of practices by examining their emergence, evolution and cultural impact in the global sphere. Students discover the major themes and genres in documentary work from photography, cinema, audio, hypermedia and the public debates they have engendered. Through lectures, screenings and research, develop critical perspectives on the international and transcultural dimensions of documentary media history.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 3450 (3) Critical Perspectives in Media Practices

Examines the contemporary landscape of media practices across platforms, such as film, social media, painting, video, and web art. This integrative exploration focuses on production contexts, circulation and reception through the lens of critical and interpretive frameworks. Drawing from key texts by major scholars and the works of media practitioners, students develop globally informed, critical perspectives for understanding.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 3500 (3) Digital Photographic Practices

Explores the creative possibilities of photography; students work on projects that combine concepts and techniques with contemporary practice and current modalities of exhibition and social distribution. Emphasis is placed on the student's personal growth through aesthetic and intellectual development in relation to current technologies.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3510 (1-3) Critical Media Practices Workshop II

Training in narrow topics of media practices. Open to CMCI students and by permission of the instructor.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3610 (3) Contemporary Image Making Practices

Provides students the technical skills for in depth exploration of the evolving principles and strategies of digital image making. Students will create small-scale projects with the primary emphasis on cinematographic experimentation and innovative visual techniques.

Requisites: Requires prerequisite course of CMDP 3500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3620 (3) Images and Stories

Learn and apply innovative non-traditional approaches to scripting and storytelling, including automatic thinking, idea sketches, visual notes, outlines and storyboards, serials, aleatoric methods, diagrams, locations, photographs and short stories. Focuses on methods of exploring scripting methods outside of the fixed and rule-bound traditional model of storytelling as a means of introducing students to discover their own scripting techniques.

Requisites: Requires a prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3710 (3) Digital Design

Introduces techniques, software and related concepts of digital design and image making through individual and group projects. Emphasizes digital animation, digital audio, digital video and website design and development as a means to formal and expressive ends. Introduces students to critical readings and theories related to digital media practice.

Requisites: Requires prerequisite course of CMDP 2010 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3720 (3) Multimedia Composition

Combine writing with media such as video, music, animation and podcasting on the computer. Includes a unit on web-site design and ends with each student creating their own website and positing on it the project they created for the course.

CMDP 3810 (3) Engaged Documentary Media Practices

Combining research, scripting methods and field trips, students produce short media non-fiction storytelling projects emerging from an engagement with historical events, contemporary issues and the world around us.

Requisites: Requires prerequisite courses of CMDP 2600 and CMDP 2810 (all minimum grade C-).

Grading Basis: Letter Grade

CMDP 3820 (3) Performance Media Practices

Develop a performance vocabulary within the context of various media platforms. Through creating individual and collaborative performance projects, students will explore performance design issues such as movement, blocking and staging with projection, sensors, sound and other media tools.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3830 (3) Advanced Performance Media Workshop

Study practical, technical and theoretical strategies of performing with and through media. This is an in-depth course that investigates a narrow scope drawn from topics that may include dance/movement, the illustrated lecture, projection environments, digital sensing, responsive lighting or acoustic strategies for performance.

Requisites: Requires prerequisite course of CMDP 3820 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3840 (3) Sound Practices

Explores the aesthetics of sound through the study of sound art and sound culture. Reading and discussion covers theories, technologies, and histories that drive the medium. Students apply concepts by designing and building their own soundscapes. Classes will be organized around hands-on activities, lecture, and discussion of readings. Instructor consent required.

Requisites: Requires prerequisite course of CMDP 2500 or CMDP 2860 or MUSC 2081 (minimum grade C-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 3860 (3) Introduction to Music Technology

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4081 and MUEL 4081

Requisites: Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 3910 (3) Media Production Topics

Rotating topics in media production techniques.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of CMDP 2500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3990 (3) Media Professional Seminar

Learn aspects of professional development in media production. Through workshops, class trips and assignments students will learn of the many opportunities found within media production.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4110 (3) Cultures of Digital Sound

Introduces students to a variety of critical scholarship and debates about our sonic environment through an examination of how sound interfaces with different facets of media production. Consisting of listening, analyzing and differentiating sound in different contexts, students will deepen their understanding of the relationship between sight and sound in cultural production.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4220 (3) Digital Archives in Media Practices

Examine the theories and methods underpinning the use of archival materials in non-fiction media production while simultaneously exploring questions of ethics, truth and representation that the use and manipulation of archives raises. Through weekly lectures, seminars, readings and screenings, students will discover the theories and interpretive approaches to understanding the archive and its uses.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4310 (3) Screen Culture and Globalization

Examine the formation of screen cultures (narrative, experimental, documentaries and multi-media video art) in the context of the cultural globalization of the moving image. Through lectures, seminars and research projects students explore the formation and evolution of screen cultures on various platforms such as digital cinema, web environments, video art, multi-channel installations and the moving image on mobile interfaces.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4320 (3) Media Engagement in Digital Diasporas

Offers students critical and interpretive frameworks for understanding the cultural and historical significance of digital diasporas and these communities' use of digital technologies for communication, community building and the creation of digital documents about migration and connectivity with the homeland.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4410 (3) Topics in Contemporary Media Technologies

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminar, students explore the work of contemporary thinkers and practitioners in the field.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4450 (3) Topics in Contemporary Media Technologies

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminars, students explore the work of contemporary thinkers and practitioners in the field.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4610 (3) Small Screen Storytelling

Shoot footage on or for mobile screens including narratives, microdocumentaries, music videos, short stories and collaborative exquisite corpse projects. Students will complete work and distribute through various outlets on the internet.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4620 (3) Media Environments

Explore the design and implementation of multimedia environments. Students will develop strategies for creating media exhibitions and/or performance environments with projection and sounds activated by sensors. This course is ideal for performers, dancers and media artists as well as those desiring to present information in novel ways, such as working with archival or non-fiction materials.

Requisites: Requires prerequisite course of CMDP 3830 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4630 (3) Introduction to Computational Media

Develop the technical and conceptual skills for computational media practices. Through individual and collaborative projects, students will explore the creative use of electronics and microcontrollers (including wearable and other embedded systems) through relevant programming environments. Introduces visual programming with a focus on signal processing for image and sound.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4640 (3) Multimedia Sound

Learn what sound is and where it comes from; how to create, analyze, alter, mix, and record it digitally in the studio and in the field; and how it can interact creatively with other media. In addition to analyzing how professionals use sound, students will create five sound-based projects of their own.

CMDP 4710 (3) Projection Practices

Design and implement projection-based media projects and explore projection practice as a distinct field. Through individual and collaborative projects, this course explores projection for live events, installation, moving images and site-specific or community-based projects. Students will be introduced to emergent software and hardware for projection design.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4720 (3) Installation and Performance Media

Focusing on live image and sound processing in constructed or natural environments, students will work individually or collaboratively on an installation project that engages with the intersection of performance and media. Potential models include site specific work, illustrated lecture, gallery installation, movement and dance with projection mapping, participatory media and virtual environments.

Requisites: Requires prerequisite course of CMDP 4620 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4730 (3) Digital Art and Emergent Technologies

Explores digital artistic practices across contexts and disciplines in various contexts. Emphasizes web and networked media as it applies to digital practices in sound, image, language, spatial and time-based arts.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4810 (3) Advanced Documentary Practices

Combine research and production to produce short documentary media projects, which explore the world we live in. Focusing on practice, this course explores stylistic options employed on documentaries that give voice to different perspectives on the world. Students will be able to identify the tactics and strategies of documentaries in a variety of media, and will include visits with professional documentary makers. Students will complete a final documentary project.

Requisites: Requires prerequisite course of CMDP 3810 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4820 (3) Ethnographic Media

Explores emerging creative documentary practices through visual research, fieldwork, oral histories and the construction of innovative ethnographies. Through ethno-fiction, eco-ethnography, photography, indigenous media and cinema, students explore the development of ethnographic documentary and visual anthropology in both traditional and experimental forms. Projects are developed with an emphasis on the ethical and political challenges of representation through media technologies.

Requisites: Requires prerequisite course of CMDP 4810 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

CMDP 4860 (2) Computer Composition

Learn strategies and techniques for generating and manipulating sound with computer-specific tools. Students' projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia and performance projects.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4111

Requisites: Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade D-).

Grading Basis: Letter Grade

CMDP 4870 (3) Sound and Technology Topics

Exploration of issues, techniques and tools of music and sound technology. Topics vary and may include: interactive systems for performance; music and mobile media; electronic music instrument design; digital synthesis and signal processing; music in multimedia; sound practices and analysis. Lecture during work sessions will support student projects.

Requisites: Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4900 (3) Concepts and Practices of Contemporary Media

Explores the application of new media technologies in depth, and engages students in an ongoing dialogue about the cultural context of new media technologies and their own work. Students will produce a major media project that synthesizes methods of media making into modes of communication and expression. This is the capstone course for undergraduates in Media Production.

Requisites: Requires prerequisite course of CMDP 3500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Media Production - Bachelor of Arts (BA)

For the Bachelor of Arts in media production, students will first complete the foundational courses in theory and practice before proceeding to advanced courses in media production and critical studies.

Students from within or outside the College of Media, Communication and Information (CMCI) can pursue course work within the Department of Critical Media Practices (DCMP), provided they meet course prerequisites, though seating priority is given to declared majors. With advisor and faculty guidance, DCMP majors may elect to design a 12-credit-hour concentration derived from areas within CMCI.

Program Tracks

Once the basic requirements are completed, students in this major may elect to focus on one of four areas of concentration:

- digital cultures concentration
- documentary concentration
- sound practices concentration
- performance media concentration

Students may also elect to follow a comprehensive approach to media production provided by a 9-credit-hour elective structure.

Requirements

Students will take the foundational courses in theory and practice, CMDP 1400 and CMDP 2500, before proceeding to advanced courses in media production. Critical studies courses require that students take CMDP 1400.

In addition to the basic requirements, students in this major may elect to focus on a specific area of concentration. Students may also elect to follow a comprehensive approach to media production provided by a 9-credit-hour elective structure. Students from within or outside the

college may pursue course work within CMDP, provided they meet course prerequisites, though seating priority is given to declared majors. With advisor and faculty guidance, CMDP majors may elect to design a 12-credit-hour concentration derived from areas within the college.

All students will be required to take the capstone course Concepts and Practices of Contemporary Media (CMDP 4900, 3) in their final year.

Required Courses and Semester Credit Hours

Required Studio Courses

CMDP 2500	Introduction to Media Practices	3
CMDP 2600	Creative Media Making	3
CMDP 3500	Digital Photographic Practices	3
CMDP 4900	Concepts and Practices of Contemporary Media	3

Studio Electives Courses (Rotating Electives)

Select 9 credit hours from the following or a CMDP concentration: 9

CMDP 2510	Critical Media Practices Workshop 1	
CMDP 2710	Media Production Methods and Ideas	
CMDP 2720	Animation	
CMDP 2810	Documentary Media Poetics	
CMDP 2860/ MUSC 2081	Performance Audio Recording	
CMDP 2870/ MUSC 2091	Recording Design	
CMDP 3510	Critical Media Practices Workshop II	
CMDP 3610	Contemporary Image Making Practices	
CMDP 3620	Images and Stories	
CMDP 3720/ ENGL 3856/ ATLS 3519	Multimedia Composition	
CMDP 3810	Engaged Documentary Media Practices	
CMDP 3820	Performance Media Practices	
CMDP 3830	Advanced Performance Media Workshop	
CMDP 3840	Sound Practices	
CMDP 3860/ MUSC 4081/ MUEL 4081	Introduction to Music Technology	
CMDP 3910	Media Production Topics	
CMDP 3990	Media Professional Seminar	
CMDP 4610	Small Screen Storytelling	
CMDP 4620	Media Environments	
CMDP 4630	Introduction to Computational Media	
CMDP 4640/ ENGL 4116/ ATLS 4519	Multimedia Sound	
CMDP 4810	Advanced Documentary Practices	
CMDP 4820	Ethnographic Media	
CMDP 4841	Undergraduate Independent Study	
CMDP 4860/ MUSC 4111	Computer Composition	
CMDP 4870/ MUSC 4121/ MUEL 4121	Sound and Technology Topics	
CMDP 4905		
CMDP 4920		

CMDP 4931	Internship	
Required Media Production Critical Studies Courses		
CMDP 1400	Introduction to Contemporary Media Cultures	4
CMDP 2100	Approaches to Historical Media Practices	3
CMDP 2400	Media Aesthetics	3
Media Production Critical Studies Electives		
Select 9 credit hours from the following or a CMDP concentration:		9-18
CMDP 3210	Interactive Digital Cultures	
CMDP 3350	Modes of Documentary Media History	
CMDP 3410		
CMDP 3450	Critical Perspectives in Media Practices	
CMDP 4110	Cultures of Digital Sound	
CMDP 4220	Digital Archives in Media Practices	
CMDP 4310	Screen Culture and Globalization	
CMDP 4320	Media Engagement in Digital Diasporas	
CMDP 4410	Topics in Contemporary Media Technologies	
CMDP 4450	Topics in Contemporary Media Technologies	
Total Credit Hours		40-49

Program Tracks

Digital Cultures Track

Students follow the basic major requirements, but instead of taking electives they complete the 12-credit-hour certificate offered through the ATLAS technology, art and media program. This provides students with an opportunity for an in-depth exploration of contemporary digital media cultures.

Documentary Track

Students follow the basic major requirements, but instead of taking electives they complete 12 credit hours of prescribed course work within CMDP focusing on documentary storytelling.

Sound Practices Track

Students follow the basic major requirements, but instead of taking electives they complete 18 credit hours of prescribed course work within CMDP focusing on Music Technology.

Performance Media Track

Students follow the basic major requirements, but instead of taking electives they complete courses that develop a performance vocabulary and explore the historical and cultural contexts of performance through project-based courses exploring the design and implementation of media installations. The capstone project will be a large-scale performance or installation.

Secondary Area of Study

In addition to course work required for the major, all students in MDPD must complete a secondary area of study outside of MDPD. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree, or any credit-based certificate program of at least 12 credit hours.

Media Production - Minor

Students majoring in any discipline may pursue a minor in media production.

Requirements

The minor consists of a total of 19 credit hours, with three required media production courses that combine theory with technical skill in order to prepare students for upper division study.

Students must complete all classes for the minor with a grade of C- or better and an overall GPA in the minor of 2.0.

Students may apply no more than six credit hours of transfer work, including three hours of upper-division credit.

Required Courses and Semester Credit Hours

Required Lower-Division Foundation Courses

CMDP 1400	Introduction to Contemporary Media Cultures	4
CMDP 2500	Introduction to Media Practices	3
CMDP 2600	Creative Media Making	3

Electives

Choose three upper-division media production courses:		9
CMDP 3510	Critical Media Practices Workshop II	
CMDP 3620	Images and Stories	
CMDP 3720	Multimedia Composition	
CMDP 3820	Performance Media Practices	
CMDP 3810	Engaged Documentary Media Practices	
CMDP 3840	Sound Practices	
CMDP 3860	Introduction to Music Technology	
CMDP 3910	Media Production Topics	
CMDP 3990	Media Professional Seminar	
CMDP 4610	Small Screen Storytelling	
CMDP 4620	Media Environments	
CMDP 4630	Introduction to Computational Media	
CMDP 4640	Multimedia Sound	
CMDP 4710	Projection Practices	
CMDP 4730	Digital Art and Emergent Technologies	

Total Credit Hours 19

Information Science

Information science considers the relationships between people, places and technology—as well as the information or data those interactions yield. It unites a number of interdisciplinary approaches for understanding and shaping human-data interaction. Drawing on knowledge from social science, computing, data science and the humanities, information scientists support the study and innovation of “socio-technical systems.”

Students will acquire broad skills in information science, including:

- multiple forms of information analysis, from small data to big data, from quantitative to qualitative, from data exploration to information exposition;
- skills in communicating information to different audiences;
- understanding social and ethical contexts of information and technology;
- human-centered design of data and artifacts;
- data curation;

- computing to support information-analytic skills and prototype building.

Course code for this program is INFO.

Bachelor's Degree

- Information Science - Bachelor of Science (BS) (p. 791)

Minor

- Information Science - Minor (p. 792)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Kenneth M (https://experts.colorado.edu/display/fisid_113566)
Professor; PhD, University of California-Irvine

Barker, Lecia Jane (https://experts.colorado.edu/display/fisid_101367)
PhD, University of Colorado Boulder

Brubaker, Jed Richards (https://experts.colorado.edu/display/fisid_156193)
Assistant Professor; PhD, University of California-Irvine

Fiesler, Casey Lynn (https://experts.colorado.edu/display/fisid_155950)
Assistant Professor; PhD, Georgia Institute of Technology

Kane, Shaun Kevin (https://experts.colorado.edu/display/fisid_154603)
Assistant Professor; PhD, University of Washington

Keegan, Brian (https://experts.colorado.edu/display/fisid_158122)
Assistant Professor; PhD, Northwestern University

Larsen, Kai Rune (https://experts.colorado.edu/display/fisid_118160)
Associate Professor; PhD, SUNY at Albany

Lewis, Clayton H (https://experts.colorado.edu/display/fisid_100307)
Professor; PhD, University of Michigan Ann Arbor

Palen, Leysia A (https://experts.colorado.edu/display/fisid_114604)
Professor; PhD, University of California-Irvine

Paul, Michael J (https://experts.colorado.edu/display/fisid_156070)
Assistant Professor; PhD, Johns Hopkins University

Robinson, Rick Emery (https://experts.colorado.edu/display/fisid_156556)
Senior Instructor; PhD, University of Chicago

Szafir, Danielle N (https://experts.colorado.edu/display/fisid_156317)
Assistant Professor; PhD, University of Wisconsin-Madison

Voida, Amy Kathryn Mitchell (https://experts.colorado.edu/display/fisid_155855)
Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A (https://experts.colorado.edu/display/fisid_155856)
Assistant Professor; PhD, Georgia Institute of Technology

INFO 1101 (3) Computation in Society

Introduces students to modern information and communication technology, the basic principles of software and programming, the fundamental role of algorithms in modern society, computational reasoning, the major organizations in the information sector and fundamental interactions between humans and information technology. Appropriate for students with limited prior experience with computing. Fulfills the CMCI computing requirement.

Grading Basis: Letter Grade

INFO 1111 (4) Representations Seminar and Studio

Expands students' perspectives on fundamental categories of human experience and helps them develop critical perspectives on how that experience is constructed. Focuses on the ways in which experiences and world views reflect cultural and social differences. Studio format enables students to directly understand how systems of convention live in the simplest of representations.

Grading Basis: Letter Grade

INFO 1112 (4) Representations Seminar and Studio

Expands students' perspectives on fundamental categories of human experience and helps them develop critical perspectives on how that experience is constructed. Focuses on the ways in which experiences and worldviews reflect cultural and social differences. Studio format enables students to directly understand how systems of convention live in the simplest of representations.

Requisites: Requires enrollment in corequisite course of INFO 1111.

Grading Basis: Letter Grade

INFO 1121 (4) Interactions Seminar and Studio

Provides an introduction to thinking about human-centered design and the universal requirements of interactions with data, information and technologies. Studio experiences challenge students to consider the impact that design choices in information and computing technologies have on a) enabling diverse audiences to access, manipulate and experience information, and b) how differences get encoded by data structures, ultimately reflecting biases.

Requisites: Requires enrollment in corequisite course of INFO 1122.

Grading Basis: Letter Grade

INFO 1122 (3) Interactions Seminar

Surveys key concepts and theories in Information Science, focusing on the ways information enables new ways of living, working and thinking. Students will critically examine texts, systems and interpretations of data from a variety of disciplinary perspectives that speak to how people, infrastructures and contexts constrain and enable uses of information.

Requisites: Requires enrollment in corequisite course of INFO 1121.

Grading Basis: Letter Grade

INFO 1201 (3) Computational Reasoning 1: Expression and Media Transformation

Introduces principles of computational thinking through the manipulation, transformation and creation of media artifacts, such as images, sound and web pages. Students will be exposed to a high-level overview of algorithms, functions, data structures, recursion and object-oriented computer programming through a series of assignments that emphasize the use of computation as a means of creative expression.

Grading Basis: Letter Grade

INFO 1301 (3) Quantitative Reasoning 1: Intuitions and Evidence

Surveys concepts and techniques for characterizing and quantifying data. Students will learn to use different types of quantitative data, to summarize data with descriptive statistics, to measure similarity of different datasets, to interpret probabilities and statistical significance and to quantify and predict changes in data.

Grading Basis: Letter Grade

INFO 2001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

Grading Basis: Letter Grade

INFO 2131 (4) Ecosystems Seminar and Studio

Provides direct experience analyzing complex social systems of systems and develops students' ability to learn to listen for (and mediate among) diverse, discordant voices and values within larger communities, organizations and institutions. Employs a variety of qualitative research techniques in the studio, including interviewing, participant observation and ethnographic reflections on differences in communities of practice.

Requisites: Requires enrollment in corequisite course of INFO 2132.

Grading Basis: Letter Grade

INFO 2132 (3) Information Science Ecosystems Seminar

Surveys key concepts and theories in Information Science, focusing on the ways that communities, organizations and institutions influence the design and use of information. Students will critically examine texts, systems and interpretations of data from multiple disciplinary perspectives that speak to the complex interactions among the people and technologies that surround us and the ecosystems form by and through data.

Requisites: Requires enrollment in corequisite course of INFO 2131.

Grading Basis: Letter Grade

INFO 2201 (3) Computational Reasoning 2: Representations of Data

Surveys techniques for representing data and expressing relationships among data, both at small scales (for example, via programmatic data structures) and at large scales (for example, in various kinds of database systems). Introduces fundamentals of algorithm analysis and the trade-offs involved in managing data using different approaches, tools and organizing principles.

Requisites: Requires prerequisite course of INFO 1201 or CSCI 1300 or CSCI 1310 (minimum grade C-).

Grading Basis: Letter Grade

INFO 2301 (3) Quantitative Reasoning 2: Uncertainty and Inference

Introduces intermediate-level methods for quantitative data analysis, focusing on foundational concepts in probability and statistical inference along with complementary computational skills and tools. The course will cover basic probability concepts, common probability distributions and methods for estimating their parameters, multivariate regression with applications to forecasting and classification and a variety of methods of statistical significance testing.

Requisites: Requires prerequisite course of INFO 1201 and INFO 1301 (all minimum grade C-).

Grading Basis: Letter Grade

INFO 3001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen fields.

Grading Basis: Letter Grade

INFO 3101 (3) History of Information, Science and Society

Focusing on two topics: the changing role of information in everyday life over time and the increasing role of information in disciplinary studies such as social science, engineering, computer science, mathematics, digital humanities. Examines information related academic disciplines, businesses, industries and technologies from multiple perspectives from the 17th century to the present.

Grading Basis: Letter Grade

INFO 3401 (3) Information Exploration

Teaches students how to use information to identify interesting real world problems and to generate insight. Students will learn to find, collect, assemble and organize data to inspire new questions, make predictions and work towards solutions. They will learn to appropriately apply different methods (including computational, statistical and qualitative) for exploratory data analysis in a variety of domains.

Requisites: Requires prerequisite course of INFO 2201 and INFO 2301 and INFO 1121 or INFO 2131 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 3402 (3) Information Exposition

Teaches students to communicate information to a wider audience and construct stories with data across a variety of domains. Students will learn to use data for rhetorical purposes, applying visual, statistical and interpretative methods. Students will learn to think critically about ethical and social implications of using data in expository media, including identification of bias.

Requisites: Requires prerequisite course of INFO 1301 or INFO 2301 (minimum grade C). Restricted to students with 57-180 credits (Junior or Senior) Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 3501 (3) Problems in Information Science: Peer Production and Crowdsourcing

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations. Problems in Information Sciences is a series that brings contemporary research to the classroom in the form of progressive, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5501

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 3502 (3) Problems in Information Science: Online Communities

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5502

Grading Basis: Letter Grade

INFO 3503 (3) Problems in Information Science: Everyday Information Behavior

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information on line. Students learn to analyze the informational dimensions that occur in their everyday lives.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5503

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 3504 (3) Problems in Information Science: Digital Identity

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. "Problems in Information Science" is a series that brings contemporary research to the classroom in the form of progress, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5504

Grading Basis: Letter Grade

INFO 3505 (3) Problems in Information Science: Designing for Creativity and Learning

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5505

Grading Basis: Letter Grade

INFO 4001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

Grading Basis: Letter Grade

INFO 4601 (3) Ethical and Policy Dimensions of Information, Technology and New Media

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5601

Requisites: Restricted to students with 55 or more hours.

Grading Basis: Letter Grade

INFO 4602 (3) Mastery in Information Science: Information Visualization

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5602

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 4603 (3) Mastery in Information Science: Survey Research Design

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5603

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 4604 (3) Applied Machine Learning

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5604

Requisites: Requires prerequisite courses of INFO 2201 and INFO 2301 (all minimum grade D-).

Grading Basis: Letter Grade

INFO 4605 (3) Mastery: Ethnographic Research in Applied Settings

Familiarizes students with ethnography as a research tool as it is used in corporate and consulting research. Systematically explores issues and topics in research for the purposes of product design and development.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5605

Requisites: Requires a minimum of 45 hours taken.

Grading Basis: Letter Grade

INFO 4611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5611

Requisites: Restricted to students with a minimum of 45 units.

Grading Basis: Letter Grade

INFO 4700 (3) Senior Capstone

Provides senior level INFO students an opportunity to demonstrate the culmination of their learning in the major by designing and implementing a significant information system or developing a research question, typically in response to a problem of personal interest related to or informed by their secondary area of specialization. Reinforces project planning, public presentation and ethic skills.

Requisites: Restricted to Information Science (INFO) majors only with a minimum of 90 hours.

Grading Basis: Letter Grade

INFO 4800 (1-3) Leadership Practicum in Information Science

Equips students for taking on leadership roles in the interdisciplinary context of information science. Students will learn to facilitate learning among students with diverse backgrounds and expertise, developing communication and mentoring skills and gaining exposure to a variety of learner-centered design strategies and pedagogical approaches. Enrollment is by invitation and at the discretion of the instructor.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 4841 (1-4) Undergraduate Independent Study

Undergraduate independent study.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 4871 (3) Special Topics

Special topics.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 4900 (1-6) Research Experience in Information Science

Provides research experience in information science. Students will contribute to the construction of new knowledge of novel systems, helping to answer current research questions or to solve contemporary problems in the domain. Enrollment is by invitation and discretion of the advising faculty member.

Repeatable: Repeatable for up to 12.00 total credit hours.

Grading Basis: Letter Grade

INFO 4931 (1-6) Undergraduate Internship

Undergraduate internship.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Information Science (INFO) majors only.

Grading Basis: Letter Grade

Information Science - Bachelor of Science (BS)

Undergraduate students in the Department of Information Science will learn to collect, analyze and interpret many different information sources to understand our world. They will study how we interact with all things digital, including software, devices and algorithms. By the time students graduate, they'll be able to create social and technological solutions that are truly engaging for those who use them, apply those solutions to real problems and evaluate their effectiveness.

Students will also apply information science to the topics that matter to them. From journalism to music to healthcare, students will gain tools that can address many problems. By applying their new knowledge, they'll address real problems and create an impact on our society.

Requirements

The BS in information science requires 54 credit hours within the major. Students will also complete the CMCI Core as part of their general education. A secondary area of study, which is also part of the CMCI Core, will be used to synthesize knowledge of information science with an application domain.

The Portfolio & Professionalization as well as the Capstone courses are a critical part of cohort-building in the major, and are designed to create a community of learners who are prepared to tackle ambitious projects together, individually, and in preparation for internship and post-baccalaureate opportunities.

Information Science Courses in the CMCI Core

INFO 1201	Computational Reasoning 1: Expression and Media Transformation	3
INFO 1301	Quantitative Reasoning 1: Intuitions and Evidence	3
Total Credit Hours		6

Foundations

INFO 1111	Representations Seminar and Studio	3
INFO 1121	Interactions Seminar and Studio	4
INFO 1201	Computational Reasoning 1: Expression and Media Transformation	3
INFO 1301	Quantitative Reasoning 1: Intuitions and Evidence	3
INFO 2131	Ecosystems Seminar and Studio	4
INFO 2201	Computational Reasoning 2: Representations of Data	3
INFO 2301	Quantitative Reasoning 2: Uncertainty and Inference	3
Total Credit Hours		23

Digital Landscapes

Information science majors are required to take three courses (a total of at least nine credit hours) from a list of approved courses that meet the "digital landscapes" requirement. These may come from inside or outside Information Science. An example course from within the department would be INFO 3101. Courses from other majors within CMCI that would satisfy the Digital Landscapes requirement would include MDST 3002 or JRNL 1000, among others.

Information Exploration & Exposition Series

Information Science students will take both Information Exploration and Information Exposition. Though not required, we highly recommend that Information Science majors take these courses in sequence.

INFO 3401	Information Exploration	3
INFO 3402	Information Exposition	3
Total Credit Hours		6

Portfolio/Profession and Capstone Series

The Department of Information Science values project-based learning, team-based learning, the development of good professional practice, and the development of specializations at the undergraduate level. The Portfolio & Professional Development as well as the Capstone courses are a critical part of cohort-building in the major, and are designed to create a community of learners who are prepared to tackle ambitious projects together, individually, and in preparation for internship and post-baccalaureate opportunities.

INFO 2001	Information Science Portfolio and Professional Development	2
INFO 3001	Information Science Portfolio and Professional Development	1
INFO 4001	Information Science Portfolio and Professional Development	1
Total Credit Hours		4

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

Senior Capstone

The senior capstone is under development.

Problems in Information Science and Mastery

Information Science students will take a total of 5 Problems in Information Science and Mastery courses, with a minimum of 2 courses in each category.

Problems in Information Science (multiple)

A series of different courses will be offered in which students deeply engage in specific domains, applying the skills that have been learned in the foundation courses through instructor-guided research of a progressive series of timely problems about the domain. Problems in Information Science are domain-guided versions of Information Exploration and Information Exposition combined in one course. Examples of Problems in Information Science courses include: Digital Identity, Kids and Creative Learning, Information Behavior in Everyday Environments, Crisis Informatics, Digital Humanities, Health Informatics, Philanthropic Informatics, Online Communities.

Information Science Mastery (multiple)

A series of different courses will offer deep dives into theory and methods in different areas of Information Science. Examples of mastery topics that may be taught include: Applied Machine Learning, Applied Ethnography, Survey research Design, Information Visualization,

Experience Design of Ubiquitous Computing Technology, Crowdsourcing, Information Ethics and Policy.

Secondary Area of Study

In addition to the coursework required for the major, all students in INFO must complete a secondary area of study outside of INFO. This can be met by any of the following: a minor, a second major within CMCI, a double degree, or a credit-based certificate program of at least 12 credit hours offered by a department in any school or college at CU.

Students are encouraged to select one of the programs of study described above, since these have been officially approved by experts who can either provide a formal certificate or list the minor on a student's official transcript upon graduation. In exceptional circumstances, however, students may apply to complete an individualized secondary area of study equal to or greater than 18 credit hours. Application for an individualized secondary area of study must be submitted and approved before the student has earned 50 credit hours.

Information Science - Minor

The minor in information science will draw from courses in Foundations, Exploration and Exposition, Digital Landscapes, Problems in Information Science and Mastery. The minor is currently under formal review; details of the requirements will be available on the CMCI website once it is approved.

Required Course

INFO 1111	Representations Seminar and Studio	4
INFO 2201	Computational Reasoning 2: Representations of Data	3
or INFO 2301	Quantitative Reasoning 2: Uncertainty and Inference	
INFO 1121	Interactions Seminar and Studio	4
or INFO 2131	Ecosystems Seminar and Studio	

Electives

Select any two of the following ¹		6
INFO 3401	Information Exploration	
INFO 3402	Information Exposition	
INFO 3501	Problems in Information Science: Peer Production and Crowdsourcing	
INFO 3502	Problems in Information Science: Online Communities	
INFO 3503	Problems in Information Science: Everyday Information Behavior	
INFO 3504	Problems in Information Science: Digital Identity	
INFO 3505	Problems in Information Science: Designing for Creativity and Learning	
INFO 3xxx	Digital Landscapes	
INFO 4605	Mastery: Ethnographic Research in Applied Settings	

Total Credit Hours 17

¹ Optimal path includes at least one of Exploration, Exposition or Problems.

Journalism

The Department of Journalism is founded on the principle that a well-informed and engaged public is essential to democracy—perhaps more

so now, at a time of dizzying change, than it has ever been; and that, in the face of this change, journalism retains a unique role in contributing to civic life and to the quality of public discourse.

We put this principle to work by helping students become constructive participants in an ever-evolving global media landscape, where distinctions between producers and consumers of content have blurred. More specifically, we prepare them, at both the undergraduate and graduate levels, for careers in journalism and other fields of public communication. We train students to gather information from a diversity of sources, to analyze it critically, and to report what is significant, through stories and other media forms across multiple media platforms. We encourage ethical awareness so that students will think independently, being prepared to reflect on and to help shape media practices and norms rather than take them at face value.

We believe in the integration of classroom instruction with practical experience. Many of our students work for, and manage, campus online news and entertainment sites, television programs and a radio station. They intern at broadcast stations, newspapers, magazines, websites and social media companies. Lastly, as a faculty, and with the help of colleagues elsewhere in our College who are working on new and innovative forms of human communication, we are committed to improving journalism through pioneering research and creative work.

Course code for this program is JRNL.

Bachelor's Degree

- Journalism - Bachelor of Arts (BA) (p. 796)

Minor

- Journalism - Minor (p. 797)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackland, Len
Professor Emeritus

Brinkman, P. Delbert
Professor Emeritus

Browne, Jeffrey William (https://experts.colorado.edu/display/fisid_153439)
Instructor; MEd, University of Florida

Daugherty, Paul J (https://experts.colorado.edu/display/fisid_128801)
Senior Instructor; MA, University of Colorado Boulder

Ferrucci, Patrick Richard (https://experts.colorado.edu/display/fisid_156307)
Assistant Professor; PhD, University of Missouri-Columbia

Jones, Stephen B (https://experts.colorado.edu/display/fisid_101578)
Senior Instructor; PhD, University of Utah

Kaplan, Frank L.
Professor Emeritus

Kim, Hun Shik (https://experts.colorado.edu/display/fisid_141126)
Associate Professor; PhD, University of Missouri-Columbia

Kodas, Michael George (https://experts.colorado.edu/display/fisid_147577)

Instructor; BS, University of Missouri-Columbia

Kuczun, Sam
Professor Emeritus

McDevitt, Michael Joseph (https://experts.colorado.edu/display/fisid_122949)

Professor; PhD, Stanford University

Mcnamara, Mei-Ling J (https://experts.colorado.edu/display/fisid_158310)

Assistant Professor; PhD, Univ of Edinburgh (Scotland)

Moritz, Marguerite J.
Professor Emeritus; PhD, Northwestern University

Raybon, Patricia
Professor Emeritus

Ryan, Kathleen Marie (https://experts.colorado.edu/display/fisid_148481)

Associate Professor; PhD, University of Oregon

Skewes Cummings, Elizabeth (https://experts.colorado.edu/display/fisid_122724)

Associate Professor; PhD, Syracuse University

Voakes, Paul S (https://experts.colorado.edu/display/fisid_130279)

Professor; PhD, University of Wisconsin-Madison

Whitt, Jan (https://experts.colorado.edu/display/fisid_103027)

Professor; PhD, University of Denver

Yulsman, Thomas H (https://experts.colorado.edu/display/fisid_109386)

Professor; MS, Columbia University In the City of New York

JRNL 1000 (3) Principles of Journalism and Networked Communication

Surveys the history, practices and responsibilities of journalism in a democracy. Examines ethics, best practices in institutional and network settings, reporting and writing, international news systems, personal branding, and strategies for creating and distributing content across media platforms. Promotes the highest professional values and encourages students to be leaders who recognize the possibilities of journalism in a democratic society.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) undergraduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 1871 (1-3) Special Topics for First-Year Students

Special studies in media that are specific for first-year students. May be repeated for a maximum of three credit hours.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 2001 (3) Fundamentals of Reporting

Develops basic news-gathering skills for work in news enterprises. Students learn techniques central to research, reporting, writing and producing stories for various media formats.

Requisites: Requires prerequisite course of JRNL 1000 (formerly JOUR/JRNL 2601) (minimum grade C-). Restricted to Journalism (JRNL) majors only.

JRNL 2401 (3) Media Coverage of Diverse Populations

Explores the ways in which issues of gender, gender expression, sexual orientation, race, ethnicity and religion play out in news coverage and how news organizations approach coverage of marginalized groups in society.

Grading Basis: Letter Grade

JRNL 3102 (3) Photojournalism I

Introduces the basic elements of visual communication. Covers the use of camera systems, digital imaging techniques and other aspects of photojournalism including law, ethics, history and critical decision-making.

Requisites: Requires a prerequisite course of JRNL 1000 or (formerly JOUR/JRNL 2601) (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Journalism (JRNL) majors or Program in Journalism Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 3112 (3) Concepts in Visual Culture

Studies the principles, theories and language of visual communication, emphasizing the evaluation and use of images in mass media. Designed to help students build theories and practices learned in previous classes and perfect their skills integrating words and pictures in communication to gain a greater appreciation of the visual world.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3201 (3) Critical Perspectives on Journalism

Introduces students to the critical perspectives most often employed in qualitative analysis of journalistic texts and practice: Marxism, psychoanalytical criticism, semiology, sociological criticism, structuralism, etc. Emphasis is upon texts from contemporary print and broadcast media, although students may also explore documentary film and literary journalism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3202 (3) Covering Political Campaigns

Provides a blend of theoretical understanding and on the ground experience for students interested in learning about the forces that shape election coverage and the practicalities of reporting on the local and national races for public office.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3211 (3) History of Broadcasting

Offers a broad overview of significant broadcast programs, the institutions and sociocultural and economic influences that have steered the course of radio, television and electronic media history in the United States.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3221 (3) History of Digital Journalism

Explores the history, economics and traditions of digital technologies. Addresses the interaction between digital technologies, culture and economy with particular emphasis on the effects on digital journalism. Concludes with a focus on how these concepts are embraced by new journalism market models.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3231 (3) History of Documentary Film

Explores the evolution of the documentary, both in feature films and on television, to understand how the genre offers both historical context and an understanding of the world in which we live.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3241 (3) History of Journalism

Explores the foundations of journalism practice in a historical context. Students study the evolution of the news industry and analyze examples of contemporary broadcasting, photography, online and print media in light of the past.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3401 (3) Sociology of News

Provides students with an introduction to the factors that shape news reporting and production, including gatekeeping, intermedia agenda setting, pack journalism, beat structures, news values and issues unique to the various platforms on which news is delivered.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3402 (3) Social Media Storytelling

Investigates the theory, ethics and best practices in storytelling across a variety of social media platforms including, but not limited to, Facebook, Twitter, Instagram, Snapchat, Medium and YouTube. Examines best practices for social media engagement. Students develop a story for multiple platforms and analyze the story performance on the sites and make recommendations for best practices.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3552 (3) Editing and Presentation

Explores copy editing, graphic principles and processes, new media technology.

Requisites: Requires prerequisite course of JOUR/JRNL 2001 or JRNL 1000 (formerly JOUR/JRNL 2601) (minimum grade C-). Restricted to Journalism (JRNL) or News Editorial (NSED-BSJR or JNED-BSJR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 3614 (3) Principles of Audio Production

Introduces audio production techniques using digital technologies. Students learn to apply fundamental principles to create professional radio and online programs including podcasting.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) or Program in Journalism and Mass Communication (JOUR) majors with a minimum of 45 hours taken.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 3644 (3) Principles of Television Production

Emphasizes the use of video technologies in both field and studio production, camera and editing work, producing and directing for professional program production.

Requisites: Requires prerequisite course of JRNL 2001 or JRNL 1000 (formerly JOUR/JRNL 260; min grade D-). Restricted to JRNL or BCNS-BSJR or JBCN-BSJR or BCPM-BSJR or JBCP-BSJR majors only with a min of 57 hours taken.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 3651 (3) Media Law and Ethics

Studies state and federal laws and court decisions that affect the media in order to develop knowledge of media rights and responsibilities and an understanding of the legal system. Provides students with an overview of the theory, ethics, codes, and analytical models that are used in journalism, and introduces students to a variety of ethical issues that can arise in journalism.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) undergraduate students only.

JRNL 3674 (3) Television Production 2

Covers studio productions for "Newsteam Boulder." Students also do field projects to sharpen their writing, video production, and editing skills.

Requisites: Requires prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 3704 (3) Sports Writing

Prepares students for the world of sport journalism. Combines the skills of a hard news reporter, the perspective of an entertainment reporter and the persuasive abilities of an editorial writer.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3804 (3) Sports, Media and Society

Examines how sports, culture and especially the media, with a specific focus on journalism, all come together to influence society. Explores how sports communication affects, and is affected by, the issues and tension that touch society at large, such as law and politics, race, gender, sexuality and disability.

Equivalent - Duplicate Degree Credit Not Granted: MDST 3331

Requisites: Restricted to students with a minimum of 29 credits completed.

Grading Basis: Letter Grade

JRNL 4002 (3) Reporting 2

Assumes mastery of basic reporting and writing skills. Students produce more sophisticated stories on a variety of topics.

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted Journalism (JRNL) or News Editorial (NSED-BSJR or JNED-BSJR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4011 (3) Principles of Media Relations

Provides students with information about the ethics, history and practice of media relations (community affairs, community relations, customer relations, government relations, industry relations, internal communications, public relations, press agency, public affairs, publicity, etc.). Introduces students from multiple academic disciplines to the genres of writing required for a media relations career.

Grading Basis: Letter Grade

JRNL 4102 (3) Photojournalism Portfolio

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5102

Requisites: Requires a prerequisite course of JOUR/JRNL 3102 (minimum grade C-).

Additional Information: Departmental Category: Print Online Journalism

JRNL 4311 (3) Literary Journalism

Studies the contributions of American literary journalists from Sara Davidson, Joan Didion, Normal Mailer, Hunter S. Thompson and Tom Wolfe; to established writers of nonfiction, including Annie Dillard, Jon Krakauer, Jane Kramer, Adrian Nichole LeBlanc and Terry Tempest Williams; to the newest wave of long-form journalists. Explores the boundaries between fiction and nonfiction and the literary techniques that distinguish creative nonfiction and literary journalism from other reportorial and storytelling forms.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4344 (3) Video Documentary Production

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5344

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4351 (3) Reporting Wars, Conflict and Peace

Explores how journalists report international breaking news with a focus on war, disaster and peace and how these news events affect peoples' lives, governmental decisions and news media operations.

Requisites: Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication students with a minimum of 73 hours taken.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 4354 (3) TV Reporting

Students learn basic broadcast reporting skills – where to find news and how to cover it, how to analyze and organize news stories. Skills are linked with advanced concepts of shooting and editing videotape in order to produce news stories on deadline.

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4401 (3) News and Public Perception

Considers the impact that news and journalistic practice have on the public through processes like agenda setting and second-level agenda setting, as well as issues such as news avoidance, the spiral of silence and political cynicism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4411 (3) International Media and Global Crises

Investigates how media organizations, audiences and other international organizations function during various global crises, such as national disasters, climate change and health epidemics, due to imbalanced distribution of wealth and resources, ethnic tensions and diplomatic failures.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4502 (3) Reporting 3

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5502

Requisites: Requires prerequisite courses of JRNL 3552 and JRNL 4002 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) News Editorial (NSED or JNED) or Journalism (JRNL) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4562 (3) Digital Journalism

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5562

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4572 (3) News Corps

CU News Corps provides students the opportunity to immerse themselves in a single project and then produce an in-depth text based or multimedia explanatory/investigative story for publication in professional media. Students spend several weeks studying the subject in question before reporting and producing their stories.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4602 (3) Opinion Writing

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5602

Requisites: Requires a prerequisite course of JRNL 2001 (minimum grade C-).

Additional Information: Departmental Category: Print Online Journalism

JRNL 4614 (1-3) Advanced Audio Practices

Applies advanced skills in producing in-depth audio programming for radio stations in Colorado and for weekly discussion-critique sessions.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of JOUR/JRNL 3614 (minimum grade C-). Restricted to Journalism (JRNL) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4624 (4) News Team

Students participate in Newsteam Boulder a program broadcast live over the Boulder cable television system.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5624

Requisites: Requires prerequisite course of JOUR/JRNL 4354 (minimum grade D-). Restricted to Journalism (JRNL) or Broadcast News (BCNS - BSJR or JBCN-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4634 (1-3) Broadcast Projects

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Prepares radio or television documentaries and informational/entertainment programs.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5634

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4651 (3) Advanced Media Ethics

Examines the responsibilities, the power and the problems of news media through the lens of ethical inquiry. Applies the philosophical and other perspectives from humanities and social sciences to consider ethical frameworks for guiding journalism in an era of technological disruption. Examines issues including privacy, conflicts of interest, undercover reporting, use of graphic images, interviewing trauma victims and other concerns in journalism through the lens of moral philosophy, best practices and codes of ethics.

Requisites: Requires prerequisite course of JRNL 3651 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4674 (1-3) Television Production 3

Provides in-depth experience in directing and producing television programs.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of JOUR/JRNL 3674 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4684 (3) Advanced Camera and Editing

Emphasizes the advanced techniques in digital video camera usage and digital editing for professional broadcast video production.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5684

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4702 (3) Arts/Cultural Reporting and Criticism

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5702

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4704 (3) Athletic Media Relations

Offers the opportunity to both observe and experience what is required to work in the world of intercollegiate athletic media relations and professional sports public relations. Covers how to write and how to budget the vital components of publications, media bias and crisis management.

Requisites: Requires prerequisite course of JRNL 3704 (minimum grade C-).

Grading Basis: Letter Grade

JRNL 4714 (3) Sports Broadcasting

Teaches students how to do live sports television production. Students will learn the sports TV business from the ground up and be responsible for participating in the broadcasting of three to four live sporting events.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4724 (3) Sports Announcing

Teaches students about sports talk and sports announcing, how to interview sports celebrities and the legal considerations and ethics of the business. Students will be doing play-by-play and color of live sporting events.

Grading Basis: Letter Grade

JRNL 4802 (3) Feature Writing

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5802

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4822 (3) Reporting on the Environment

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5822

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

JRNL 4872 (1-3) Special Topics: Print

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5872

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors with a minimum of 57 hours taken.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4874 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Journalism (JRNL or JOUR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Journalism - Bachelor of Arts (BA)

Journalism majors develop skills in information gathering, storytelling and analysis across a variety of platforms—including television, social media, mobile devices, radio and print—using an ever-expanding variety of media tools and technologies. In addition to their professional preparation, students take courses in a core curriculum that provides a

range of conceptual and interdisciplinary options and, in consultation with a faculty member, develop an individualized secondary area of concentration (18 credit hours). Students complement their skill competencies with a study of ethics, history, international media, law, literary journalism, news and public perception, sociology of news, visual culture, and other conceptual courses offered in the department and elsewhere in the college and university.

We offer a curriculum with these learning goals:

- Communicate to various public audiences with clarity and precision, using the most effective combination of images, sounds and words, and applying the most appropriate contemporary technologies.
- Gather information, through research, observation and interviews, and evaluate what is gathered.
- Acquire expertise in a particular subject and use that expertise to communicate clearly to various public audiences.
- Base journalistic work on such enduring ethical principles as accountability, fairness, accuracy, responsibility and diversity.
- Think analytically, critically and creatively about the social, historical, economic and scientific forces that underlie daily events, in order to provide appropriate context in the reporting of daily events.
- Apply the laws of freedom of expression, in both the United States and in a global media setting.
- Blend entrepreneurial strategies with journalistic enterprise to enable success in a fast-changing economic environment.

Requirements

Within the college standard of 120 credit hours for the bachelor’s degree, the BA in journalism requires 36 credit hours as follows.

Required Courses and Semester Credit Hours

JRNL Core Curriculum		
JRNL 1000	Principles of Journalism and Networked Communication	3
JRNL 2001	Fundamentals of Reporting	3
JRNL 3651	Media Law and Ethics	3
One upper-division reporting course ¹		3
Two conceptual courses in journalism ²		6
Capstone		3
JRNL 4931	Internship	1-6
Other Courses in Journalism		
Electives ³		12
Total Credit Hours		34-39

¹ These include Advanced Reporting, TV Reporting, CU News Corps, Arts and Cultural Reporting, Feature Writing and others.

² These include Advanced Ethics, Media Coverage of Diverse Populations; Concepts in Visual Culture; Critical Perspectives on Journalism; History of Documentary Film; History of Journalism; History of Broadcasting; History of Digital Journalism; Sociology of News; Literary Journalism; International Media and Global Crises; Reporting Wars, Conflict and Peace; News and Public Perception and others.

³ Students choose from a variety of advanced journalism courses, including but not limited to the following: Covering Political Campaigns; Editing and Presentation; Advanced Reporting; TV Reporting; Opinion Writing; Broadcast Projects; Advanced Camera and Editing; Arts and Cultural Reporting; Feature Writing; Media Coverage of Diverse Populations; Concepts in Visual Culture; Critical Perspectives on Journalism; History of Documentary Film; History of Journalism; History of Broadcasting; History of Digital Journalism; Sociology of News; Literary Journalism; International Media and Global Crises; Reporting Wars, Conflict and Peace; News and Public Perception and others.

Secondary Area of Study (18 credit hours)

In addition to the coursework required for the major, all students in JRNL must complete a secondary area of study outside of JRNL. This can be met by any of the following: a minor, a double degree, a second major outside CMCI, or an approved minor substitute composed of at least 18 credit hours. Application for a minor substitute must be submitted and approved before the student has earned 50 credit hours.

Journalism - Minor

In consultation with their advisers, students who are majoring in another discipline may pursue a minor in journalism.

Requirements

Students must complete 18 credit hours of course work toward the minor with a grade of C- or better and an overall GPA in the minor of 2.0. Students may apply no more than six credit hours of transfer work, including three hours of upper-division credit.

Students will take only one required course, JRNL 1000, which will introduce them to a range of possible interests from broadcasting to print and online media to digital and emerging media. After successfully completing JRNL 1000, students should select one 2000-level course and four 3000- or 4000-level journalism courses.

Students may want to emphasize conceptual and theory courses, may select skills courses that help to prepare them for possible careers, or complete a combination of the two.

Required Courses and Semester Credit Hours

Required Course		
JRNL 1000	Principles of Journalism and Networked Communication	3
Electives		
Select one 2000-level JRNL course from the following:		3
JRNL 2001	Fundamentals of Reporting	
JRNL 2401	Media Coverage of Diverse Populations	
Select four 3000- or 4000-level JRNL courses from the following:		12
JRNL 3112	Concepts in Visual Culture	
JRNL 3201	Critical Perspectives on Journalism	
JRNL 3202	Covering Political Campaigns	
JRNL 3211	History of Broadcasting	
JRNL 3221	History of Digital Journalism	
JRNL 3231	History of Documentary Film	
JRNL 3241	History of Journalism	
JRNL 3401	Sociology of News	
JRNL 3552	Editing and Presentation	

JRNL 3644	Principles of Television Production
JRNL 3651	Media Law and Ethics
JRNL 4002	Reporting 2
JRNL 4011	Principles of Media Relations
JRNL 4311	Literary Journalism
JRNL 4351	Reporting Wars, Conflict and Peace
JRNL 4401	News and Public Perception
JRNL 4411	International Media and Global Crises
JRNL 4572	News Corps
JRNL 4602	Opinion Writing
JRNL 4702	Arts/Cultural Reporting and Criticism
JRNL 4802	Feature Writing
JRNL 4822	Reporting on the Environment
<hr/>	
Total Credit Hours	18

Media Studies

The Department of Media Studies specializes in sophisticated, cutting-edge research on the media technologies that underlie contemporary culture, economy and politics. Students learn how media industries, practices, and narratives shape the way we think about and relate to the world around us. Enter our tight-knit community and participate in innovative media production work and research projects that engage emerging technology practices, seek to understand new digital cultures, and strive to change society in meaningful ways.

Media Studies students examine ways of thinking about and conducting research into the intersection of media, communication and cultural practices in both historical and contemporary perspectives. Encompassing humanistic, social scientific and artistic approaches to the study of media and culture, and interdisciplinary in its theoretical and methodological approaches, the media studies degrees span traditional boundaries between theory and practice. The program fosters media "literacy" in the broadest sense by providing students with critical skills to analyze contemporary media and culture, along with technical, aesthetic and intellectual principles that facilitate strong media practices.

Course code for this program is MDST.

Bachelor's Degree

- Media Studies - Bachelor of Arts (BA) (p. 801)

Minor

- Media Studies - Minor (p. 802)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berggreen, Shu-Ling Chen (https://experts.colorado.edu/display/fisid_101636)
Associate Professor; PhD, University of Tennessee-Knoxville

Calabrese, Andrew (https://experts.colorado.edu/display/fisid_101073)
Professor; PhD, Ohio State University

Echchaibi, Nabil (https://experts.colorado.edu/display/fisid_145054)
Associate Professor; PhD, Indiana University Bloomington

Goldstein, Donna M (https://experts.colorado.edu/display/fisid_100448)
Associate Professor; PhD, University of California-Berkeley

Hall, Kira (https://experts.colorado.edu/display/fisid_123111)
Associate Professor; PhD, University of California-Berkeley

Hoover, Stewart (https://experts.colorado.edu/display/fisid_104549)
Professor; PhD, University of Pennsylvania

McLean, Polly E (https://experts.colorado.edu/display/fisid_100614)
Associate Professor; PhD, University of Texas at Austin

Mody, Bella
Professor Emeritus; PhD, Gujarat University, India

Peck, Janice Anne (https://experts.colorado.edu/display/fisid_106765)
Professor; PhD, Simon Fraser University (Canada)

Rowland, Willard D.
Professor Emeritus

Schneider, Nathan Todd (https://experts.colorado.edu/display/fisid_156512)
Scholar In Residence; MA, University of California-Santa Barbara

Stevens, John Richard (https://experts.colorado.edu/display/fisid_145848)
Associate Professor; PhD, University of Texas at Austin

Tracey, Michael (https://experts.colorado.edu/display/fisid_104259)
Professor; PhD, Univ of Leicester (England)

Trager, Robert
Professor Emeritus

MDST 1001 (3) Foundations of Media Studies

Introduces students to key issues and debates and contemporary applications of critical media studies focusing on economic, social, political and cultural implications. Provides an understanding of the relationship between theory and practice and equips students with the tools to critically analyze various forms of textual transmission.

Grading Basis: Letter Grade

MDST 1002 (3) Introduction to Social Media

Introduces students to network structures and principles, the technology and infrastructures that allow them to flourish, and the cultures that grow up through and around them. Explores how social media enables community, how it assembles and empowers agents of change and how design informs individual and group behavior.

Grading Basis: Letter Grade

MDST 2001 (3) Global Media Literacy

Explores the expanding nature of literacy in a digital world and changes in the meanings and practices of literacy over time. Prepares students to access, analyze, evaluate, create and engage with media in a variety of forms. Acquire competencies in evolving multimedia environments by critically evaluating media messages.

MDST 2002 (3) Media and Communication History

Examines the historical development of communication forms, tools, technologies and institutions (orality, writing, printing, photography, film, radio, television, computers, internet); their influence on culture (forms of expression and social relationships); and their impact on social and individual experience. Applies knowledge of communication history to contemporary social issues and problems in media and society, domestically and internationally.

MDST 2010 (3) Media and Social Movements

Surveys the history and contemporary efforts of social activists to bring about democratic media reform and examines how media are used as tools for connecting and advancing social movements. Emphasis is given to media activism and social movements in the United States, as well as to similar and related transnational activism and movements.

Requisites: Requires a prerequisite course of MDST 1001 (minimum grade C-).

Grading Basis: Letter Grade

MDST 2011 (3) Disruptive Entrepreneurship in the Internet's New Economies

Grapples with the disruptive business models that drive the online economy: both the dominant ones and the alternatives vying to transform it. In addition to the Silicon Valley model, this course explores lesser known internet economies around the world and proposals for a more equitable online future.

Grading Basis: Letter Grade

MDST 2012 (3) Hacker Culture

Chronicles the evolution of hacker culture from its origins as a geeky subculture to a criminal underground to its adaptation by CEOs. Considers how hacker formations sometimes represent a new kind of politics, sometimes a rejection of politics. Explores the contested figure of the hacker in the past, present and science-fiction of the internet.

Grading Basis: Letter Grade

MDST 2021 (3) Comic Books: Culture and Industry

Explores practices of comic culture across a broad range of graphic stories. Using culture studies approaches to industry analysis and fan community discourses, students examine culture created through and around graphic texts, particularly representations of race, gender, sexuality, institutions and ideology. Considers the political economy of the comic industry, the struggles of independent producers and active fan practices.

Grading Basis: Letter Grade

MDST 2031 (3) Documentary and Social Change

Explores how local, national and international filmmakers use documentaries to provide cultural observation, education, entertainment and memories to making sense of and transform the realities of contemporary societies. Emphasizes contemporary issues and practices in the production of documentaries, including the participatory means such as the crowdsourcing of documentary footage and the use of newer, non-theatrical means of distribution.

Grading Basis: Letter Grade

MDST 3001 (3) Media Research

Introduces theoretical approaches and practices used to analyze the content, structure, influence and contexts of media. Explores factors shaping media, including: politics, economics, technology, cultural traditions. Studies concepts, theoretical approaches and research methods of media criticism, and adopts and adapts these frameworks in analyses of mediated communication.

MDST 3002 (3) Digital Culture and Politics

Examines issues at the intersection of digital media, culture and politics, such as regulation and network architecture, piracy and hacking, and grassroots activism. Engage with a range of theories about cultural politics, democracy, liberalism and neo-liberalism in relation to digital information and communication technologies.

MDST 3201 (3) Media, Culture and Globalization

Surveys the political and economic structures of media system in developed and developing countries and discusses the impact of privatization, ownership consolidation, and globalization on the flow of information across national borders. Also looks at how global media flows and counter-flows affect conceptions of nationhood and cultural identity.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) or International Affairs (IAFS) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 3321 (3) Media Industries and Economics

Focuses on the institutions and practices of the media industries. Surveys the histories, structures, and activities of these organizations and the contemporary issues surrounding them.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 3331 (3) Sports-Media Complex

Explores the rich connections between the sports industry, spectating, the media complex and social life. Using theories of cultural studies and drawing on specific examples from the sports world, students focus on how sport shapes and reinforces understandings of gender, race, class and sexuality. Addresses major questions about the political economy, commodification, mediation and reception of the spectacle of the sports complex, as well as politics and cultural consequences of its transnational reach.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 3804

Grading Basis: Letter Grade

MDST 3341 (3) Designing Alternative Media Platforms

Explores alternative forms of media to exhibit student research and build connections with community leaders. Surveys alternative exhibition traditions such as Social Practice, Relational Aesthetics and Craftivism to expand the impact of student work, culminating in the design of a unique cultural event focusing on each individual's research. Software/digital presentation skills.

MDST 3401 (3) Media, Food and Culture

Explores the topic of food as a subject of popular culture: essential to life and the enter of local, national and transnational conflict and social movements. Students will examine media representations of food, what our food choices say about us and what the mediated politics of food mean for our collective future.

Requisites: Requires a prerequisite course of MDST 2002 (minimum grade C-).

Grading Basis: Letter Grade

MDST 3711 (3) Media and Popular Culture

Examines culture in the form of discourse, symbols, and texts transmitted through the media. Explores the relationship between such mediated culture and social myth and ideology.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 3791 (3) Media and the Public

Provides an overview of how publishing in print and electronic forms has been tied closely to democratic ideals for centuries. Explores how the idea of the public is central to the theory and practice of media politics, and how the contested concepts of "the public sphere" and "public opinion" have long been linked to debates about the proper relationship between media and democratic citizenship.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4111 (3) Crime, Media and Contemporary Culture

Addressed in the course are a range of issues from within a variety of literatures that consider the ways in which the media cover crime. Those literatures are particularly drawn from sociology and the emergent, and increasingly dominant, field of cultural criminology. The focus of the class is to get students to think of "crime" as a constructed and mediated concept and set of narratives that often create problematic public "understandings".

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

MDST 4211 (3) Asian Media and Culture

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

Equivalent - Duplicate Degree Credit Not Granted: MDST 5211

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Asia Content

MDST 4221 (3) Media Technology and Cultural Change

Explores how media technologies affect social orders and shape cultural practices across the globe. Compares and critically evaluates different theories of technology, emphasizes the social construction of technology, asks how media technologies inform conceptions of social reality and individual identity and considers how media technologies can be understood across a range of academic disciplines.

Requisites: Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Grading Basis: Letter Grade

MDST 4231 (3) Youth Media: Culture and Politics

Emphasizes the sociological understandings of youth cultures, identities and practices in relation to media and politics. Topics include the influences of consumer branding, participatory culture, youth media production and representation, use of social media, mobile phones, gaming, and other digital media, and integrating them around themes of youth styles, gender, ethic, political identities, consumer culture, social behavior and other trends.

Requisites: Requires prerequisite course of MDST 3711 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

MDST 4311 (3) Mass Communication Criticism

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

Equivalent - Duplicate Degree Credit Not Granted: MDST 5311

MDST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture

Studies the construction, interconnections, and replications of gender, race, class, and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4341 (3) International Media and Global Crises

Examines strengths and limits on media's role in globalized crises (e.g. financial, climate change, health) in light of changing distribution of global power. Introduction to current crises; context-analytical approach to media technologies, financing and uses; application to national cases.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Media Studies (MDST) or International Affairs (IAFS) majors only.

Additional Information: Departmental Category: Asia Content

MDST 4361 (3) TV and the Family in American Culture and Society

Examines the history and character of two central institutions in American society—the family and television—to gain deeper understanding of their formative and enduring roles. Topics include: intersecting histories of the family and television; economic logic of the TV industry and programming; representations of the family in television programming; how families use and interact with television.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4371 (3) Media and Religion

Examines the way religion uses media as a social and political force. Introduces the major themes and trends in the mediation of religion and the religious inflection of the media in professional, popular, and emerging media contexts.

MDST 4372 (3) Islam, Pop Culture and Media

Explores the shifting boundaries of cultural and religious Muslim identities through media representation and production in Muslim-majority countries and in the West. Using popular culture as a complex site of struggle, this course examines how Muslims address questions of gender, ethnicity, class, democracy, sexuality, religion, and modernity in a variety of media forms and practices.

Grading Basis: Letter Grade

MDST 4401 (3) Fan and Audience Studies

Considers how audiences and fans are conceptualized, how they are constructed by media enterprises and how they operate within their cultural ecosystems. While media shape the sociocultural, political and economic dimensions of the social world, fan studies suggest a more active set of practices form sites of resistance and enable a greater degree of influence over cultural production.

Requisites: Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (all minimum grade C-).

Grading Basis: Letter Grade

MDST 4601 (3) Media Law, Policy and Ethics

Explores ethical and legal complexities of information and communication technology. Combines real-world inquiry with creative speculation to probe everyday ethical dilemmas faced by digital consumers, creators and coders, as well as policy-makers. Explore themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

Grading Basis: Letter Grade

MDST 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4871 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with a minimum of 75 hours taken.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Media Studies (MDST) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

Media Studies - Bachelor of Arts (BA)

The Bachelor of Arts in Media Studies emphasizes the creative and analytical skills needed to make sense of current and future trends in media, and to gain a deep understanding of the history and development of various means and forms of communication.

Explorations of media theory, history, criticism, practices, popular culture, technology and emerging cultures are enhanced by practical training in media design, storytelling, digital art, online community engagement, documentary filmmaking and social media.

Requirements

Students pursuing the BA in media studies complete 12 courses, for 36 credit hours. MDST requires an internship (3 credit hours—MDST 4931) in a field of the student's choice, and a capstone course (3 credit hours—MDST 4221 or MDST 4401), both usually completed in the senior year.

Required Courses and Semester Credit Hours

MDST Core**Required Courses**

MDST 1001	Foundations of Media Studies	3
MDST 1002	Introduction to Social Media	3
MDST 2002	Media and Communication History	3
MDST 3001	Media Research	3
MDST 3002	Digital Culture and Politics	3

Students would then take six hours of Media Practice courses offered by MDST, other departments or programs in CMCI or departments outside CMCI.¹

Area of Concentration

Select three courses in one of the following:² 9

Media, Technology & Society

MDST 2010	Media and Social Movements
MDST 2011	Disruptive Entrepreneurship in the Internet's New Economies
MDST 2012	Hacker Culture
MDST 2021	Comic Books: Culture and Industry
MDST 3331	Sports-Media Complex
MDST 3341	Designing Alternative Media Platforms
MDST 3401	Media, Food and Culture
MDST 3711	Media and Popular Culture
MDST 4111	Crime, Media and Contemporary Culture
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture
MDST 4361	TV and the Family in American Culture and Society
MDST 4371	Media and Religion
MDST 4372	Islam, Pop Culture and Media
MDST 4601	Media Law, Policy and Ethics

Global Media Industries & Culture

MDST 2001	Global Media Literacy
MDST 2010	Media and Social Movements
MDST 3201	Media, Culture and Globalization
MDST 3321	Media Industries and Economics
MDST 3331	Sports-Media Complex
MDST 3401	Media, Food and Culture
MDST 4211	Asian Media and Culture
MDST 4371	Media and Religion
MDST 4372	Islam, Pop Culture and Media
MDST 4601	Media Law, Policy and Ethics

Advocacy, Entrepreneurship & Social Change

MDST 2010	Media and Social Movements
MDST 2011	Disruptive Entrepreneurship in the Internet's New Economies
MDST 2012	Hacker Culture
MDST 2031	Documentary and Social Change
MDST 3321	Media Industries and Economics
MDST 3341	Designing Alternative Media Platforms
MDST 3401	Media, Food and Culture
MDST 3711	Media and Popular Culture
MDST 3791	Media and the Public
MDST 4231	Youth Media: Culture and Politics
MDST 4601	Media Law, Policy and Ethics

Self-Designed Concentration³

Total Credit Hours 30

¹ The Media Practice component consists of courses involving hands-on work in the CMCI Departments of Advertising, Public Relations and Media Design; Journalism; Information Science or Critical Media Practices; or in the Technology, Arts and Media program in ATLAS.

² Courses meeting this requirement could come from anywhere within CMCI or across the CU Boulder campus curriculum.

³ The concentrations represent the priorities of the MDST curriculum, but students work with faculty to develop their own concentrated emphasis (to help determine which courses may or may not need to be available). Degree requirements will continue to be consistent: students must complete the core curriculum of courses, must meet the mandated numbers of hours, MDST requires an internship (3 hours) in a field of the student's choice, and a 3 hour capstone course, both usually completed in the senior year. The concentrations represent the priorities of the MDST curriculum, but students work with faculty to develop their own concentrated emphasis (to help determine which courses may or may not need to be available). Degree requirements will continue to be consistent: students must complete the core curriculum of courses, must meet the mandated numbers of hours, MDST requires an internship (3 hours) in a field of the student's choice, and a 3 hour capstone course, both usually completed in the senior year.

Secondary Area of Study

In addition to coursework required for the major, all student in MDST must complete a secondary area of study outside of MDST. This secondary area of study can be met by any of the following: a minor, a second major within CMCI, a double degree, or any credit-based certificate program of at least 12 credit hours.

Media Studies - Minor

The minor in media studies (MDST) allows students to choose from among a wide array of course offerings, which focus on contemporary media topics in one of three recommended concentrations: 1) Global Media Industries & Culture; 2) Media, Technology & Society; and 3) Advocacy, Entrepreneurship & Social Change.

A minimum of 18 credit hours is required for the minor. 9 hours must be courses numbered 3000 or above. All Courses counted toward the minor must be completed with a grade of C- or better. No pass/fail work may be applied. No more than six credit hours of transfer work may be applied to the minor, including 3 hours of upper-division credit. The grade point average for minor degree coursework must be equal to 2.00 or higher.

Track #1: Global Media Industries & Culture

Required Courses

MDST 1001	Foundations of Media Studies	3
MDST 1002	Introduction to Social Media	3
or MDST 2001	Global Media Literacy	

Select Four of the Following 12

MDST 2010	Media and Social Movements	
MDST 3201	Media, Culture and Globalization	
MDST 3321	Media Industries and Economics	
MDST 4211	Asian Media and Culture	
MDST 4371	Media and Religion	
MDST 4372	Islam, Pop Culture and Media	
MDST 4601	Media Law, Policy and Ethics	
MDST 4841	Undergraduate Independent Study	
MDST 4871	Special Topics	

Track #2: Media, Technology & Society

Required Courses

MDST 1001	Foundations of Media Studies	3
MDST 1002	Introduction to Social Media	3

Select Four of the Following

12

MDST 2002	Media and Communication History	
MDST 2012	Hacker Culture	
MDST 2021	Comic Books: Culture and Industry	
MDST 3001	Media Research	
MDST 3002	Digital Culture and Politics	
MDST 3331	Sports-Media Complex	
MDST 3711	Media and Popular Culture	
MDST 4111	Crime, Media and Contemporary Culture	
MDST 4331	Gender, Race, Class, and Sexuality in Popular Culture	
MDST 4361	TV and the Family in American Culture and Society	
MDST 4371	Media and Religion	
MDST 4372	Islam, Pop Culture and Media	
MDST 4601	Media Law, Policy and Ethics	
MDST 4841	Undergraduate Independent Study	
MDST 4871	Special Topics	

Track #3: Advocacy, Entrepreneurship & Social Change

Required Courses

MDST 1001	Foundations of Media Studies	3
MDST 1002	Introduction to Social Media	3

Select Four of the Following 12

MDST 2010	Media and Social Movements	
MDST 2011	Disruptive Entrepreneurship in the Internet's New Economies	
MDST 2012	Hacker Culture	
MDST 2031	Documentary and Social Change	
MDST 3001	Media Research	
MDST 3002	Digital Culture and Politics	
MDST 3321	Media Industries and Economics	
MDST 3791	Media and the Public	
MDST 4601	Media Law, Policy and Ethics	
MDST 4231	Youth Media: Culture and Politics	
MDST 4841	Undergraduate Independent Study	
MDST 4871	Special Topics	

Music

The College of Music provides specialized training designed to prepare students for a variety of careers in music. The college offers three undergraduate degrees, three certificate programs and four graduate degrees; numerous performance opportunities are also available.

Established by the Regents of the University of Colorado in 1920, the College of Music is a fully accredited member of the National Association of Schools of Music.

Mission

The mission of the College of Music at CU Boulder is to promote excellence in music through distinguished instruction in performance, composition, musicology, theory and teacher preparation, and to provide opportunities for performance, creative activities, research and scholarship, and teaching.

The college is dedicated to:

- providing music majors and non-majors the opportunity to develop their knowledge, understanding and ability in the various aspects of music at a level appropriate to their needs and interests;
- preparing students for careers as performers, composers, scholars, teachers, administrators and other professionals in the field of music;
- broadening and deepening the knowledge and understanding of music through research, teaching, creative activities and publication; and
- enriching the lives of students and faculty as well as the community, state, nation and the world with performances of a wide variety of music presentations and publications.

The College of Music is an academic community committed to maintaining a climate of mutual respect and collegiality.

The widely varied functions of music in the world today present many challenging and interesting opportunities for teachers, performers, creative artists, technicians and commercial personnel. While these different pursuits require specialized emphases, the faculty of the College of Music recognize the musical and educational experiences that are common to all. Therefore, each curriculum of the College of Music is designed to present music as an integrated whole. Solo performance and technique, ensemble performance, historical and theoretical studies, concert and recital opportunities and elective courses both inside and outside the college are intended to give students a balanced approach to musical understanding and musicianship.

The college maintains a ratio of approximately one tenure-track faculty member for every 10 students. This enables students to benefit from dynamic, personal interaction with their professors. The college also offers students regular academic advising to ensure that they complete their degrees without unnecessary delay.

In addition to training in the various professions of music, the college provides general music studies and activities for the non-major; broad cultural programs (concerts, recitals, lectures) for the university and Boulder communities; favorable conditions for research in music; and service activities to the state and nation.

The Bachelor of Arts in Music, Bachelor of Music and Bachelor of Music Education degrees are granted by the university, upon recommendation of the faculty of the College of Music, to those who have successfully completed prescribed requirements.

Students must complete an online graduation application and schedule a final checkout appointment by December 15 for May/August graduation and by October 1 for December graduation.

The Entrepreneurship Center for Music is a national leader in professional development for musicians. The ECM equips today's music students with the skills and tools they need to create sustainable careers in the arts. ECM students are encouraged to develop entrepreneurial skills to explore the vast opportunities inherent in a changing marketplace, and to develop plans to implement career-enhancing ventures across the artistic spectrum. Offerings include courses for credit, an undergraduate certificate in music entrepreneurship, workshops and internships with a wide range of arts organizations and businesses nationwide.

The College of Music has several beautiful performance halls, including the 2,000-seat Macky Auditorium, the 500-seat Grusin Music Hall, the 270-seat Music Theatre and the 120-seat Chamber Hall. The college is located primarily in the Warner Imig Music Building, a large complex of practice rooms, faculty studios, offices, ensemble rehearsal areas,

seminar facilities and classrooms. An addition to the east side of the building features a 4,300 square foot rehearsal space with a 35-foot ceiling and acoustical draping. Additional rehearsal and classroom facilities are located in Macky.

The college's outstanding Howard B. Waltz Music Library is considered to be among the nation's most comprehensive. The library contains over 150,000 volumes, scores, recordings and periodicals. Computerized facilities are provided for listening to recordings and work stations are available for computer-based reference searching.

The college also features extensive facilities for music technology and electronic music study. The Computer-Assisted Music Laboratories (I and II) are multi-purpose labs designed primarily for classroom instruction. They feature numerous workstations, each with a Musical Instrument Digital Interface, sampling keyboard and a computer. The CRUNCH Lab is a fully-featured electronic music project studio. This lab is optimized for computer music research (including live interactive performance systems), as well as sound recording and editing projects and audio/video production. The Class Piano Laboratory is equipped with 12 digital pianos.

Each year the College of Music presents over 400 concerts by students, faculty and guests. In addition to individual musical pursuits, students at all levels have the opportunity to perform in a variety of outstanding ensembles including orchestras, choirs, bands, world music ensembles, chamber and early music groups, jazz ensembles and combos, opera productions and musicals. Many of these groups have been invited to perform at prestigious national and international events. Recitals by students and faculty are supplemented by visits from world-class guest artists, all of which provide the Boulder community with the chance to hear some of the finest music being performed today. The vast majority of these excellent performances are free and open to the public.

Other music programs presented by CU Presents include:

- Artist Series
- Eklund Opera Program
- Takács Quartet Series
- Holiday Festival

For a schedule of all College of Music performances, visit the college's Events (<http://www.colorado.edu/music/events>) webpage.

Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

The student body of the College of Music has its own government, represented by the College of Music Student Government and the Graduate Music Student Council. Honorary music fraternities are Sigma Alpha Iota, Mu Phi Epsilon and Kappa Kappa Psi. Pi Kappa Lambda, a national music honor society, and the Music Teachers National Association both have active chapters within the College of Music. Music education majors are eligible for membership in student chapters of the National Association for Music Educators, the American Choral Directors Association and the American String Teachers Association. Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

Major Fields & Degrees

Undergraduate degrees include the bachelor of music (BM), the bachelor of arts in music (BA) and the bachelor of music education (BME). Students may also elect to earn a certificate in jazz studies, music

technology or music entrepreneurship in conjunction with their degree. In addition to a substantial core of studies in music, the BA in music program allows a wide choice of study in areas outside of music. BM areas of concentration include: composition, musicology, performance and jazz studies. The major emphasis areas in the BME program are: choral, choral-general, instrumental and instrumental-general.

Incoming freshmen and transfer students in the College of Music are declared as music majors at the beginning of their first semester. There is no minor in music.

Students may pursue double degrees in music and an outside field such as engineering, business, etc. Questions may be directed to the associate dean for undergraduate studies, College of Music, 303-492-8468, or ugradmus@colorado.edu.

Policies & Requirements

Honors at Graduation

Students achieving a cumulative GPA of 3.70–3.79 graduate with honors, 3.80–3.89 with high honors and 3.90–4.00 with highest honors. These students are recognized at commencement.

Scholarships and Awards

A number of scholarships and awards are designed specifically for students in the College of Music. Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory degree progress by:

1. demonstrating adequate performance in weekly applied lessons, ensemble and scholarship auditions, applied proficiencies/juries, and recitals/previews,
2. maintaining at least a 3.0 cumulative grade point average in those classes that count toward the music degree and
3. successfully completing at least two-thirds of the credit hours attempted while a music major at CU Boulder.

Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery or falsification of official records, and similar acts or the attempt to engage in such acts are grounds for suspension or expulsion from the university.

In particular, students are advised that plagiarism consists of any act involving the offering of the work of someone else as their own. It is recommended that students consult with their instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses. Students are expected to be acquainted with and abide by provisions of the CU Boulder Honor Code (see the Academic Integrity (p. 15) section).

Scholastic Requirements

To remain in good academic standing, a student must maintain at least a 2.00 cumulative grade point average (GPA) and make satisfactory progress toward the degree as defined by the College of Music and area faculty.

First semester freshmen or transfer students are given a grace semester and will be placed on academic alert if the cumulative GPA is below

2.00. After the second semester, if the semester GPA is above 2.00 but the cumulative is below 2.00 then the student is placed on academic recovery. If the second semester and cumulative GPAs remain below 2.00 then the student is placed on academic suspension.

Academic probation is an official notification that a student's grades are unsatisfactory. Any undergraduate student who has a cumulative or semester grade point average below 2.00 is automatically placed on academic probation for the following three semesters. (Cumulative GPA is calculated on grades earned at this university). Students placed on academic probation will be limited to one ensemble and 15 credit hours. If a probationary student's GPA (semester and/or cumulative) at the end of any probationary semester is not 2.00 or above it will result in automatic suspension. Any undergraduate student who has a cumulative or semester GPA below 1.00 is automatically suspended without a probationary period.

While on suspension, students may not register for regular day classes during the fall or spring semester on any CU campus and are not considered eligible for graduation. To regain good academic standing, suspended students must earn a semester GPA of 2.00 or higher and raise their cumulative GPA to 2.00 or above during the following term by successfully completing at least 12 credit hours (with no withdrawals, no incomplete grades, and no courses taken pass/fail) through the Division of Continuing Education and Professional Studies or summer session.

Courses taken at other campuses or institutions will not be used for purposes of reinstatement, but credits earned may be transferred according to normal procedures and policies after reinstatement and readmission. Suspended students who raise their cumulative GPA to 2.00 or above may then petition for readmission and receive a personal hearing before the associate dean. Suspended students who do not raise their cumulative GPA to 2.00 or above are dismissed from the college and university. Students who have been dismissed must reapply for admission to the university after being reinstated by the college.

Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory progress in their major (as determined by the faculty), demonstrate satisfactory proficiency in jury exams and auditions, enroll in ensemble and maintain a minimum cumulative GPA of 3.00. Students who have a cumulative GPA below 3.00 will be placed on scholarship probation for a maximum of two semesters (consecutive or cumulative), provided the GPA improves each semester. Students on scholarship probation who do not earn a cumulative GPA of 3.00 or higher by the end of the probationary period will have their scholarships revoked.

Appeals

Students have the right to appeal decisions of academic dishonesty and to petition for exceptions to the academic policies stated in this catalog. Appeals should be directed to the Associate Dean for Undergraduate Studies. College of Music policies are in addition to the campus policies.

Admission Requirements

In addition to the entrance requirements of the university outlined in Undergraduate Admission in the General Information section, freshman and transfer students must meet College of Music entrance requirements. Successful College of Music applicants have extensive prior experience in music (including private study), the ability to read and sight-read music notation, an understanding of music fundamentals or basic music theory and elementary piano skills. Students with appropriate skill in piano sight reading and keyboard harmony may be

able to test out of all or part of the keyboard musicianship requirement included in their degree plan. Students with an AP Music Theory test score of 4 are credited with one semester of music theory and aural skills, and those with a test score of 5 are credited with two semesters.

Auditions

An audition is required for all prospective undergraduate music majors. Undergraduate auditions are held in Boulder on selected Saturdays in February. Alternate audition dates may also be scheduled if necessary. If travel distance is prohibitive, prospective students may substitute a high-quality recording. Applicants should identify themselves by name and list selections and titles at the beginning of the recording. In order for students to be fully considered for financial assistance, live auditions should be completed during the general audition weekends in February or recordings should be received by Feb. 15. Students should prepare a 10–20 minute audition program in accordance with the audition requirements listed on the college's Auditions (<http://www.colorado.edu/music/admissions/prospective-undergraduates/auditions>) webpage.

Contact the undergraduate office at 303-492-8468 or ugradmus@colorado.edu for more information.

Admissions decisions for music composition applicants are based on a review of scores and sound recordings for at least three contrasting works. If the portfolio of scores and recordings is considered acceptable for admission to the music composition program, applicants are then invited to schedule an instrumental/voice audition.

Admissions decisions for music education applicants are based on academic qualifications, audition results and an interview conducted by two or more music education faculty members. Interviews address written and verbal communication skills, motivation and goals related to music teaching, prior music teaching experiences and affective characteristics associated with effective music teachers. For more information about music education interviews, visit the college's Music Education (<http://www.colorado.edu/music/departments/music-education>) webpage and contact the music education chair.

Transfer Students

Transfer students from within the university and from other universities must meet the general requirements of the university and the specific requirements of the College of Music, including the audition. A minimum GPA of 2.0 for students transferring from within the university and 2.75 for students transferring from other universities is required. See the undergraduate Admissions (p. 97) section for specific requirements.

Attendance Requirements

Successful work in the College of Music is dependent on regular attendance in all classes. At the beginning of each semester, instructors will inform students of policies governing grading and attendance in each class. Students are expected to attend classes and comply with the attendance requirements specified by their instructors. For ensembles and other performance classes, attendance at dress rehearsals, major concerts and other approved/sanctioned performances, as listed in the course syllabus, also is required.

New Student Convocation

New Student Convocation is an extension of the CU Boulder campus and College of Music orientation programming. Convocation sessions are designed to provide new undergraduate music majors with the knowledge and skills necessary to be successful in making progress toward a music degree. Freshman music majors are required to attend all 10 convocation

sessions. Transfer student attendance is not required, but individuals are strongly encouraged to attend and participate in any convocation sessions that may be particularly interesting or relevant to their future success.

Ensembles

All undergraduate students enrolled in applied music must participate in a university ensemble appropriate to and required by their degree program. (Students enrolled in conducting courses must concurrently be enrolled in a conducted ensemble.) Voice performance majors are not required to be in ensembles during the semester of their senior recital, and bachelor of music education students are exempt from ensemble participation during the student teaching semester. Any student who studies applied music beyond degree requirements must participate concurrently in a university ensemble. Double majors need be in only one ensemble at a time.

Sophomore Proficiency

Students must pass a variety of jury tests and proficiency exams during their degree work. Each applied area has different requirements, so students need to consult the chair of their area and/or studio professor. However, all students must pass a sophomore proficiency exam. Students who cannot pass this exam receive an incomplete grade and cannot progress to the junior level of applied study until the proficiency is achieved. Studio professors provide students with proficiency and repertoire requirements.

Course Load

The normal academic load for an undergraduate student in the College of Music is 15–17 credit hours. Schedules of fewer than 12 or more than 19 credit hours must have approval of the associate dean for undergraduate studies of the College of Music.

Dropping a Course

Students should adhere to the deadlines posted on the Office of the Registrar website for dropping a course each semester. After a certain date each semester, a special action form signed by the instructor and associate dean for undergraduate studies is required to drop a course.

Pass/Fail Option

The pass/fail option for 12 credit hours is open only to Bachelor of Music and Bachelor of Arts in Music students. Music education students may only use the pass/fail option for student teaching. Pass/fail credit hours are to be selected from nonmusic courses and are in addition to those that may be taken in honors. Courses so elected are taken according to the pass/fail policies of the college or school concerned.

Pass/fail credit hours that transfer students can apply toward degree requirements from departments within the university are limited to 1 in every 8 credit hours earned in the College of Music.

Residence Requirement

Of the credit hours required for an undergraduate degree, the last 56 credit hours must be completed in residence in the College of Music. This may be reduced by the associate dean for undergraduate studies for excellent work done in this university and for high scholarship exhibited at previous institutions attended. In no case shall the minimum be fewer than 40 credit hours distributed over three semesters. At least 9 credit hours in applied music (private instruction) must be earned in this college

for the degrees bachelor of music and bachelor of music education, and 6 credit hours for the bachelor of arts in music.

Student Work

Any recital required for graduation is recorded. Arrangements are to be made through the College of Music Operations Office, and a recording fee is charged. The original recording is placed in the Music Library.

Programs of Study

Music

Undergraduate degrees include the Bachelor of Music (BMus) and the Bachelor of Arts in music (BAMus). Students may also elect to earn a certificate in jazz studies, music entrepreneurship or music technology in conjunction with their degree.

In addition to a substantial core of studies in music, the BAMus in music program allows a wide choice of study in areas outside of music.

BMus areas of concentration include: composition, musicology, performance and jazz studies.

Bachelor's Degrees

- Music - Bachelor of Music (BMus) (p. 817)
- Music - Bachelor of Arts in Music (BAMus) (p. 832)

Certificates

- Jazz Studies - Certificate (p. 834)
- Music Entrepreneurship - Certificate (p. 834)
- Music Technology - Certificate (p. 835)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaholm, Philip
Professor Emeritus

Austin, James R (https://experts.colorado.edu/display/fisid_103455)
Professor; PhD, University of Iowa

Bernstein, Giora
Professor Emeritus

Bird-Arvidsson, Jennifer (https://experts.colorado.edu/display/fisid_147651)
Associate Professor; MM, University of Michigan Ann Arbor

Brody, James M (https://experts.colorado.edu/display/fisid_101948)
Associate Professor; MM, Indiana University Bloomington

Bruns, Steven M (https://experts.colorado.edu/display/fisid_103483)
Associate Professor; PhD, University of Wisconsin-Madison

Caballero, Carlo (https://experts.colorado.edu/display/fisid_111681)
Associate Professor; PhD, University of Pennsylvania

Carthy, Nicholas R. (https://experts.colorado.edu/display/fisid_135356)
Associate Professor/Instructor; BA, Guildhall School of Music, London (England)

Chang, Philip C (https://experts.colorado.edu/display/fisid_143541)
Senior Instructor; MA, University of Rochester

Chellis, Matthew Wren (https://experts.colorado.edu/display/fisid_154415)
Assistant Professor; MM, Manhattan School of Music

Conlon, Joan Catoni
Professor Emeritus

Cooper, Peter W. (https://experts.colorado.edu/display/fisid_134522)
Senior Instructor

Cooperstock, Andrew B (https://experts.colorado.edu/display/fisid_115393)
Professor; DMA, Peabody Institute of Johns Hopkins University

Cremaschi, Alejandro M. (https://experts.colorado.edu/display/fisid_134168)
Associate Professor; DMA, University of Minnesota Twin Cities

Davis, John S (https://experts.colorado.edu/display/fisid_115443)
Professor; DMA, University of Northern Colorado

Dockendorf, Matthew Paul (https://experts.colorado.edu/display/fisid_154511)
Instructor; MM, Ohio State University

Drumheller, John E (https://experts.colorado.edu/display/fisid_103707)
Senior Instructor; DMA, University of Colorado Boulder

Dunn, James M (https://experts.colorado.edu/display/fisid_140593)
Associate Professor; DMus, Arizona State University

Dusinberre, Edward (https://experts.colorado.edu/display/fisid_101358)
Assoc Professor Attendant Rank Artist in Residence

Eakin, Charles
Professor Emeritus

Eckert, Erika L (https://experts.colorado.edu/display/fisid_101844)
Associate Professor; BM, University of Rochester

Eddy, Marjorie Alexandra (https://experts.colorado.edu/display/fisid_111634)
Lecturer

Ellsworth, Oliver
Professor Emeritus

Erhard, Paul M (https://experts.colorado.edu/display/fisid_100493)
Professor; DMA, The Juilliard School

Farr, Elizabeth G (https://experts.colorado.edu/display/fisid_101732)
Professor; DMA, University of Michigan Ann Arbor

Fejer, Andras (https://experts.colorado.edu/display/fisid_103923)
Artist in Residence

Fink, Robert
Professor Emeritus

Galm, John
Professor Emeritus

Gentry, Gregory R (https://experts.colorado.edu/display/fisid_151707)
Associate Professor; DMA, University of Missouri-Kansas City

Gonzalez, Luis
Professor Emeritus

Goode, Bradley M. (https://experts.colorado.edu/display/fisid_134686)
Associate Professor/Instructor; MM, DePaul University

Graham, Larry
Professor Emeritus

Gunther, John G (https://experts.colorado.edu/display/fisid_141165)
Associate Professor; PhD, New York University

Hata, Kuniaki
Professor Emeritus

Hayes, Deborah
Professor Emeritus

Hayghe, Jennifer C (https://experts.colorado.edu/display/fisid_155969)
Associate Professor; DMA, The Juilliard School

Holman-Johnson, Leigh (https://experts.colorado.edu/display/fisid_141980)
Associate Professor; DMA, University of Colorado Boulder

Ishikawa, Yoshiyuki (https://experts.colorado.edu/display/fisid_102125)
Professor; DMA, University of Michigan Ann Arbor

Jackson, Dennis
Professor Emeritus

Jennings, Christina A (https://experts.colorado.edu/display/fisid_143545)
Associate Professor; MM, The Juilliard School

Kearns, William
Professor Emeritus

Keister, Jay (https://experts.colorado.edu/display/fisid_115734)
Associate Professor; PhD, University of California-Los Angeles

Kellogg, Daniel Dixon (https://experts.colorado.edu/display/fisid_141124)
Associate Professor; DMA, Yale University

Kim, Suyeon (https://experts.colorado.edu/display/fisid_153470)
Lecturer/Instructor

Korevaar, David J (https://experts.colorado.edu/display/fisid_118374)
Professor; DMA, The Juilliard School

Lehnert, Doris Pridonoff
Professor Emeritus

Lehnert, Oswald
Professor Emeritus

Leong, Daphne (https://experts.colorado.edu/display/fisid_115747)
Associate Professor; PhD, University of Rochester

Lewis, Gary J (https://experts.colorado.edu/display/fisid_145854)
Professor/Instructor; MM, Texas Tech University

Lin, Hsiao-Ling (https://experts.colorado.edu/display/fisid_149958)
Instructor; MM, DePaul University

Malin, Jonathan (https://experts.colorado.edu/display/fisid_151714)
Associate Professor; PhD, University of Chicago

Maloy, Rebecca (https://experts.colorado.edu/display/fisid_125582)
Professor/Associate Professor; PhD, University of Cincinnati

Mason, Patrick C (https://experts.colorado.edu/display/fisid_101840)
Professor; MM, University of Nebraska-Lincoln

McCarthy, Kevin
Professor Emeritus

McDonald, Margaret M (https://experts.colorado.edu/display/fisid_134703)
Associate Professor; DMA, University of California-Santa Barbara

McKee, Paul (https://experts.colorado.edu/display/fisid_154465)
Associate Professor; MM, University of Texas at Austin

McKinney, Donald J (https://experts.colorado.edu/display/fisid_152974)
Associate Professor; DMA, University of Michigan Ann Arbor

Moteki, Mutsumi (https://experts.colorado.edu/display/fisid_100992)
Professor; DMA, University of Michigan Ann Arbor

Myer, Tom R (https://experts.colorado.edu/display/fisid_100922)
Associate Professor; MM, East Texas State University

Nguyen, Alexandra (https://experts.colorado.edu/display/fisid_145847)
Associate Professor; DMA, University of Rochester

Nims, Abigail Andrews (https://experts.colorado.edu/display/fisid_152977)
Assistant Professor; MM, Westminster Choir College

Nytch, Jeffrey C. (https://experts.colorado.edu/display/fisid_147341)
Associate Professor; DMA, Rice University

Okigbo, Austin Chinagorom (https://experts.colorado.edu/display/fisid_151507)
Assistant Professor; PhD, Indiana University Bloomington

Pann, Carter N (https://experts.colorado.edu/display/fisid_141461)
Associate Professor; DMA, University of Michigan Ann Arbor

Peterson, Patti H (https://experts.colorado.edu/display/fisid_101502)
Associate Professor; DMA, University of Colorado Boulder

Pinkow, David
Professor Emeritus

Ramsey, Andrea L (https://experts.colorado.edu/display/fisid_154420)
Assistant Professor; PhD, Michigan State University

Reger, Jeremy J (https://experts.colorado.edu/display/fisid_156224)
Instructor; DMA, University of Michigan Ann Arbor

Require, David (https://experts.colorado.edu/display/fisid_155785)
Associate Professor/Assistant Professor; MM, University of Michigan Ann Arbor

Rhodes, Harumi B (https://experts.colorado.edu/display/fisid_155971)
Associate ProfessorAssistant Professor; Not Listed, New England Conservatory of Music

Riis, Thomas L (https://experts.colorado.edu/display/fisid_100723)
Professor; PhD, University of Michigan Ann Arbor

Roeder, Matthew J (https://experts.colorado.edu/display/fisid_120180)
Associate Professor; DMA, University of Colorado Boulder

Romero, Brenda M (https://experts.colorado.edu/display/fisid_106117)
Associate Professor; PhD, University of California-Los Angeles

Sable, Barbara Kinsey
Professor Emeritus

Sampsel, Laurie (https://experts.colorado.edu/display/fisid_101802)
Professor; MLS, Kent State University

Sawchuk, Terry M (https://experts.colorado.edu/display/fisid_102477)
Associate Professor; MM, University of Michigan Ann Arbor

Schranz, Karoly (https://experts.colorado.edu/display/fisid_103924)
Assoc Professor Attendant RankArtist in Residence

Scott, F. Wayne
Professor Emeritus

Shay, Robert S. (https://experts.colorado.edu/display/fisid_154671)
Professor; PhD, University of North Carolina Chapel Hill

Silver, Daniel S (https://experts.colorado.edu/display/fisid_115564)
Associate Professor; MM, University of Michigan Ann Arbor

Smith, Jeremy L (https://experts.colorado.edu/display/fisid_118265)
ProfessorAssociate Professor; PhD, University of California-Santa Barbara

Spera, Nicolo Ruggero Ferruccio (https://experts.colorado.edu/display/fisid_148406)
Assistant Professor; DMA, University of Colorado Boulder

Spillman, Robert
Professor Emeritus

Stanley, William J (https://experts.colorado.edu/display/fisid_103616)
Associate Professor; DMA, University of Illinois at Urbana-Champaign

Swadener, Marc
Professor Emeritus

Teitelbaum, Benjamin Raphael (https://experts.colorado.edu/display/fisid_151338)
Assistant Professor; PhD, Brown University

Theodore, Michael (https://experts.colorado.edu/display/fisid_113318)
Associate Professor; PhD, University of California-San Diego

Thornton, Michael Robert (https://experts.colorado.edu/display/fisid_116318)
Associate Professor; BM, Temple University

Walter, Douglas W (https://experts.colorado.edu/display/fisid_101811)
Professor; DMA, Temple University

Walther, Geraldine E (https://experts.colorado.edu/display/fisid_142000)
Artist in Residence

Waters, Keith John (https://experts.colorado.edu/display/fisid_107518)
Professor; PhD, University of Rochester

Wetherbee, Charles Tyler (https://experts.colorado.edu/display/fisid_151515)
Assistant Professor; BM, Curtis Institute of Music

Wolzien, Charles
Professor Emeritus

Courses

MUSC 1081 (3) Intensive Music Theory

Introduces diatonic harmony and voice leading with intensive work on fundamentals (keys, intervals, triads, seventh chords and four-voice writing). The study of theoretical concepts is closely coordinated with aural skills. Feeds into the intensive section of MUSC 1111. Offered fall only.

Requisites: Requires corequisite course of MUSC 1121. Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1101 (2) Semester 1 Theory

Introduces the fundamentals of diatonic harmony and voice leading, focusing on model composition (including one-, two- and four-voice writing) and analysis of excerpts from music literature. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1103 (1) Becoming a Music Teacher

Provides an introduction to basic principles and practices of the music education profession. Explores contexts and methods of public school music teaching through class discussions, practice teaching and directed observations. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Letter Grade

MUSC 1111 (2) Semester 2 Theory

Continuation of MUSC 1101. Explores principles of harmony, voice leading and form. Continues emphasis on both model composition and analysis. Introduces chromatic elements (such as applied dominants and modulation), harmonic syntax and structural analysis of excerpts from music literature. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1101 or MUSC 1081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1121 (1) Aural Skills Lab, Semester 1

Focuses on sight singing, rhythm and dictation of diatonic melodies in major and minor keys (treble, alto and bass clefs). Covers identification of scale types, intervals, triads and dominant seventh chords. Includes individual and group improvisation. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1131 (1) Aural Skills Lab, Semester 2

Continuation of MUSC 1121. Focuses on sight singing, rhythm and dictation of diatonic melodies; adds chromatic elements, more complex rhythms and two-part dictation. Includes harmonic dictation using vocabulary from MUSC 1111. Includes individual and group improvisation within harmonic contexts. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1121 (minimum grade D-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1325 (1) Piano Sight Reading

Studies techniques for improving sight-reading skills at the keyboard, with practical work in solo, ensemble and choral literature. Also covers score reading and transposition. Restricted to piano majors or instructor consent required. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 1326 (1) Guitar Musicianship

Activities in sight-reading, fretboard harmony and comprehension of harmony and texture. Some work will be tied to the repertoire being studied in studio lessons. Open only to students with an emphasis on guitar performance in their degree plan.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 1544 (1) Italian Diction

Designed for the understanding of lyric Italian diction, the international phonetic alphabet, and its application to classical singing. Required for freshmen BM voice majors. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 1554 (1) English Diction

Designed for the understanding of lyric English diction, the international phonetic alphabet, and its application to classical singing as well as various musical styles of English classical voice literature. Required for Freshmen BM voice majors.

Requisites: Requires prerequisite course of MUSC 1544 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 1802 (3) Introduction to Musical Styles and Ideas

Introduces the study of musical traditions of the world; equips students with requisite skills for understanding and analyzing music as an art in historical and cultural contexts using an integrative approach that includes selected styles and genres, critical reading and writing skills and mastery of conceptual issues related to the discipline of music. Satisfies the World Music requirement for undergraduate students in the College of Music.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2071 (2) Instrumentation

Introduces the instruments in the orchestra by studying their ranges, idioms, histories and performance practices. Assignments center around hands-on scoring for instruments. Student arrangements will be performed in class during the semester. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 2101 and MUSC 2121 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2081 (2) Prepared for the Soundcheck

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering. Uses recorded material from in-class sessions. Examines differing approaches to recording as well as current technologies.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 2860

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2091 (2) Recording Techniques

Provides hands-on training in various audio recording techniques, acoustics and sound reinforcement, studio maintenance and troubleshooting. Real-world experience is gained through individual recording projects and College of Music events.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 2870

Requisites: Requires prerequisite course of MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2101 (2) Semester 3 Theory

Continuation of MUSC 1111. Reviews harmonic and formal concepts from MUSC 1111. Introduces advanced chromatic concepts such as modal mixture, seventh chords with added dissonance, Neapolitan sixth chord and augmented-sixth chords. Explores in-depth structural analysis of musical works. Offered fall only.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2103 (3) Introduction to Music Education

Provides an overview of basic principles and practices of the music education profession. Explores public school music teaching through class discussions, directed observations, and a supervised field experience. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 2111 (2) Semester 4 Theory

Continuation of MUSC 2101. Builds on and synthesizes harmonic, melodic and formal concepts from semesters 1-3. Includes writing about musical structure and analyzing relationships of musical structure to extramusical elements (such as text, performance technique, dance, staging, etc.). Introduces 20th century compositional techniques. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2101 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2121 (1) Aural Skills Lab, Semester 3

Continuation of MUSC 1131. Applies concepts from MUSC 2101 in performance (prepared, from sight and improvised) and analytical listening (transcription, diction and aural analysis). Offered fall only.

Requisites: Requires prerequisite course of MUSC 1131 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2131 (1) Aural Skills Lab, Semester 4

Continuation of MUSC 2121. Applies concepts from MUSC 2111 in performance (prepared, from sight and improvised) and analytical listening (transcription, dictation and aural analysis). Offered spring only.

Requisites: Requires prerequisite course of MUSC 2121 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2325 (2) Applied Harmony for the Keyboard

Provides an intensive study and application of the harmonic structure of music in a variety of keyboard skills: figured bass realization, chord progressions, harmonization, improvisation, transposition, on-sight harmonic analysis and playing by ear. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 1325 (all minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 2365 (2) Introduction to Accompanying

An overall study in the art of working with instrumentalists and singers including repertoire and orchestral reductions. Requires performance with a student instrumentalist or singer to be critiqued and coached by class and instructor. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1325 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 2366 (2) Guitar Accompanying

Survey of accompanying repertoire for guitar with solo instruments (flute, violin, voice, etc.), including introductory work in basso continuo, playing/improvising from chord charts, and arranging accompaniments from musical scores.

Requisites: Requires prerequisite course of MUSC 1326 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 2608 (1) Alexander Technique

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5608

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 2772 (3) World Musics: Asia and Oceania

Highlights music in Asia and Oceania using current ethnomusicological materials.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2782 (3) World Musics: Africa, Europe, and the Americas

Use current ethnomusicological materials and methods in the study of music outside the Western art tradition. Usually taught in the spring, focuses on music cultures of Africa, Europe and the Americas.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2918 (2) Building Your Music Career

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5918

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 2988 (1) Introduction to Music Research

Introduces music research tools and basic writing skills to provide information fluency and skills necessary for successful composition of formal music research papers. Applies curricular goals to specific topics of students' choice.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 2997 (1) Sophomore Proficiency

To be completed by the second semester of the sophomore year.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Theses and Recitals

MUSC 3013 (1) String Class

For music education majors with choral/general emphasis. Develops basic performance skills on two or more string instruments. Addresses teaching strategies and other specialized topics related to string instruction. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3023 (1) Woodwind Class

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3033 (1) Brass Class

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3051 (2) Beginning Composition

Covers issues relating to the craft of musical composition with analysis and writing in various styles. This introductory course is designed for music majors who are not composition majors. Some of the assignments will be read in class. Offered spring term of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3061 (2) Jazz Improvisation I

Develops skills in jazz improvisation through practical application of harmonic concepts, melodic construction, rhythmic awareness, transcription, repertoire and analysis. Open to all instruments. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite for non-jazz majors MUSC 2111.

Additional Information: Departmental Category: Theory and Composition

MUSC 3071 (2) Jazz Improvisation II

Continues and expands upon the material presented in MUSC 3061. Reinforcement of ability to create an improvised melody in a range of harmonic contexts including blues, bebop, modal jazz, free jazz, and other styles. Offered spring only.

Requisites: Requires prerequisite course of MUSC 3061 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3081 (3) Jazz Theory and Aural Foundations 1

Presents the grammar and syntax of jazz. Helps to gain a greater understanding of the inner workings and application of chord progressions as they relate to the jazz idiom including major key harmony, secondary dominants, modal interchange and modulation. Students will demonstrate their understanding of these components through written assignments, singing, aural recognition, transcription and keyboard demonstration.

Requisites: Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 3071 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3133 (2) Teaching General Music I

Provides an overview of general music teaching with emphasis on developmentally appropriate strategies and materials. Required for all music education majors as partial fulfillment of course work leading to K-12 music licensure. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3153 (2) Teaching Woodwind Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3163 (2) Teaching String Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more string instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate string instruction. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3176 (2) Conducting I

Introduces conducting and rehearsal techniques. Performance participation in the appropriate ensemble (band, choir or orchestra). Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 3186 (2) Conducting II

Introduces conducting and rehearsal techniques. Department enforced corequisite: performance participation in the appropriate ensemble (band, choir, or orchestra). Offered spring only.

Requisites: Requires prerequisite course of MUSC 3176 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 3193 (2) Vocal Pedagogy and Literature for Young Voices

Provides an overview of vocal anatomy/function, care of the voice, vocal repertoire, teaching strategies, and other specialized topics related to singing instruction in both private studio and public school choral settings. Fall section for instrumentalists; spring section for vocalists.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3223 (2) Teaching Brass Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3253 (2) Jazz Techniques for the Music Educator

Prepares the music educator for successful experiences teaching jazz at the secondary level. Students gain insights into performance and rehearsal techniques for the instrumental jazz ensemble. Explores approaches for teaching jazz theory, improvisation, and selecting literature for young students. Own instrument required for certain classes. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisites MUSC 1111 and MUSC 2103.

Additional Information: Departmental Category: Music Education

MUSC 3273 (2) String Pedagogy and Literature

Examines instructional methods/materials and pedagogical approaches appropriate for beginning to advanced string students in private studio, small ensemble, or large ensemble contexts. Topics may include group teaching strategies, as well as contemporary approaches including Rolland and Suzuki. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisites MUSC 2103 and MUSC 3163.

Additional Information: Departmental Category: Music Education

MUSC 3345 (2) Piano Pedagogy 1

Discusses teaching philosophies, objectives, and procedures. Examines and evaluates methods and materials. Studies practical aspects with which the private teacher is concerned. Offered fall of even-numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 3355 (2) Piano Pedagogy 2

Materials and techniques for teaching piano with a focus on the intermediate level student. Offered only in spring of odd-numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 3363 (2) Marching Band Techniques

Helps develop the skills needed to administer and teach all aspects of a contemporary high school marching band. Includes drill conception and design, instruction, organization, and administration. Offered fall only.

Requisites: Requires prerequisite course of MUSC 2103 and EMUS 1287 (all minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3444 (1) French Diction

Designed for the understanding of lyric French diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of French classical vocal literature. Required of Junior BM voice majors.

Requisites: Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Recommended: Prerequisite MUSC 3464.

Additional Information: Departmental Category: Voice

MUSC 3464 (1) German Diction

Designed for the understanding of lyric German diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of German classical vocal literature. Required of sophomore BM voice majors.

Requisites: Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 3642 (3) History of Jazz 1

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from its origins up to the 1950's, including the various traditions, practices, historical events and people most important to its evolution. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 3772 (3) West African Music and Culture in Ghana

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 3772

Requisites: Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

Additional Information: Departmental Category: Musicology

MUSC 3802 (3) History of Music 1

Surveys Western art music with stylistic analysis of representative works from all major periods through the Baroque. See also MUSC 3812.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 3812 (3) History of Music 2

Surveys Western art music with stylistic analysis of representative works from all major periods after the Baroque. See also MUSC 3802.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 3997 (1) Junior Recital

To be completed by the second semester of the junior year.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 2997. Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 4001 (2) New Musical Styles and Practices

Explores a variety of music from the 20th and 21st centuries beginning with Stravinsky and moving through current trends. Involves a mix an analysis/exploration of this music with short composition assignments imitating the different styles. Offered spring of odd-numbered years.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5011

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4012 and MUSC 5012

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the style. Offered fall only.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4031 (2) Jazz Arranging 1

Study of notation, score layout, transpositions, basic harmonic and melodic analysis, basic chord voicings, and composition for a small and large jazz ensemble. Use of notation software such as Finale or Sibelius. Offered fall semester only.

Requisites: Requires prerequisite course of MUSC 3091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4041 (2) Orchestration

Studies advanced orchestration techniques through score analysis and student projects. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 2071 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4061 (2) Tonal Analysis

Surveys tonal analytical techniques and forms of tonal music, including binary forms, ternary forms, rondo (and others) through study of selected works. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4071 (2) Post-Tonal Theory and Analysis

Focuses on theory and analysis of post-tonal literature pre-1945. Offered fall of odd-numbered years.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5078

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite piano majors.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 4081 (3) Introduction to Music Technology

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4081 and CMDP 3860

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4091 (2) Jazz Arranging 2

Continuation and expansion of studies in MUSC 4031. Survey and analysis of major composers and arrangers of the idiom. Course focuses on creating several arranging projects for a jazz ensembles. Offered spring of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 4031 (minimum grade D-). Restricted to College of Music undergraduate students only.

Recommended: Prerequisite MUSC 3081.

Additional Information: Departmental Category: Theory and Composition

MUSC 4101 (1-3) Theory and Aural Skills Review

Reviews tonal harmony, voice leading, and essential aural skills. Prepares graduate students for more advanced work in music theory. Students may register for aural skills only (1 credit), theory only (2 credits) or both theory and aural skills (3 credits). May not be taken pass/fail. Aural skills section offered fall and spring. Theory section offered spring.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4103 (1) Introduction to Student Teaching

Represents the first half of the professional internship year. Familiarizes students with the schools and music programs in which they plan to student teach. Music placements may consist of elementary and high school, elementary and middle school, or middle school and high school.

Requisites: Requires a prerequisite course of MUSC 4113 or MUSC 4313 or MUSC 4443 (minimum grade C-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4106 (2) Guitar Literature

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5106

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 4111 (2) Composing at the Computer

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4112 (3) Ethnomusicology

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4113 (3) Teaching General Music 2

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental and speech-based arrangements. Offered fall only.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4121 (3) Topics in Music Technology

Exploration of issues, techniques, and tools of music technology. Topics vary from term to term and may include: interactive systems for performance; teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia, sound design and analysis. Lectures on work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4122 (3) Music in Jewish Culture

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4122

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 4133 (3) Student Teaching Practicum

Offers practice teaching under the guidance of a master music teacher.

Requisites: Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4142 (3) American Indian Music

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5142

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4143 (2) Developing Children's Choirs

Examines the musical skills, teaching techniques and administrative procedures necessary for developing a children's choir. Offered fall term of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5143

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4151 (3) Topics in Music Analysis

Examines critically a specific topic or repertory, such as Song Analysis or Music of Brahms. Uses readings and analyses, with grades to be determined from reading responses, analytical assignments and writing. Offered fall of even-numbered years.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade B).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theory and Composition

MUSC 4152 (3) East Asian Music

Surveys the development of music in Japan, China and Korea through the in-depth study of particular styles of traditional music. The course emphasizes the study of music and culture, particularly music's relationship to religion, politics, language, literature, dance and theatre.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

Departmental Category: Asia Content

MUSC 4153 (1) Percussion Class and Pedagogy

Required of all music education majors. Presents knowledge and skills necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4163 (2) Choral Literature for School Ensembles

Examination of literature, materials, and methods appropriate for teaching choral music in secondary schools. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4168 (3) World Music Theories

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5168

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Recommended: Prerequisite MUSC 1802 or MUSC 2772 or MUSC 2782 or MUSC 4112.

Additional Information: Departmental Category: Theory and Composition

MUSC 4191 (2) Advanced Recording

Study of advanced recording techniques and concepts beyond those covered in MUSC 2091 involving multiple microphones for ensemble concerts and recording sessions within and outside of the College of Music. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 2091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4193 (1) Student Teaching Seminar

Required for all music student teachers. Addresses topics of concern to beginning teachers including classroom management, interpersonal skills, legal issues, job search strategies and capstone project development.

Requisites: Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4202 (3) Special Topic in Musicology: Current and Critical Issues

Examination of a specific topic of current or critical interest within areas of music history, ethnomusicology, critical theory and practice across the spectrum of Western, Popular and World Music traditions. Designed as a capstone course for music majors who have completed a full complement of musicology courses. Topics vary from term to term. Instructor consent is required for non-music majors.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 4203 (1) Music Methods Practicum

Provides students with opportunities to observe and practice the use of various teaching techniques and relate them to concepts presented in the methods course. Students consult with the instructor to determine appropriate placements in schools.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Requires corequisite course of MUSC 4313 or MUSC 4443. Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4255 (2) Service Playing Techniques

Study of church music for liturgical and non-liturgical denominations; includes hymn playing, anthem accompaniments, basics of conducting from the organ console and improvisation and selection of organ music appropriate to the requirements of the church year and other special services.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5255

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4285 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present. See also MUSC 4295.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5285

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4295 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present. See also MUSC 4285.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5295

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4313 (3) Teaching Choral Music

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5313

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 2103.

Additional Information: Departmental Category: Music Education

MUSC 4325 (2) Keyboard Literature 1

Surveys keyboard music from 1600 to 1830. Offered fall semester of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4335 (2) Keyboard Literature 2

Surveys keyboard music from 1830 to the present. Offered spring semester of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4405 (2) Basso-Continuo Accompaniment

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5405

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4443 (3) Teaching Instrumental Music

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5443

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4583 (2) Inclusive Music Classroom

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5583

Requisites: Requires prerequisite courses of MUSC 2103 and MUSC 3133 (all minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 4113.

Additional Information: Departmental Category: Music Education

MUSC 4608 (1) Advanced Studies in the Alexander Technique

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 2608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5808

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 2608 (minimum grade C-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 4666 (3) Chamber Music Lit WW/Prc

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 4712 (3) Renaissance Music

Provides a repertory and analysis of polyphonic music, 1400-1600.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5712

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4752 (3) Women in Music

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5752

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4772 (3) History of Opera

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5772

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 or MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4802 (3) Studies in 20th Century Music

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5802

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4852 (3) 17th and Early 18th Century Music

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5852

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4862 (3) African American Music

Examines the sacred and secular genres of Black American music from folk spirituals to contemporary gospel and hip-hop in their cultural and historical contexts. Examines individual composers and performers in specific historical contexts in order to understand the meanings behind certain Black musical stylistics, sound ideals and aesthetic preferences. Formerly MUSC 2802.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4872 (3) Late 18th and 19th Century Music

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5872

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4892 (3) Latin American Music

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5892

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4908 (1-3) Internship in Music Business

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5908

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4957 (1-4) Senior Thesis

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 4958 (2) Community Performances

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5958

Requisites: Requires prerequisite course of MUSC 2918 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4978 (3) Arts Administration & Management

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5978

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4988 (3) The Entrepreneurial Artist

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5988

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 2918.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4997 (1) Senior Recital

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite class of MUSC 3997 (minimum grade D-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

Music - Bachelor of Music (BMus)

The undergraduate degrees in music emphasize knowledge and awareness of:

- solo performance and technique, including the various musical styles used in compositions for students' musical instruments or voice;
- each composition performed, notation and editorial signs used in the compositions performed, and repertoire for the students' performance medium;
- ensemble performance, including familiarity with major composers in the student's performance medium and the techniques necessary to blend a number of individual musicians into an ensemble;
- concert and recital opportunities, including literature composed for different performance forces;
- theoretical studies, including tonal harmony, counterpoint, voice-leading and notation; formal principles and analytical techniques for

tonal music; and instruments in score, including the concert pitch of transposing instruments and nomenclature used in scores; and

- historical studies, including representative works in the canon of musical literature from chant to the present, the general outlines of the history of music from the Middle Ages to the present, music in the United States and musical cultures other than those of Europe.

In addition, students completing any of the degrees in music are expected to acquire the ability to:

- perform solo and ensemble repertoire demonstrating musical artistry, technical proficiency and stylistic understanding;
- demonstrate an understanding of theoretical studies, including sight-reading and ear training; and
- demonstrate an understanding of historical studies including the analysis of stylistic periods and music of non-Western cultures.

Concentration Areas

The four-year professional curriculum leading to the Bachelor of Music degree emphasizes creative skill, academic achievement and artistic performance in music. Concentration areas are offered in performance, composition, musicology and jazz studies.

Performance Concentration

Performance areas include voice, piano, jazz piano, organ, harpsichord, string instruments, harp, classical guitar, woodwinds, brass and percussion.

Dual Degree Programs

Double Major in Music Performance

Eligible students in the College of Music, with approval of faculty in the relevant areas or departments, may complete a double major in music performance. Normally, such programs take at least five years to complete. Students pursuing a double major in music performance must complete at least 15 additional credit hours beyond the 120 credit hours required for a single performance major. Requirements pertaining to applied study, chamber music, sophomore proficiency, junior recital and senior recital must be fulfilled separately for each degree; up to four credit hours of university ensemble can be applied to both majors when appropriate and with faculty/advisor approval. Students completing all requirements are awarded a single bachelor of music degree with two majors.

The decision to earn more than one degree or major in the College of Music should be carefully weighed, as it may be more advantageous for a student to complete a single degree/major and then begin work on a graduate degree in music.

BMus/BMusEd in Music Performance and Music Education

Qualified music majors who have been approved by the relevant major departments may elect to complete a dual major in music performance (woodwinds, brass and percussion, strings, voice, or jazz emphasis) and music education (instrumental or choral tracks). Requirements for these dual degree program range from 139 to 148 credit hours, and a minimum of 10 semesters of study (including one semester of full-time student teaching) is typically necessary to complete all requirements.

Double Degree in Music and an Outside Major

Students may complete requirements in two fields and receive two degrees from the university. Approximately 20 percent of music majors are studying a second major outside of music.

Requirements

A half recital in the junior year and a full recital in the senior year are required of students in the performance concentration areas, except voice theatre. Students should check with their advisor about preview policies.

A senior thesis is required of students in musicology. Music composition students must complete a senior project, as must voice students with an emphasis in musical theatre (senior recital, major role or direction/design of a major show). Student advisors must approve senior thesis and senior project plans.

Ensemble and chamber music requirements are specified in the degree plan for each concentration as approved by applied area faculty. Exceptions to these requirements must be approved by the major advisor and associate dean in consultation with area chairs and ensemble conductors.

Students pursuing the bachelor of music degree will be required to take one 3-credit-hour course in English composition through the Program for Writing and Rhetoric or the English department. Courses such as First-Year Writing and Rhetoric (WRTG 1150), Freshman Writing Seminar (ENGL 1001) or Introduction to Creative Writing (ENGL 1191) fulfill the requirement. The credit hours are applied in the liberal arts electives category. Students are strongly encouraged to complete this requirement by the end of their freshman year.

Brass Performance Concentration Area

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Chamber Music		2
Ensemble		2
Written communication		3

Non-music electives		6
	Credit Hours	30
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied Instruction	5
Chamber Music		2
Ensemble		2
Music electives		2
Non-music electives		12
Free electives		1
	Credit Hours	31
Year Three		
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 4081	Introduction to Music Technology	3
MUSC 2071	Instrumentation	2
MUSC 3176	Conducting 1	2
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	5
Ensemble		2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Non-music electives		6
Free electives		3
	Credit Hours	32
Year Four		
MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	5
4000-level elective in musicology		3
Ensemble		2
Music electives		7
Non-music electives		3
Free electives		6
	Credit Hours	27
	Total Credit Hours	120

Classical Guitar Performance Concentration Area

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1326	Guitar Musicianship	1
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 2366	Guitar Accompanying	2
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1566	Applied Instruction	8
Written communication		3
Non-music electives		6
	Credit Hours	31
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2566	Applied Instruction	7
Ensemble		2
Music electives		3
Non-music electives		9
Free electives		6
	Credit Hours	34
Year Three		
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1

MUSC 4061	Tonal Analysis	2
MUSC 4106	Guitar Literature	2
PMUS 3566	Applied Instruction	7
Ensemble		2
Non-music electives		6
Free electives		2
	Credit Hours	30
Year Four		
MUSC 4997	Senior Recital	1
PMUS 4566	Applied Instruction	7
Upper-division music theory elective (3000- or 4000-level theory class, except MUSC 4101)		2
4000-level elective in musicology		3
Ensemble		2
Non-music electives		6
Free electives		4
	Credit Hours	25
	Total Credit Hours	120

Composition Concentration Area

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1526	Applied Instruction	6
Written communication		3
Ensemble		2
Keyboard Musicianship or Secondary Applied Instruction		4
Non-music electives		6
	Credit Hours	30
Year Two		
MUSC 2071	Instrumenta	2
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4

MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 4001	New Musical Styles and Practices	2
PMUS 2526	Applied Instruction	5
Keyboard Musicianship or Secondary Applied lessons		4
Ensemble		2
Non-music electives		9
Free electives		2
	Credit Hours	33
Year Three		
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 4041	Orchestration	2
MUSC 4021	18th Century Counterpoint	2
MUSC 4071	Post-Tonal Theory and Analysis	2
PMUS 3526	Applied Instruction	6
Ensemble		2
Non-music electives		6
Free electives		2
	Credit Hours	30
Year Four		
MUSC 4011	16th Century Counterpoint	2
MUSC 4061	Tonal Analysis	2
PMUS 4526	Applied Instruction	5
Senior Project		2
4000-level elective in musicology		3
Ensemble		2
Non-music electives		6
Free electives		5
	Credit Hours	27
	Total Credit Hours	120

Harp Performance Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1576	Applied Instruction	8
Written communication		3
Ensemble		2
Non-music electives		6
	Credit Hours	30
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2105 & PMUS 2205	Keyboard-Musicianship 3 and Keyboard-Musicianship 4	2
PMUS 2576	Applied Instruction	7
Ensemble		2
Music electives		3
Non-music electives		9
Free electives		3
	Credit Hours	33
Year Three		
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6

MUSC 3997	Junior Recital	1
MUSC 3176	Conducting 1	2
MUSC 2071	Instrumentation	2
PMUS 3576	Applied Instruction	7
Chamber Music		1
Ensemble		2
Non-music electives		6
Free electives		4
	Credit Hours	31
Year Four		
MUSC 4997	Senior Recital	1
PMUS 4576	Applied Instruction	7
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
4000-level elective in musicology		3
Chamber Music		2
Ensemble		2
Non-music electives		6
Free electives		3
	Credit Hours	26
	Total Credit Hours	120

Harpsichord Performance Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1586	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music electives		9
Free electives		3
	Credit Hours	32
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4

MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 4405	Basso-Continuo Accompaniment (fall)	2
PMUS 2586	Applied Instruction	5
Ensemble		2
Performance minor		4
Non-music electives		9
Free electives		3
	Credit Hours	32

Year Three		
MUSC 3176	Conducting 1 (fall)	2
MUSC 4011	16th Century Counterpoint	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3586	Applied Instruction	6
Ensemble		2
Non-music electives		6
Music electives (special studies focusing on harpsichord literature and pedagogy recommended)		2
Free electives		3
	Credit Hours	30

Year Four		
MUSC 4061	Tonal Analysis (fall)	2
MUSC 4852	17th and Early 18th Century Music	3
MUSC 4021	18th Century Counterpoint (fall)	2
MUSC 4997	Senior Recital	1
PMUS 4586	Applied Instruction	6
4000-level elective in musicology		3
Ensemble		2
Music electives		3
Non-music electives		3
Free electives		1
	Credit Hours	26
	Total Credit Hours	120

Jazz Piano Performance Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
ETHN 2001	Foundations Race and Ethnicity in the United States	3
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1325	Piano Sight Reading	1
MUSC 2365	Introduction to Accompany	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 3061 & MUSC 3071	Jazz Improvisation I and Jazz Improvisation II	4
PMUS 1806	Applied Instruction	8
Ensemble		1
Written communication		3
	Credit Hours	33
Year Two		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
HIST 2437	African American History	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1

MUSC 3081	Jazz Theory and Aural Foundations 1	3
MUSC 3642	History of Jazz 1	3
PMUS 2806	Applied Instruction	7
Ensemble		1
Non-music electives		3
Free electives		2
	Credit Hours	31
Year Three		
EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4031	Jazz Arranging 1	2
MUSC 4091	Jazz Arranging 2	2
PMUS 3806	Applied Instruction	5
Non-music electives		12
	Credit Hours	30
Year Four		
EMUS 3427 & EMUS 3437	Jazz Ensemble and Jazz Combo	3
MUSC 4997	Senior Recital	1
PMUS 4806	Applied Instruction	5
Non-music electives		6
Free electives		6
Music electives		2
4000-level elective in musicology		3
	Credit Hours	26
	Total Credit Hours	120

Jazz Studies Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
ETHN 2001	Foundations Race and Ethnicity in the United States	3

MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 3061 & MUSC 3071	Jazz Improvisation I and Jazz Improvisation II	4
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	8
Ensemble		1
Written communication		3
	Credit Hours	32
Year Two		
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	2
HIST 2437	African American History	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3081	Jazz Theory and Aural Foundations 1	3
MUSC 3642	History of Jazz 1	3
PMUS 1515	Jazz Piano Class	2
PMUS 2XXX	Applied Instruction	7
Ensemble		1
Non-music electives		3
	Credit Hours	31

Year Three

EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 4031 & MUSC 4091	Jazz Arranging 1 and Jazz Arranging 2	4
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	5
Non-music electives		12
Free electives		2
	Credit Hours	32

Year Four

EMUS 3427 & EMUS 3437	Jazz Ensemble and Jazz Combo	3
MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	5
4000-level elective in musicology		3
Music electives		2
Non-music electives		6
Free electives		5
	Credit Hours	25
	Total Credit Hours	120

Musicology Concentration Area

In addition to the requirements applying to all bachelor of music curricula, a second-year proficiency is required in one foreign language.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
HIST 1011	Greeks, Romans, Kings & Crusaders: European History to 1600	3
HIST 1012	Empire, Revolution and Global War: European History Since 1600	3
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4

MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied instruction	4
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		6
Free electives		3
	Credit Hours	32

Year Two

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2988	Introduction to Music Research	1
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied instruction	4
Ensemble		2
Music electives		5
Non-music electives		6
Free electives		6
	Credit Hours	31

Year Three

MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 4061	Tonal Analysis	2
PMUS 3XXX	Applied instruction	4
Ensemble		2
4000-level electives in musicology (two non-Western)		6
Non-music electives		6
Free electives		3
	Credit Hours	31

Year Four

MUSC 4011	16th Century Counterpoint	2
MUSC 4021 or MUSC 4081	18th Century Counterpoint or Introduction to Music Technology	2
MUSC 4957	Senior Thesis	4
MUSC 4071	Post-Tonal Theory and Analysis	2
TMUS 4403	Special Studies Music History	2
4000-level electives in musicology (two non-Western)		6
Non-music electives		6
Free electives		2
	Credit Hours	26
	Total Credit Hours	120

Organ Performance Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1616	Applied Instruction	8
Ensemble		2
Performance minor		2
Written communication		3
Non-music electives		3
Free electives		3
	Credit Hours	30

Year Two

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
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MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2616	Applied Instruction	7
Service Playing Techniques Ensemble		2
Performance minor		2
Non-music electives		6
Free electives		4
	Credit Hours	30
Year Three		
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4021	18th Century Counterpoint	2
MUSC 4285 & MUSC 4295	Organ Survey and Organ Survey	6
PMUS 3616	Applied Instruction	7
Ensemble		2
Non-music electives		6
	Credit Hours	32
Year Four		
MUSC 4011	16th Century Counterpoint	2
MUSC 4997	Senior Recital	1
PMUS 4616	Applied Instruction	7
4000-level elective in musicology		3
Ensemble		1
Non-music electives		12
Free electives		2
	Credit Hours	28
	Total Credit Hours	120

Percussion Performance Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4

MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1626	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
	Credit Hours	28
Year Two		
EMUS 1417	Percussion Ensemble	2
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2918	Building Your Music Career	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2626	Applied Instruction	5
Ensemble		2
Music electives		3
Non-music electives		12
Free electives		1
	Credit Hours	34
Year Three		
EMUS 3417	Percussion Ensemble	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 2071	Instrumentation	2
MUSC 3176	Conducting 1	2
MUSC 3997	Junior Recital	1
PMUS 3626	Applied Instruction	6
Ensemble		2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Non-music electives		6

Free electives		3
	Credit Hours	32
Year Four		
EMUS 3417	Percussion Ensemble	2
MUSC 4081	Introduction to Music Technology	3
MUSC 4997	Senior Recital	1
PMUS 4626	Applied Instruction	6
4000-level elective in musicology		3
Ensemble		2
Non-music electives		3
Free electives		6
	Credit Hours	26
	Total Credit Hours	120

MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3081	Jazz Theory and Aural Foundations 1	3
EMUS 1427 or EMUS 1437	Jazz Ensemble or Jazz Combo	1
PMUS 1515	Jazz Piano Class	2
PMUS 2XXX	Applied Instruction	5
Ensemble		1
Music electives		4
Non-music electives		6
	Credit Hours	31

Percussion Performance with Secondary Emphasis in Jazz

(Available for Vibes/Marimba)

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
EMUS 1417	Percussion Ensemble	2
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
	Credit Hours	30

Year Three		
EMUS 3417	Percussion Ensemble	1
EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3176	Conducting 1	2
MUSC 3061 or MUSC 3071	Jazz Improvisation I or Jazz Improvisation II	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	6
Ensemble		1
Non-music electives		9
Free electives		1
	Credit Hours	31

Year Two		
EMUS 1417	Percussion Ensemble	2

Year Four		
EMUS 3427 or EMUS 3437	Jazz Ensemble or Jazz Combo	2
MUSC 3253	Jazz Techniques for the Music Educator	2

MUSC 4031	Jazz Arranging 1	2
MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	6
4000-level elective in musicology		3
Non-music electives		6
Free electives		6
	Credit Hours	28
	Total Credit Hours	120

MUSC 3081	Jazz Theory and Aural Foundations 1	3
PMUS 1XXX	Applied Instruction	5
Ensemble		2
Chamber Music		2
Music electives (performance minor for saxophone students)		4
Non-music electives		6
	Credit Hours	31

**Performance with Secondary Emphasis in Jazz
(Available for Trumpet, Trombone and Saxophone)
Sample Four-Year Plan of Study**

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
	Credit Hours	28
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 1515	Jazz Piano Class	2

Year Three		
EMUS 3427	Jazz Ensemble	1
EMUS 3437	Jazz Combo	1
MUSC 3061 or MUSC 3071	Jazz Improvisation I or Jazz Improvisation II	2
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	6
Ensemble		1
Chamber Music		1
Non-music electives		9
Free electives		1
	Credit Hours	31
Year Four		
EMUS 3427	Jazz Ensemble	2
EMUS 3437	Jazz Combo	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 4997	Senior Recital	1
MUSC 4031	Jazz Arranging 1	2
PMUS 4XXX	Applied Instruction	6
4000-level elective in musicology or MUSC 3642		3
Non-music electives		6
Free electives		6
	Credit Hours	30
	Total Credit Hours	120

Piano Performance Concentration Area Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1325	Piano Sight Reading	1
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 2365	Introduction to Accompanying	2
PMUS 1636	Applied Instruction	6
Written communication		3
Non-music electives		9
Free electives		2
	Credit Hours	32

Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2325	Applied Harmony for the Keyboard	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2636	Applied Instruction	5
PMUS 4105	Supervised Accompanyi	2
Non-music electives		12
Free electives		3
	Credit Hours	31

Year Three		
MUSC 3176	Conducting 1 (fall)	2
MUSC 3345 & MUSC 3355	Piano Pedagogy 1 and Piano Pedagogy 2	4
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6

MUSC 3997	Junior Recital	1
PMUS 3636	Applied Instruction	6
Ensemble		2
Performance minor		4
Non-music electives		6
	Credit Hours	31
Year Four		
MUSC 4325 & MUSC 4335	Keyboard Literature 1 and Keyboard Literature 2	4
MUSC 4997	Senior Recital	1
PMUS 4636	Applied Instruction	6
Ensemble		2
MUSC 4061 or MUSC 4071	Tonal Analysis or Post-Tonal Theory and Analysis	2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
4000-level elective in musicology		3
Non-music electives		6
	Credit Hours	26
	Total Credit Hours	120

String Performance Concentration Area: Double Bass, Viola, Violin and Violoncello Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
EMUS 1327	Symphony Orchestra	2
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	8
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2

Written communication	3
Non-music electives	6
Credit Hours	30

Year Two	
EMUS 1327	Symphony Orchestra 2
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory 4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4 2
MUSC 2997	Sophomore Proficiency 1
MUSC 3273	String Pedagogy and Literature 2
PMUS 2XXX	Applied Instruction 7
PMUS 2105 & PMUS 2205	Keyboard-Musicianship 3 and Keyboard-Musicianship 4 2
Chamber Music	2
Non-music electives	9
Free electives	1
Credit Hours	32

Year Three	
EMUS 3327	Symphony Orchestra 2
MUSC 2071	Instrumental 2
MUSC 3176	Conducting 1 2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2 6
MUSC 3997	Junior Recital 1
PMUS 3XXX	Applied Instruction 7
PMUS 4517	Orchestral Repertoire 2
Chamber Music	1
Non-music electives	6
Free electives	4
Credit Hours	33

Year Four	
EMUS 3327	Symphony Orchestra 2
MUSC 4997	Senior Recital 1
PMUS 4XXX	Applied Instruction 7
4000-level elective in musicology	3

Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)	2
Non-music electives	6
Free electives	4

Credit Hours	25
Total Credit Hours	120

Voice Performance Concentration Area

One year of study at the university level of each of two foreign languages is required of vocal performance majors.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1544 & MUSC 1554	Italian Diction and English Diction	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1726	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music electives		3
Free electives		3
Credit Hours		30

Year Two	
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory 4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4 2
MUSC 2997	Sophomore Proficiency 1

MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2	
MUSC 3464	German Diction	1	
PMUS 2105 & PMUS 2205	Keyboard-Musicianship 3 and Keyboard-Musicianship 4	2	
PMUS 2726	Applied Instruction	5	
Ensemble		2	
Non-music electives (including foreign language)		11	
Free electives		2	
	Credit Hours	32	
Year Three			
MUSC 3176	Conducting 1	2	
MUSC 3444	French Diction	1	
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6	
MUSC 3997	Junior Recital	1	
PMUS 3726	Applied Instruction	7	
Ensemble		2	
Non-music electives (including foreign language)		10	
Free electives		4	
	Credit Hours	33	
Year Four			
MUSC 4997	Senior Recital	1	
PMUS 4726	Applied Instruction	7	
PMUS 4137 & PMUS 4147	Opera Theatre 1 and Opera Theatre 2	2	
Ensemble		1	
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2	
4000-level elective in musicology		3	
Non-music electives		3	
Free electives		6	
	Credit Hours	25	
	Total Credit Hours	120	

Voice Performance with Elective Studies in Music Theatre

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1544 & MUSC 1554	Italian Diction and English Diction	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1726	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music electives		4
Free electives		2
	Credit Hours	30
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2105 & PMUS 2205	Keyboard-Musicianship 3 and Keyboard-Musicianship 4	2
PMUS 2726	Applied Instruction	5
PMUS 4157	Opera Practicum	1
Ensemble		1

THTR 1019	Script Laboratory: Text Analysis and Practice for the Theatre	3
Theatre/Dance electives		3
Non-music electives (including foreign language)		10
	Credit Hours	32
Year Three		
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3444	French Diction	1
MUSC 3464	German Diction	1
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
PMUS 3167	Opera Theatre Stagecraft	3
PMUS 3726	Applied Instruction	6
PMUS 4147	Opera Theatre 2	1
PMUS 4157	Opera Practicum	1
PMUS 4167	Opera Theatre Lab	1
THTR 2003	Acting 1	3
THTR 3053	Acting 2	3
Ensemble		2
Free electives		2
	Credit Hours	32
Year Four		
PMUS 4137	Opera Theatre 1	1
PMUS 4167	Opera Theatre Lab	2
PMUS 4726	Applied Instruction	6
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
4000-level elective in musicology		3
Senior project (or major role, or design or direction of a major production)		1
Theatre/dance electives		3
Non-music electives		3
Free electives		5
	Credit Hours	26
	Total Credit Hours	120

Woodwind Performance Concentration Area

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music electives		6
	Credit Hours	28
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied Instruction	7
Chamber music		2
Ensemble		2
Music electives		4
Non-music electives		12
	Credit Hours	34
Year Three		
MUSC 2071	Instrumentation	2
MUSC 3176	Conducting 1	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
PMUS 3XXX	Applied Instruction	7

Chamber Music		1
Ensemble		2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Non-music electives		6
Free electives		1
	Credit Hours	30
Year Four		
MUSC 4997	Senior Recital	1
PMUS 4XXX	Applied Instruction	7
Ensemble		2
4000-level elective in musicology		3
Music electives		3
Non-music electives		3
Free electives		9
	Credit Hours	28
	Total Credit Hours	120

Music - Bachelor of Arts in Music (BAMus)

The bachelor of arts in music degree has as its goal a broad education in music within a liberal arts context. Although students may elect to pursue special interests, the primary emphasis is on the development of basic musicianship, an ability to perform music and a broad knowledge of the foundations and principles of music as an art. The bachelor of arts in music may be completed with or without an emphasis in musicology and world musics.

The undergraduate degrees in music emphasize knowledge and awareness of:

- solo performance and technique, including the various musical styles used in compositions for students' musical instruments or voice;
- each composition performed, notation and editorial signs used in the compositions performed, and repertoire for the students' performance medium;
- ensemble performance, including familiarity with major composers in the student's performance medium and the techniques necessary to blend a number of individual musicians into an ensemble;
- concert and recital opportunities, including literature composed for different performance forces;
- theoretical studies, including tonal harmony, counterpoint, voice-leading and notation; formal principles and analytical techniques for tonal music; and instruments in score, including the concert pitch of transposing instruments and nomenclature used in scores; and
- historical studies, including representative works in the canon of musical literature from chant to the present, the general outlines of the history of music from the Middle Ages to the present, music in the United States and musical cultures other than those of Europe.

In addition, students completing any of the degrees in music are expected to acquire the ability to:

- perform solo and ensemble repertoire demonstrating musical artistry, technical proficiency and stylistic understanding;

- demonstrate an understanding of theoretical studies, including sight-reading and ear training; and
- demonstrate an understanding of historical studies including the analysis of stylistic periods and music of non-Western cultures.

Requirements

A minimum of 120 credit hours with an overall GPA of 2.00 must be earned for the BA in music degree. Of these credit hours, at least 68 (66 for musicology emphasis) must be in non-music courses. Thirty must be at the 3000 or 4000 level. A minimum of 44 credit hours (50 for musicology emphasis) is required in music courses.

The normal pattern for private applied instruction in this degree is one half-hour lesson per week for 2 credit hours. Not more than 16 credit hours (12 for musicology emphasis) in private instruction may be used toward the degree.

Students registered for applied music must participate in an ensemble as recommended by their applied faculty. A maximum of 4 credit hours (6 for musicology emphasis) in ensemble can apply to the BA in music degree.

A recital may be given with permission of the chair of the applied faculty area and the student's advisor.

Required Courses and Semester Credit Hours

In addition to the general requirements listed above, the following specific requirements must be met:

- Three credit hours of English composition.
- Basic proficiency in one foreign language equal to three semesters at the university level. This requirement also may be fulfilled by three years of study in high school in one language or by passing a university proficiency examination.
- Non-music electives to fulfill the minimum requirement of 68 credit hours. Of the non-music electives, 37 credit hours must be fulfilled through the College of Arts and Sciences core curriculum.

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	4

Free electives	1
Credit Hours	28
Total Credit Hours	120

Bachelor of Arts in Music with an Emphasis in Musicology and World Musics

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	4
Written communication		3
Ensemble		2
Foreign language		3
Non-music electives		9
	Credit Hours	32
Year Two		
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2988	Introduction to Music Research	1
MUSC 2997	Sophomore Proficiency	1
PMUS 2XXX	Applied Instruction	2
Ensemble		2
Non-music electives		18
	Credit Hours	30

Year Three		
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 4168	World Music Theories	3
4000-level elective in musicology		3
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
Ensemble		2
Non-music electives		15
	Credit Hours	31
Year Four		
MUSC 4112	Ethnomusicology	3
4000-level elective in musicology		3
Non-music electives		21
	Credit Hours	27
	Total Credit Hours	120

Jazz Studies - Certificate

The Jazz Program offers a certificate in jazz studies for undergraduate music majors.

Requirements

The certificate program consists of an intense 18-credit-hour curriculum in both academic and performance areas, concluding with a jazz recital. Courses include jazz theory and aural foundations, improvisation, history of jazz, scoring and arranging, jazz piano, jazz techniques for the music educator, jazz combo and jazz ensemble.

MUSC 3061	Jazz Improvisation I	2
MUSC 3081	Jazz Theory and Aural Foundations I	3
PMUS 1515	Jazz Piano Class	2
MUSC 4031	Jazz Arranging I	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 3071	Jazz Improvisation II (BM or BA)	2
MUSC 3642	History of Jazz I	3
EMUS 3427	Jazz Ensemble (Required to enroll in course twice.)	1
EMUS 3437	Jazz Combo	1

Music Entrepreneurship - Certificate

The Certificate in Music Entrepreneurship is an innovative program administered by The Entrepreneurship Center for Music ("ECM") in partnership with the Leeds School of Business. The certificate, open to music majors only, will include a *Minor in Business* plus academic and experiential credits within the College of Music. This robust curriculum positions the College of Music among the nation's leading programs in arts entrepreneurship. To qualify for the certificate, MUSC 2918 – *Building Your Music Career* must be successfully completed. For more information, contact Jeff Nytch at jeff.nytch@colorado.edu.

Requirements

The undergraduate in music entrepreneurship requires a minor in business (12 credit hours), plus six academic and experiential credit hours within the College of Music.

Interested students should elect participation in the certificate program by no later than the end of the sophomore year.

Overview Courses	6
MUSC 2918 Building Your Music Career	
MUSC 4988 The Entrepreneurial Artist	
TMUS 4493 Special Studies Omnibus	
Business Minor Courses	12
BUSM 2001 Principles of Marketing and Management	
BUSM 2002 Financial Accounting and Finance	
BUSM 4001 Professional Business Plan Development	
Business Track Courses (choose one)	
BUSM 3001 Managing Innovation in Organizations	
BUSM 3002 Business and Financial Analytics	
BUSM 3003 New Venture Creation: Intro to Entrepreneurship	
BUSM 3004 Global Business for Business Minors	

Music Technology - Certificate

The College of music is pleased to offer an 18 credit Certificate in Music Technology. The certificate is available to all undergraduates in good standing with the university. Music majors should enroll under the MUSC heading and non-majors should use the MUEL heading. For those courses that do not have an MUEL prefix non-majors will need instructor permission to enroll in the class. To qualify for the certificate, the 4081 introductory course must be successfully completed.

The curriculum consists of a variety of courses designed to provide a strong background in using technology to compose and produce music. The courses range from an introductory survey of music software and hardware to in depth studies of DSP, synthesis, algorithmic composition, recording and post-production techniques, film scoring, and many other topics. The software used in many of the classes includes Logic Pro, ProTools, Ableton Live, Finale, Lilypond, MAX, PD, SuperCollider, CSound, Final Cut Pro, Audacity, SoundHack, and Spear.

For more information, contact John Drumheller at drumhell@colorado.edu.

Requirements

This certificate program requires 18 credit hours, including five music technology courses.

Music Technology	12
MUSC/MUEL 4081 Introduction to Music Technology	
MUSC 2081 Prepared for the Soundcheck	
MUSC 2091 Recording Techniques	
MUSC 4011 16th Century Counterpoint	
MUSC/MUEL 4121 Topics in Music Technology ¹	
Electives	6

MUSC/MUEL 4121 Topics in Music Technology

ARSC 4040 Arts and Sciences Special Topics

TMUS 4423 Special Study Music Theory

MUSC 4121 Topics in Music Technology¹

¹ May be repeated up to three times as topics vary.

Music Education

The Music Education Department's experienced educators teach courses aimed at preparing students for a career in music education, combined with unique programs and opportunities for involvement. The CU Music Education program has resulted in 100 percent job placement for our graduates.

Because of the varying challenges and opportunities associated with teaching music in K–12 school contexts, the undergraduate music education curriculum strikes a balance between specialization and generalization. BME students must demonstrate a sufficiently broad knowledge of the entire music program/curriculum, but also possess the specialized skills necessary to be a successful general music, choir, orchestra or band instructor.

Admission to the Teacher Education Program

Teacher education is a campuswide function at the University of Colorado. Admission to the music education program in the College of Music does not constitute admission to the teacher education program. Students must apply to the School of Education through the music education chair no later than the second semester of the junior year or by the time 65 credit hours have been completed toward the BME degree (including approved transfer credits). Students may not register for certain education courses and student teaching until they are admitted to the teacher education program.

Requirements for recommended admission to the teacher education program are:

- Minimum GPA of 3.00 in music and music education, and a minimum cumulative GPA of 2.75.
- Minimum grade of C- in MUSC 2103.
- Twenty-five hours of documented, supervised field experience.
- Satisfactory functional piano ability as demonstrated by passing the proficiency examination or completing prescribed course work.
- Satisfactory performance ability as demonstrated by meeting the sophomore proficiency requirements in an applied area of study.
- Recommendation by the music education faculty. An interview with each student is held by the members of the music education faculty during the first semester of the sophomore year to review the student's progress and qualifications for admission to the teacher education program.

For further information, please refer to the *Handbook for Undergraduate Studies in Music Education*.

Student Teaching

Students wishing to receive a student teaching assignment must complete an application and submit it to the School of Education through

the chair of the music education faculty early in the semester preceding the student teaching semester. Prerequisites for student teaching are:

- Admission to the teacher education program.
- A minimum GPA of 3.00 in music and music education, and a minimum cumulative GPA of 2.75.
- Completion of all required music education and education courses in the music education curriculum.
- Satisfactory performance ability as demonstrated by passing the junior recital.
- Passing score on the PLACE Music Assessment.
- Recommendation by the music education faculty.

Bachelor's Degree

- Bachelor of Music Education (BMusEd) (p. 844)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Austin, James R (https://experts.colorado.edu/display/fisid_103455)
Professor; PhD, University of Iowa

Berg, Margaret H (https://experts.colorado.edu/display/fisid_118371)
Associate Professor; PhD, Northwestern University

Dockendorf, Matthew Paul (https://experts.colorado.edu/display/fisid_154511)
Instructor; MM, Ohio State University

Heil, Leila Theresa (https://experts.colorado.edu/display/fisid_149780)
Assistant Professor; PhD, University of Colorado Boulder

Miranda, Martina L (https://experts.colorado.edu/display/fisid_140091)
Associate Professor; DMA, Arizona State University

Rickels, David Aaron (https://experts.colorado.edu/display/fisid_151424)
Assistant Professor; DMA, Arizona State University

Roeder, Matthew J (https://experts.colorado.edu/display/fisid_120180)
Associate Professor; DMA, University of Colorado Boulder

MUSC 1081 (3) Intensive Music Theory

Introduces diatonic harmony and voice leading with intensive work on fundamentals (keys, intervals, triads, seventh chords and four-voice writing). The study of theoretical concepts is closely coordinated with aural skills. Feeds into the intensive section of MUSC 1111. Offered fall only.

Requisites: Requires corequisite course of MUSC 1121. Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1101 (2) Semester 1 Theory

Introduces the fundamentals of diatonic harmony and voice leading, focusing on model composition (including one-, two- and four-voice writing) and analysis of excerpts from music literature. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1103 (1) Becoming a Music Teacher

Provides an introduction to basic principles and practices of the music education profession. Explores contexts and methods of public school music teaching through class discussions, practice teaching and directed observations. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Letter Grade

MUSC 1111 (2) Semester 2 Theory

Continuation of MUSC 1101. Explores principles of harmony, voice leading and form. Continues emphasis on both model composition and analysis. Introduces chromatic elements (such as applied dominants and modulation), harmonic syntax and structural analysis of excerpts from music literature. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1101 or MUSC 1081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1121 (1) Aural Skills Lab, Semester 1

Focuses on sight singing, rhythm and dictation of diatonic melodies in major and minor keys (treble, alto and bass clefs). Covers identification of scale types, intervals, triads and dominant seventh chords. Includes individual and group improvisation. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1131 (1) Aural Skills Lab, Semester 2

Continuation of MUSC 1121. Focuses on sight singing, rhythm and dictation of diatonic melodies; adds chromatic elements, more complex rhythms and two-part dictation. Includes harmonic dictation using vocabulary from MUSC 1111. Includes individual and group improvisation within harmonic contexts. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1121 (minimum grade D-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1325 (1) Piano Sight Reading

Studies techniques for improving sight-reading skills at the keyboard, with practical work in solo, ensemble and choral literature. Also covers score reading and transposition. Restricted to piano majors or instructor consent required. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 1326 (1) Guitar Musicianship

Activities in sight-reading, fretboard harmony and comprehension of harmony and texture. Some work will be tied to the repertoire being studied in studio lessons. Open only to students with an emphasis on guitar performance in their degree plan.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 1544 (1) Italian Diction

Designed for the understanding of lyric Italian diction, the international phonetic alphabet, and its application to classical singing. Required for freshmen BM voice majors. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 1554 (1) English Diction

Designed for the understanding of lyric English diction, the international phonetic alphabet, and its application to classical singing as well as various musical styles of English classical voice literature. Required for Freshmen BM voice majors.

Requisites: Requires prerequisite course of MUSC 1544 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 1802 (3) Introduction to Musical Styles and Ideas

Introduces the study of musical traditions of the world; equips students with requisite skills for understanding and analyzing music as an art in historical and cultural contexts using an integrative approach that includes selected styles and genres, critical reading and writing skills and mastery of conceptual issues related to the discipline of music. Satisfies the World Music requirement for undergraduate students in the College of Music.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2071 (2) Instrumentation

Introduces the instruments in the orchestra by studying their ranges, idioms, histories and performance practices. Assignments center around hands-on scoring for instruments. Student arrangements will be performed in class during the semester. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 2101 and MUSC 2121 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2081 (2) Prepared for the Soundcheck

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering. Uses recorded material from in-class sessions. Examines differing approaches to recording as well as current technologies.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 2860

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2091 (2) Recording Techniques

Provides hands-on training in various audio recording techniques, acoustics and sound reinforcement, studio maintenance and troubleshooting. Real-world experience is gained through individual recording projects and College of Music events.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 2870

Requisites: Requires prerequisite course of MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2101 (2) Semester 3 Theory

Continuation of MUSC 1111. Reviews harmonic and formal concepts from MUSC 1111. Introduces advanced chromatic concepts such as modal mixture, seventh chords with added dissonance, Neapolitan sixth chord and augmented-sixth chords. Explores in-depth structural analysis of musical works. Offered fall only.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2103 (3) Introduction to Music Education

Provides an overview of basic principles and practices of the music education profession. Explores public school music teaching through class discussions, directed observations, and a supervised field experience. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 2111 (2) Semester 4 Theory

Continuation of MUSC 2101. Builds on and synthesizes harmonic, melodic and formal concepts from semesters 1-3. Includes writing about musical structure and analyzing relationships of musical structure to extramusical elements (such as text, performance technique, dance, staging, etc.). Introduces 20th century compositional techniques. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2101 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2121 (1) Aural Skills Lab, Semester 3

Continuation of MUSC 1131. Applies concepts from MUSC 2101 in performance (prepared, from sight and improvised) and analytical listening (transcription, diction and aural analysis). Offered fall only.

Requisites: Requires prerequisite course of MUSC 1131 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2131 (1) Aural Skills Lab, Semester 4

Continuation of MUSC 2121. Applies concepts from MUSC 2111 in performance (prepared, from sight and improvised) and analytical listening (transcription, dictation and aural analysis). Offered spring only.

Requisites: Requires prerequisite course of MUSC 2121 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2325 (2) Applied Harmony for the Keyboard

Provides an intensive study and application of the harmonic structure of music in a variety of keyboard skills: figured bass realization, chord progressions, harmonization, improvisation, transposition, on-sight harmonic analysis and playing by ear. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 1325 (all minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 2365 (2) Introduction to Accompanying

An overall study in the art of working with instrumentalists and singers including repertoire and orchestral reductions. Requires performance with a student instrumentalist or singer to be critiqued and coached by class and instructor. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1325 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 2366 (2) Guitar Accompanying

Survey of accompanying repertoire for guitar with solo instruments (flute, violin, voice, etc.), including introductory work in basso continuo, playing/improvising from chord charts, and arranging accompaniments from musical scores.

Requisites: Requires prerequisite course of MUSC 1326 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 2608 (1) Alexander Technique

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5608

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 2772 (3) World Musics: Asia and Oceania

Highlights music in Asia and Oceania using current ethnomusicological materials.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2782 (3) World Musics: Africa, Europe, and the Americas

Use current ethnomusicological materials and methods in the study of music outside the Western art tradition. Usually taught in the spring, focuses on music cultures of Africa, Europe and the Americas.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2918 (2) Building Your Music Career

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5918

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 2988 (1) Introduction to Music Research

Introduces music research tools and basic writing skills to provide information fluency and skills necessary for successful composition of formal music research papers. Applies curricular goals to specific topics of students' choice.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 2997 (1) Sophomore Proficiency

To be completed by the second semester of the sophomore year.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Theses and Recitals

MUSC 3013 (1) String Class

For music education majors with choral/general emphasis. Develops basic performance skills on two or more string instruments. Addresses teaching strategies and other specialized topics related to string instruction. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3023 (1) Woodwind Class

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3033 (1) Brass Class

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3051 (2) Beginning Composition

Covers issues relating to the craft of musical composition with analysis and writing in various styles. This introductory course is designed for music majors who are not composition majors. Some of the assignments will be read in class. Offered spring term of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3061 (2) Jazz Improvisation I

Develops skills in jazz improvisation through practical application of harmonic concepts, melodic construction, rhythmic awareness, transcription, repertoire and analysis. Open to all instruments. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite for non-jazz majors MUSC 2111.

Additional Information: Departmental Category: Theory and Composition

MUSC 3071 (2) Jazz Improvisation II

Continues and expands upon the material presented in MUSC 3061. Reinforcement of ability to create an improvised melody in a range of harmonic contexts including blues, bebop, modal jazz, free jazz, and other styles. Offered spring only.

Requisites: Requires prerequisite course of MUSC 3061 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3081 (3) Jazz Theory and Aural Foundations 1

Presents the grammar and syntax of jazz. Helps to gain a greater understanding of the inner workings and application of chord progressions as they relate to the jazz idiom including major key harmony, secondary dominants, modal interchange and modulation. Students will demonstrate their understanding of these components through written assignments, singing, aural recognition, transcription and keyboard demonstration.

Requisites: Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 3071 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3133 (2) Teaching General Music I

Provides an overview of general music teaching with emphasis on developmentally appropriate strategies and materials. Required for all music education majors as partial fulfillment of course work leading to K-12 music licensure. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3153 (2) Teaching Woodwind Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3163 (2) Teaching String Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more string instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate string instruction. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3176 (2) Conducting I

Introduces conducting and rehearsal techniques. Performance participation in the appropriate ensemble (band, choir or orchestra). Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 3186 (2) Conducting II

Introduces conducting and rehearsal techniques. Department enforced corequisite: performance participation in the appropriate ensemble (band, choir, or orchestra). Offered spring only.

Requisites: Requires prerequisite course of MUSC 3176 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 3193 (2) Vocal Pedagogy and Literature for Young Voices

Provides an overview of vocal anatomy/function, care of the voice, vocal repertoire, teaching strategies, and other specialized topics related to singing instruction in both private studio and public school choral settings. Fall section for instrumentalists; spring section for vocalists.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3223 (2) Teaching Brass Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3253 (2) Jazz Techniques for the Music Educator

Prepares the music educator for successful experiences teaching jazz at the secondary level. Students gain insights into performance and rehearsal techniques for the instrumental jazz ensemble. Explores approaches for teaching jazz theory, improvisation, and selecting literature for young students. Own instrument required for certain classes. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisites MUSC 1111 and MUSC 2103.

Additional Information: Departmental Category: Music Education

MUSC 3273 (2) String Pedagogy and Literature

Examines instructional methods/materials and pedagogical approaches appropriate for beginning to advanced string students in private studio, small ensemble, or large ensemble contexts. Topics may include group teaching strategies, as well as contemporary approaches including Rolland and Suzuki. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisites MUSC 2103 and MUSC 3163.

Additional Information: Departmental Category: Music Education

MUSC 3345 (2) Piano Pedagogy 1

Discusses teaching philosophies, objectives, and procedures. Examines and evaluates methods and materials. Studies practical aspects with which the private teacher is concerned. Offered fall of even-numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 3355 (2) Piano Pedagogy 2

Materials and techniques for teaching piano with a focus on the intermediate level student. Offered only in spring of odd-numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 3363 (2) Marching Band Techniques

Helps develop the skills needed to administer and teach all aspects of a contemporary high school marching band. Includes drill conception and design, instruction, organization, and administration. Offered fall only.

Requisites: Requires prerequisite course of MUSC 2103 and EMUS 1287 (all minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3444 (1) French Diction

Designed for the understanding of lyric French diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of French classical vocal literature. Required of Junior BM voice majors.

Requisites: Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Recommended: Prerequisite MUSC 3464.

Additional Information: Departmental Category: Voice

MUSC 3464 (1) German Diction

Designed for the understanding of lyric German diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of German classical vocal literature. Required of sophomore BM voice majors.

Requisites: Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 3642 (3) History of Jazz 1

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from its origins up to the 1950's, including the various traditions, practices, historical events and people most important to its evolution. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 3772 (3) West African Music and Culture in Ghana

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 3772

Requisites: Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

Additional Information: Departmental Category: Musicology

MUSC 3802 (3) History of Music 1

Surveys Western art music with stylistic analysis of representative works from all major periods through the Baroque. See also MUSC 3812.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 3812 (3) History of Music 2

Surveys Western art music with stylistic analysis of representative works from all major periods after the Baroque. See also MUSC 3802.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 3997 (1) Junior Recital

To be completed by the second semester of the junior year.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 2997. Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 4001 (2) New Musical Styles and Practices

Explores a variety of music from the 20th and 21st centuries beginning with Stravinsky and moving through current trends. Involves a mix an analysis/exploration of this music with short composition assignments imitating the different styles. Offered spring of odd-numbered years.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5011

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4012 and MUSC 5012

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the style. Offered fall only.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4031 (2) Jazz Arranging 1

Study of notation, score layout, transpositions, basic harmonic and melodic analysis, basic chord voicings, and composition for a small and large jazz ensemble. Use of notation software such as Finale or Sibelius. Offered fall semester only.

Requisites: Requires prerequisite course of MUSC 3091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4041 (2) Orchestration

Studies advanced orchestration techniques through score analysis and student projects. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 2071 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4061 (2) Tonal Analysis

Surveys tonal analytical techniques and forms of tonal music, including binary forms, ternary forms, rondo (and others) through study of selected works. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4071 (2) Post-Tonal Theory and Analysis

Focuses on theory and analysis of post-tonal literature pre-1945. Offered fall of odd-numbered years.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5078

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite piano majors.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 4081 (3) Introduction to Music Technology

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4081 and CMDP 3860

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4091 (2) Jazz Arranging 2

Continuation and expansion of studies in MUSC 4031. Survey and analysis of major composers and arrangers of the idiom. Course focuses on creating several arranging projects for a jazz ensembles. Offered spring of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 4031 (minimum grade D-). Restricted to College of Music undergraduate students only.

Recommended: Prerequisite MUSC 3081.

Additional Information: Departmental Category: Theory and Composition

MUSC 4101 (1-3) Theory and Aural Skills Review

Reviews tonal harmony, voice leading, and essential aural skills. Prepares graduate students for more advanced work in music theory. Students may register for aural skills only (1 credit), theory only (2 credits) or both theory and aural skills (3 credits). May not be taken pass/fail. Aural skills section offered fall and spring. Theory section offered spring.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4103 (1) Introduction to Student Teaching

Represents the first half of the professional internship year. Familiarizes students with the schools and music programs in which they plan to student teach. Music placements may consist of elementary and high school, elementary and middle school, or middle school and high school.

Requisites: Requires a prerequisite course of MUSC 4113 or MUSC 4313 or MUSC 4443 (minimum grade C-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4106 (2) Guitar Literature

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5106

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 4111 (2) Composing at the Computer

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4112 (3) Ethnomusicology

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4113 (3) Teaching General Music 2

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental and speech-based arrangements. Offered fall only.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4121 (3) Topics in Music Technology

Exploration of issues, techniques, and tools of music technology. Topics vary from term to term and may include: interactive systems for performance; teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia, sound design and analysis. Lectures on work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4122 (3) Music in Jewish Culture

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4122

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 4133 (3) Student Teaching Practicum

Offers practice teaching under the guidance of a master music teacher.

Requisites: Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4142 (3) American Indian Music

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5142

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4143 (2) Developing Children's Choirs

Examines the musical skills, teaching techniques and administrative procedures necessary for developing a children's choir. Offered fall term of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5143

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4151 (3) Topics in Music Analysis

Examines critically a specific topic or repertory, such as Song Analysis or Music of Brahms. Uses readings and analyses, with grades to be determined from reading responses, analytical assignments and writing. Offered fall of even-numbered years.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade B).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theory and Composition

MUSC 4152 (3) East Asian Music

Surveys the development of music in Japan, China and Korea through the in-depth study of particular styles of traditional music. The course emphasizes the study of music and culture, particularly music's relationship to religion, politics, language, literature, dance and theatre.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology
Departmental Category: Asia Content

MUSC 4153 (1) Percussion Class and Pedagogy

Required of all music education majors. Presents knowledge and skills necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4163 (2) Choral Literature for School Ensembles

Examination of literature, materials, and methods appropriate for teaching choral music in secondary schools. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4168 (3) World Music Theories

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5168

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Recommended: Prerequisite MUSC 1802 or MUSC 2772 or MUSC 2782 or MUSC 4112.

Additional Information: Departmental Category: Theory and Composition

MUSC 4191 (2) Advanced Recording

Study of advanced recording techniques and concepts beyond those covered in MUSC 2091 involving multiple microphones for ensemble concerts and recording sessions within and outside of the College of Music. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 2091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4193 (1) Student Teaching Seminar

Required for all music student teachers. Addresses topics of concern to beginning teachers including classroom management, interpersonal skills, legal issues, job search strategies and capstone project development.

Requisites: Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4202 (3) Special Topic in Musicology: Current and Critical Issues

Examination of a specific topic of current or critical interest within areas of music history, ethnomusicology, critical theory and practice across the spectrum of Western, Popular and World Music traditions. Designed as a capstone course for music majors who have completed a full complement of musicology courses. Topics vary from term to term. Instructor consent is required for non-music majors.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 4203 (1) Music Methods Practicum

Provides students with opportunities to observe and practice the use of various teaching techniques and relate them to concepts presented in the methods course. Students consult with the instructor to determine appropriate placements in schools.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Requires corequisite course of MUSC 4313 or MUSC 4443. Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4255 (2) Service Playing Techniques

Study of church music for liturgical and non-liturgical denominations; includes hymn playing, anthem accompaniments, basics of conducting from the organ console and improvisation and selection of organ music appropriate to the requirements of the church year and other special services.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5255

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4285 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present. See also MUSC 4295.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5285

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4295 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present. See also MUSC 4285.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5295

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4313 (3) Teaching Choral Music

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5313

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 2103.

Additional Information: Departmental Category: Music Education

MUSC 4325 (2) Keyboard Literature 1

Surveys keyboard music from 1600 to 1830. Offered fall semester of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4335 (2) Keyboard Literature 2

Surveys keyboard music from 1830 to the present. Offered spring semester of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4405 (2) Basso-Continuo Accompaniment

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5405

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4443 (3) Teaching Instrumental Music

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5443

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4583 (2) Inclusive Music Classroom

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5583

Requisites: Requires prerequisite courses of MUSC 2103 and MUSC 3133 (all minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 4113.

Additional Information: Departmental Category: Music Education

MUSC 4608 (1) Advanced Studies in the Alexander Technique

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 2608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5808

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 2608 (minimum grade C-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 4666 (3) Chamber Music Lit WW/Prc

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 4712 (3) Renaissance Music

Provides a repertory and analysis of polyphonic music, 1400-1600.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5712

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4752 (3) Women in Music

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5752

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4772 (3) History of Opera

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5772

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 or MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4802 (3) Studies in 20th Century Music

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5802

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4852 (3) 17th and Early 18th Century Music

Examines music and writings about music from the Baroque era. Emphasizes cultural and musical analysis and surveys current musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5852

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4862 (3) African American Music

Examines the sacred and secular genres of Black American music from folk spirituals to contemporary gospel and hip-hop in their cultural and historical contexts. Examines individual composers and performers in specific historical contexts in order to understand the meanings behind certain Black musical stylistics, sound ideals and aesthetic preferences. Formerly MUSC 2802.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4872 (3) Late 18th and 19th Century Music

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5872

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4892 (3) Latin American Music

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5892

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4908 (1-3) Internship in Music Business

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5908

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4957 (1-4) Senior Thesis

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 4958 (2) Community Performances

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5958

Requisites: Requires prerequisite course of MUSC 2918 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4978 (3) Arts Administration & Management

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5978

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4988 (3) The Entrepreneurial Artist

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5988

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 2918.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4997 (1) Senior Recital

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite class of MUSC 3997 (minimum grade D-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

NCMU 1172 (0.3-3) Body Mapping for Musicians

Repeatable: Repeatable for up to 3.00 total credit hours.

NCMU 1177 (0.3-3) Kabuki: A Musical Theater

Repeatable: Repeatable for up to 3.00 total credit hours.

NCMU 1178 (0.3-3) Getting Inside the Music of the Colorado Music Festival

Repeatable: Repeatable for up to 3.00 total credit hours.

Music Education - Bachelor of Music Education (BMusEd)

The Music Education Department's experienced educators teach courses aimed at preparing students for a career in music education, combined with unique programs and opportunities for involvement. The CU Music Education program has resulted in 100 percent job placement for our graduates.

Because of the varying challenges and opportunities associated with teaching music in K–12 school contexts, the undergraduate music education curriculum strikes a balance between specialization and generalization. BME students must demonstrate a sufficiently broad knowledge of the entire music program/curriculum, but also possess the specialized skills necessary to be a successful general music, choir, orchestra or band instructor.

Program Emphases

Four basic curricular options are provided for students pursuing the Bachelor of Music Education degree:

- choral
- choral—general
- instrumental
- instrumental—general

The choral-general and instrumental-general emphases include a larger concentration of course work and field experiences related to elementary general music teaching, while the choral and instrumental emphases involve more specialized course work and field experiences related to the teaching of choir, orchestra or band classes at the secondary level. Within each degree emphasis, students have a limited number of elective credits that may be used to further customize degree work according to their interests and needs.

As first-year students, BME students complete core studies in music and liberal arts. The first music education courses and early field experiences are completed during the sophomore year. During the junior year, students enroll in capstone methods courses and specialized electives that allow for more detailed and sustained study of curricular models, instructional materials, and teaching methods. Internships and full-time student teaching provide culminating experiences during the senior year, as students work in partnership with experienced public school teachers and assume the role and responsibilities of a professional music educator. Internship and student teaching placements are chosen in consultation with faculty advisors and the music education chair.

Dual Degree Program

BMus/BMusEd in Music Performance and Music Education

Qualified music majors who have been approved by the relevant major departments may elect to complete a dual degree in music performance (woodwinds, brass and percussion, strings, voice or jazz emphasis) and music education (instrumental or choral tracks). Requirements for these dual degree programs range from 139 to 148 credit hours, and a minimum of 10 semesters of study (including one semester of full-time student teaching) is typically necessary to complete all requirements.

Requirements

Program Requirements

A minimum of 126 credit hours with a cumulative GPA of 2.75 must be earned for the BME degree, with no grade below C- in a course. In addition to 40 credit hours of teacher education course work and 150 clock hours of early field experience, music education majors complete 24 credit hours in liberal arts disciplines (English composition, literature and arts, mathematics, social sciences, natural sciences) and 62 credit hours in music (music theory and aural skills, musicology and ethnomusicology, applied study, ensemble, keyboard and voice, and conducting). Core requirements in liberal arts and music are designated by the music

education faculty and approved by the College of Music curriculum committee.

Areas of Emphasis

Choral Music Emphasis

Students must take keyboard or voice as the primary applied area, or petition the music education faculty for an exception. A minimum of five of the seven semesters of required ensemble registration must be in a conducted choral ensemble (University Singers, University Choir, Collegiate Chorale or Women's Chorus). For keyboard majors, two semesters of independent accompanying may be applied to the ensemble requirement. Students must be enrolled in a conducted choral ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) and Conducting II (MUSC 3186).

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
MUSC 1544	Italian Diction	1
MUSC 1554	English Diction	1
PMUS 1105 & PMUS 1184	Keyboard Musicianship 1 and Voice Class	2
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		6
	Credit Hours	36
Year Two		
EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	3
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2

MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
PMUS 2205 & PMUS 1184	Keyboard-Musicianship 4 and Voice Class	2
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3
	Credit Hours	35
Year Three		
EDUC 4023	Differentiated Instruction in Diverse Secondary Classrooms	3
MUSC 3013	String Class	1
MUSC 3023 or MUSC 3033	Woodwind Class or Brass Class	1
MUSC 3176 & MUSC 3186	Conducting I and Conducting II	4
MUSC 3444 or MUSC 3464	French Diction or German Diction	1
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4143	Developing Children's Choirs	2
MUSC 4203	Music Methods Practicum	1
MUSC 4313	Teaching Choral Music	3
PMUS 3XXX	Applied Instruction	5
Conducted choral ensemble		2
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
	Credit Hours	32

Year Four		
EDUC 4112 or EDUC 4411	Educational Psychology and Adolescent Development or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1
MUSC 4153	Percussion Class and Pedagogy	1
MUSC 4163	Choral Literature for School Ensembles	2
MUSC 4193	Student Teaching Seminar	1
PMUS 4XXX	Applied Instruction	3
4000-level elective in musicology		3
Ensemble		1
	Credit Hours	23
	Total Credit Hours	126

Choral—General Music Emphasis

Students must take keyboard or voice as the primary applied area, or petition the music education faculty for an exception. A minimum of six of the seven semesters of required ensemble registration must be in a conducted choral ensemble (University Singers, University Choir, Collegiate Chorale or Women's Chorus), and one semester must be in a world music ensemble. For keyboard majors, two semesters of independent accompanying may be applied to the ensemble requirement. Students must be enrolled in a conducted choral ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) and Conducting II (MUSC 3186).

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3

PMUS 1105 & PMUS 1184	Keyboard Musicianship 1 and Voice Class	2
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		6

Credit Hours 34

Year Two

EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	3
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
PMUS 2205 & PMUS 1184	Keyboard-Musicianship 4 and Voice Class	2
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3

Credit Hours 35

Year Three

EDUC 4023	Differentiated Instruction in Diverse Secondary Classrooms	3
MUSC 3013	String Class	1
MUSC 3023 or MUSC 3033	Woodwind Class or Brass Class	1
MUSC 3176 & MUSC 3186	Conducting I and Conducting II	4

MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1

MUSC 4113	Teaching General Music 2	3
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MUSC 4143 or MUSC 4163	Developing Children's Choirs or Choral Literature for School Ensembles	2
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MUSC 4313	Teaching Choral Music	3
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MUSC 4203	Music Methods Practicum	1
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PMUS 3XXX	Applied Instruction	5
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Conducted choral ensemble		2
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Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
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Credit Hours 34

Year Four

EDUC 4112 or EDUC 4411	Educational Psychology and Adolescent Development or Educational Psychology for Elementary Schools	3
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EDUC 4732	Student Teaching K-12	8
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MUSC 4103	Introduction to Student Teaching	1
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MUSC 4153	Percussion Class and Pedagogy	1
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MUSC 4193	Student Teaching Seminar	1
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MUSC 4583	Inclusive Music Classroom	2
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PMUS 4XXX	Applied Instruction	3
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4000-level elective in musicology		3
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Ensemble		1
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Credit Hours 23

Total Credit Hours 126

Instrumental Music Emphasis (Band)

Students must take wind/brass/percussion as the primary applied area, or petition the music education faculty for an exception. A minimum

of five of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble (Symphony Orchestra, Wind Symphony, Symphonic Band or Concert Band) and one semester must be in marching band. Freshmen are strongly encouraged to be in Marching Band (EMUS 1287) their first semester. Students must be enrolled in a conducted instrumental ensemble when concurrently enrolled in Conducting I (MUSC 3176) and Conducting II (MUSC 3186).

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1XXX	Applied Instruction	6
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		6
	Credit Hours	34
Year Two		
EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	3
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3153	Teaching Woodwind Instruments	2

MUSC 3163	Teaching String Instruments	2
PMUS 1184	Voice Class	1
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3
	Credit Hours	36

Year Three		
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms	3
MUSC 3176 & MUSC 3186	Conducting I and Conducting II	4
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3223	Teaching Brass Instruments	2
MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 3363	Marching Band Techniques	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4153	Percussion Class and Pedagogy	1
MUSC 4203	Music Methods Practicum	1
MUSC 4443	Teaching Instrumental Music	3
PMUS 3XXX	Applied Instruction	5
Conducted instrumental ensemble		2
	Credit Hours	34

Year Four

EDUC 4112 or EDUC 4411	Educational Psychology and Adolescent Development or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1
MUSC 4193	Student Teaching Seminar	1
PMUS 4XXX	Applied Instruction	3
Ensemble		1
4000-level elective in musicology		3
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
	Credit Hours	22
	Total Credit Hours	126

Instrumental Emphasis (Strings)

Students must take strings as the primary applied area, or petition the music education faculty for an exception. A minimum of five of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble (Symphony Orchestra or Campus Orchestra). Students must be enrolled in a conducted instrumental ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) and Conducting II (MUSC 3186).

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	6

Ensemble	2
Written communication	3
Non-music core requirements	6
Non-music electives	6

Credit Hours 34

Year Two

EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	3
MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3153	Teaching Woodwind Instruments	2
MUSC 3163	Teaching String Instruments	2
MUSC 3273	String Pedagogy and Literature	2
PMUS 1184	Voice Class	1
PMUS 2XXX	Applied Instruction	5

Credit Hours 35

Year Three

EDUC 4023	Differentiated Instruction in Diverse Secondary Classrooms	3
MUSC 3176 & MUSC 3186	Conducting 1 and Conducting II	4
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3223	Teaching Brass Instruments	2

MUSC 3253	Jazz Techniques for the Music Educator	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1
MUSC 4153	Percussion Class and Pedagogy	1
MUSC 4203	Music Methods Practicum	1
MUSC 4443	Teaching Instrumental Music	3
PMUS 3XXX	Applied Instruction	5
Conducted instrumental ensemble		2
Non-music core requirements		3
	Credit Hours	35

Year Four

EDUC 4112 or EDUC 4411	Educational Psychology and Adolescent Development or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1
MUSC 4193	Student Teaching Seminar	1
PMUS 4XXX	Applied Instruction	3
Ensemble		1
4000-level elective in musicology		3
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
	Credit Hours	22
	Total Credit Hours	126

Instrumental—General Music Emphasis

Students must take keyboard, strings or wind/brass/percussion as the primary applied area, or petition the music education faculty for an exception.

For keyboard majors, a minimum of four of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble (Symphony Orchestra, Chamber Orchestra, Wind Symphony, Symphonic Band, Concert Band or Campus Band), one semester must be in a conducted choral ensemble, and one semester must be in a world

music ensemble. One semester of independent accompanying may be applied to the ensemble requirement.

For string majors, a minimum of five of the seven semesters of required ensemble registration must be in a conducted instrumental ensemble, one semester must be in a conducted choral ensemble, and one semester must be in a world music ensemble.

For woodwind, brass and percussion majors, a minimum of four of the seven semesters of required ensemble participation must be in a conducted instrumental ensemble, one semester must be in marching band, one semester must be in a conducted choral ensemble, and one semester must be in a world music ensemble.

Freshmen are strongly encouraged to be in Marching Band (EMUS 1287) their first semester. Students must be enrolled in a conducted instrumental ensemble when concurrently enrolled in Conducting 1 (MUSC 3176) and Conducting II (MUSC 3186).

Sample Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
MUSC 1101 & MUSC 1111	Semester 1 Theory and Semester 2 Theory	4
MUSC 1121 & MUSC 1131	Aural Skills Lab, Semester 1 and Aural Skills Lab, Semester 2	2
MUSC 1802	Introduction to Musical Styles and Ideas	3
PMUS 1105 & PMUS 1205	Keyboard Musicianship 1 and Keyboard-Musicianship 2	2
PMUS 1XXX	Applied Instruction	6
Ensemble		2
Written communication		3
Non-music core requirements		6
Non-music electives		6
	Credit Hours	34
Year Two		
EDUC 3013	School and Society	3
MUSC 2101 & MUSC 2111	Semester 3 Theory and Semester 4 Theory	4
MUSC 2103	Introduction to Music Education	3

MUSC 2121 & MUSC 2131	Aural Skills Lab, Semester 3 and Aural Skills Lab, Semester 4	2
MUSC 2997	Sophomore Proficiency	1
MUSC 3133	Teaching General Music I	2
MUSC 3153 or MUSC 3223	Teaching Woodwind Instruments or Teaching Brass Instruments	2
MUSC 3163	Teaching String Instruments	2
PMUS 1184	Voice Class	1
PMUS 2XXX	Applied Instruction	5
Ensemble		2
Non-music core requirements		6
Non-music electives		3
	Credit Hours	36
Year Three		
EDUC 4023	Differentiating Instruction in Diverse Secondary Classrooms	3
MUSC 3176 & MUSC 3186	Conducting I and Conducting II	4
MUSC 3193	Vocal Pedagogy and Literature for Young Voices	2
MUSC 3253 or MUSC 3273 or MUSC 3363 or MUSC 4583	Jazz Techniques for the Music Educator or String Pedagogy and Literature or Marching Band Technique or Inclusive Music Classroom	2
MUSC 3802 & MUSC 3812	History of Music 1 and History of Music 2	6
MUSC 3997	Junior Recital	1

MUSC 4113	Teaching General Music 2	3
MUSC 4203	Music Methods Practicum	1
MUSC 4443	Teaching Instrumental Music	3
PMUS 1184	Voice Class	1
PMUS 3XXX	Applied Instruction	5
Conducted instrumental ensemble		2
	Credit Hours	33
Year Four		
EDUC 4112 or EDUC 4411	Educational Psychology and Adolescent Development or Educational Psychology for Elementary Schools	3
EDUC 4732	Student Teaching K-12	8
MUSC 4103	Introduction to Student Teaching	1
MUSC 4153	Percussion Class and Pedagogy	1
MUSC 4193	Student Teaching Seminar	1
PMUS 4XXX	Applied Instruction	3
Ensemble		1
4000-level elective in musicology		3
Upper-division music theory elective (3000- or 4000-level theory classes, except MUSC 4101)		2
	Credit Hours	23
	Total Credit Hours	126

Academic Enrichment Programs Education Abroad

CU Boulder Education Abroad offers over 400 approved programs in more than 70 countries around the world. Program options exist for every major and are offered for every term including winter break and summer break (the latter has numerous options of varying lengths and credit amounts). Planning for study abroad varies by major, but it is recommended that you have an initial planning conversation with your Academic Advisor as early as possible. A growing list of over 10,000 pre-approved courses provides course options abroad for various degree requirements. Program costs vary widely and include over 30 programs that are comparable to semester costs for in-state students. Students can use existing financial aid and institutional scholarships for a semester/year abroad, and additional scholarship opportunities exist.

Please see the following links for additional information and resources:

- Click here (<http://abroad.colorado.edu/index.cfm?FuseAction=Programs.AdvancedSearch>) to search for programs by major, location, term, program type, cost and more.
- Click here (http://abroad.colorado.edu/index.cfm?FuseAction=Programs.SearchResults&Program_Name=&Program_Type_1=Pre-Health&pc=%7F&pr=%7F&pt=%7F&Partner_ID=ANY&p_5=Faculty-Led+Global+Seminar%7F&p_5_t=MULTI&p_20=%7F&p_20_t=MULTI&p_6=%7F&p_6_t=MINIM&p_7=%7F&p_7_t=MULTI&p_14=%7F&p_14_t=MULTI&p_19=%7F&p_19_t=MULTI&p_21=%7F&p_21_t=MULTI&p_17=%7F&p_17_t=MULTI&p_23=%7F&p_23_t=MULTI&p_28=%7F&p_28_t=MULTI&Sort=Program_Name&Order=asc&pp=5%2C20%2C26%2C7%2C14%2C19%2C21%2C17%2C23%2C28) to view a list of summer/winter break faculty-led Global Seminar courses.
- Click here (http://abroad.colorado.edu/index.cfm?FuseAction=Abroad.ViewLink&Parent_ID=0&Link_ID=B207274A-0059-71A5-E694D487757CFC7C) to view study abroad guides for various majors and pre-approved course lists.

Library Research

Several courses in information access and library research methods are offered to students who wish to explore the structure, organization, retrieval and evaluation of information for their study and career needs.

Course code for this program is LIBR.

LIBR 2000 (3) Research Strategies on the Electronic Campus

Critical examination and practical exploration of computer technologies, digital communication, and electronic information systems and services for new students.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

LIBR 3010 (3) Methods of Electronic Library Research

Exploration of the structure, organization, retrieval, and evaluation of electronic information sources through the formulation of search strategies useful for undergraduate research.

LIBR 3900 (1-3) Independent Library Research

In-depth library research project for upper-division students. Instructor consent required.

LIBR 4029 (1) Art History Research Methods

Learn to expertly navigate art scholarship and be prepared to do thesis-level research. An introduction to the vast array of art historical resources and their uses. Explore advanced techniques for searching both online and offline sources of art information. Master the various modes of art historical research, including finding iconographic, historical, or technical information.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4029 and ARTH 5029

LIBR 4900 (1-3) Independent Library Research

In-depth library research project for upper-division students. Instructor consent required.

Preprofessional Programs

Preprofessional advising resources have been developed at CU Boulder to help undergraduate students, and previously graduated students, prepare for further study at professional schools. CU Boulder does not offer preprofessional undergraduate majors or degrees. Completion

of preprofessional prerequisites does not guarantee admission to a professional school. However, preprofessional advisors are well-equipped to provide information about professional schools within Colorado, and beyond, and can help students to prepare well for further professional study.

Pre-Health Programs

Students can prepare to enter the undergraduate professional health science program in nursing at the Anschutz Medical Campus of the University of Colorado by taking courses on the Boulder campus.

Students whose goals include entering the medical, dentistry, physical therapy, physician assistant, pharmacy or public health programs and schools at the Anschutz Medical Campus, or the veterinary medicine or occupational therapy programs at Colorado State University in Fort Collins, can complete any undergraduate major at CU Boulder. In most cases, these students are required to complete a baccalaureate degree before entering professional school. In fact, a baccalaureate degree is recommended for most health professions.

At the time of application to a professional school, students are judged on several factors, including performance in undergraduate courses. For this reason, no required course may be taken on a pass/fail basis. Some fields require specific preprofessional examinations before application. For most fields, interviews are an essential part of the application process.

In all cases, admission committees are concerned with students' compassion, coping and decision-making abilities, intellectual capabilities, realistic self-appraisal, sensitivity in interpersonal relations and staying power (physical and motivational). In addition to formal course work, students should have experience in people-related activities (especially those related to their field of choice), so that they can be more certain of their motivation for health careers. Also, health-related activities expose premed and other health science hopefuls to various patients and illnesses. The health professions require, or strongly recommend, such experience.

Some of the professional programs at the Anschutz Medical Campus give preference to Colorado residents and residents of WICHE (Western Interstate Commission on Higher Education) states; interested students should check with individual programs for specific policies. Students from other states usually can obtain at CU Boulder the preprofessional courses required by their state schools, but should check with those schools in advance. Students are encouraged to apply to their state school, as well as to other public and private professional schools, to increase their chances of gaining acceptance to the professional program of their choice.

During the preprofessional years, personal intellectual development leads many students to change professional goals. Since there are usually more applicants for these programs than there are spaces available, many students need to pursue alternative goals. Therefore, students should plan college programs to give themselves the greatest flexibility in considering other vocations.

Advising for preprofessional study in the health sciences is conducted through the Preprofessional Advising Office in the University Club. Check the pre-health advising (<http://www.colorado.edu/advising/pre-health>) website for information on prerequisite courses, events, volunteer opportunities, student pre-health organizations, applications and many other useful resources. Students should attend a pre-health advising session at orientation, then begin to follow the Pre-Health Pathway

sequence of meetings early in their undergraduate careers to help plan course work and extracurricular experience in preparation for applying to programs of their choice. Current students and alumni may schedule pre-health meetings through MyCUHub (<http://www.colorado.edu/mycuhub>). The Preprofessional Advising Office offers an extensive array of workshops and informational meetings, as well as a spring Health Professions Information Day.

Pre-Law

Students who plan to apply to law school upon completing their baccalaureate degree do not have to complete any specific course requirements for admission to law school. Instead, they should major in the discipline that best suits their intellectual interests and talents. Pre-law students should seek a rigorous and broad-based education that will ensure them a fundamental understanding of American society and its institutions. Students should become familiar with mathematical analysis and scientific reasoning, and develop excellent oral and written communication skills.

Pre-law advising is available in the Preprofessional Advising Office. In addition, the Preprofessional Advising Office sponsors a fall Law Fair, spring Law Day and a year-long speaker series. Contact the Preprofessional Advising Office in University Club 111 for more information. Check the pre-law advising (<http://www.colorado.edu/advising/pre-law>) webpage for information on events, the student pre-law organization, applications and many other useful resources. Current students and alumni may schedule pre-law advising appointments through MyCUHub (<http://www.colorado.edu/mycuhub>). (<http://aacportal.colorado.edu>)

Presidents Leadership Class

The Presidents Leadership Class (PLC) is a specially designed, top scholar community with both academic and experiential curricula that focus on leadership development through an exploration and honing of our five domains of leadership development (<http://www.colorado.edu/plc/plc-advantage/how-we-develop-leadership>). Skills are developed in interdisciplinary, academic and experiential environments and through exposure to the key industries of Colorado. PLC students are from any school or college participate in the Presidents Leadership Class curriculum as part of their regular course work.

The Presidents Leadership Class is a program of CU Boulder and has a Board of Advocates representing Colorado business, educational, nonprofit and government communities.

Admission and Enrollment

Admission to the Presidents Leadership Class is considered one of the highest honors awarded to incoming University of Colorado Boulder students. Most Presidents Leadership Class students are admitted prior to the beginning of their first year at CU Boulder, however, a maximum of 10 spots are reserved for qualified rising sophomores in a second point of entry. Selection criteria include academic excellence, demonstrated commitment outside of self, leadership potential, uniqueness of contribution to the incoming cohort, humility and grit. Each year, 50 first-year students are enrolled, comprising both Colorado residents and nonresidents. Instructions on how to apply to PLC are available on the PLC website (<http://www.colorado.edu/plc>). The application is part of the University of Boulder Scholarships Application through the Office of Financial Aid and Scholarship Services. The application is due by

February 15th. To access the application, visit the Apply Now (<http://www.colorado.edu/plc/apply-now>) webpage.

Only students who are accepted into the Presidents Leadership Class are eligible to enroll in PLC courses (PRLC) with few exceptions for PRLC 2820 and 3810. Students receive Arts and Sciences core credit in *Ideals and Values* for PRLC 1810; and core credit in *Contemporary Societies* for PRLC 1820.

Academic Program

PLC provides students with unique academic courses, purposeful experiential education and real-life experiences that:

- Support academic and professional excellence
- Grow critical thinking and analytical capabilities
- Develop extraordinary creativity
- Hone abilities of thoughtful implementation
- Cultivate moral reasoning, and instill an ethic of service and character

PLC provides opportunities by uniting the support of the university, local and statewide leaders. The academic curriculum is supplemented by a substantial experiential learning curriculum and professional development opportunities.

For more information on the PLC Curriculum Strategy and the research behind it, visit the Presidents Leadership Class (<http://www.colorado.edu/plc>) website.

Required Courses

PRLC 1810	Ethical Leadership	3
PRLC 1820	Community Issues in Leadership	3
PRLC 2820	Multilevel Issues in Leadership	3
PRLC 3810	Global Issues in Leadership	3
LEAD 4000	Leadership in Context and Emerging Challenges: A Capstone (required for the Minor in Leadership Studies)	4

Total Credit Hours 16

Scholarship Programs and Opportunities

PLC offers many scholarships to fully participating students over the course of their undergraduate career. The first-year award is a merit award of \$1,000 that is awarded upon selection into the program. The first-year scholarship is non-renewable. However, PLC students have the opportunity to apply or be nominated for a number of other scholarships to substantially help fund their undergraduate education upon their second year in the program. Below is a list of available scholarships primary to PLC students. All PLC allocated scholarships are dispersed through the Office of Financial Aid, and are calculated directly against the cost of tuition.

- William A. Douglas Endowment
- FirstBank Scholars
- El Pomar-SLE
- Flanagan & Walker Scholarships
- Hoelscher Memorial Scholarship
- Annabelle K. Lutz Voss Scholars
- David A. Van Landschoot Family Scholarship
- Brian Watson Foundation Scholarship

- Tim Pestotnik Scholarship
- Leo Hill Endowment
- PLC Enrichment Fund Scholarship
- PLC Student Staff Fellowship

Courses

PRLC 1810 (3) Ethical Leadership

Introduces fundamental principles of leadership and ethics. Emphasizes application of the principles for self-development and organizational effectiveness.

Requisites: Restricted to students in the Presidents Leadership Class (PPLC) only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

PRLC 1820 (3) Community Issues in Leadership

Explores challenges to leadership at the community level such as drug abuse, poverty, decline of infrastructure, care of the aged, etc. Gives particular attention to the development of effective leadership responses to community difficulties at university, city, state, and national levels.

Requisites: Restricted to students in the Presidents Leadership Class (PPLC) only.

Grading Basis: Letter Grade

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

PRLC 2820 (3) Multilevel Issues in Leadership

Studies multilevel issues that originate in organizational settings but carry community and global implications. Encourages students to fully explore the complexity and interrelatedness of issues with a special emphasis on leadership and ethical implications.

PRLC 2930 (1-3) Leadership Internship

Students analyze the leadership styles within a host organization, examine how successfully an organization fulfills its mission and further refine their own theories of what constitutes effective leadership. Students also complete a meaningful project over the course of the internship. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

PRLC 3800 (3) Global Inquiry for 21st Century Leadership

Introduces students to the ways in which leadership and sustainable development theory converge, challenges students to examine these issues in specific contexts around the world, and provides them with practical training in cross-cultural competency and leadership skills.

Recommended: Prerequisite PRLC 1810 or PRLC 1820 or PRLC 2820.

Grading Basis: Letter Grade

PRLC 3810 (3) Global Issues in Leadership

Examines the challenges to leadership posed by major global issues. Problems in the areas of human rights, hunger, disease, large-scale collective violence and environmental deterioration are explored with a special emphasis on the development of effective, long-term leadership strategies. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

PRLC 4010 (3-4) 21st Century Leadership

An advanced course that focuses on critical analysis of leadership principles and techniques. Designed to provide theoretical and hands-on experience for individuals who wish to function in leadership roles at high levels of competence in the workplace and in the civic arena.

Requisites: Requires prerequisite courses of PRLC 1810 and PRLC 1820 (all minimum grade D-). Restricted to students in the Presidents Leadership Class (PPLC) only.

PRLC 4081 (3) Icons of the American Republic

Examines the founding period of the United States through the events, political concepts and individuals depicted in the art exhibited in the U.S. Capitol Building in Washington, D.C. The course includes a visit to the U.S. Capitol Building, the floor of the U.S. House of Representatives, the floor of the U.S. Senate, and an exploration of the legislative process.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223 or PSCI 2004.

Additional Information: Departmental Category: American

Reserve Officers Training Corps (ROTC)

Enrollment in Reserve Officers Training Corps (ROTC) programs is open to both men and women, and ROTC lower-level leadership courses are open to all students whether or not they contract with ROTC.

All services provide undergraduate and selected graduate students with the opportunity to combine academic study with a military officer's educational program. The three services conduct courses in their respective areas leading to a regular or reserve commission upon graduation.

Military Programs

- Air Force Aerospace Studies (U.S. Air Force) (p. 854)
- Military Science (U.S. Army) (p. 855)
- Naval Science (U.S. Navy & U.S. Marine Corps) (p. 857)

Air Force Aerospace Studies (U.S. Air Force)

U.S. Air Force ROTC offers several programs leading to a commission in the U.S. Air Force upon receipt of at least a baccalaureate degree.

CU Boulder students who wish to register for AFROTC classes sign up for them through the normal course registration process. AFROTC credit for graduation varies with each college. Students should contact the appropriate college for credit determination.

Scholarship Programs

Air Force College Scholarship Program

Normally a scholarship board is held at the end of each semester for students who have at least one semester of full-time college credit. Prior participation in AFROTC may not be required to compete for these scholarships. Students can compete for scholarships in most academic majors. Students selected for this program receive scholarships that pay up to \$18,000 in tuition, a book allowance, nonrefundable educational

fees and subsistence each month, tax-free. These scholarships are available in all academic disciplines and are two to three years in length.

USAF Medical Programs

Qualified nursing students can compete for nursing scholarships. These scholarships can lead to a career as an Air Force officer, serving as a nurse. Students may also compete for a prehealth designator. If selected, they would receive a scholarship for medical school.

Requirements

Programs

Other programs are frequently available based on current Air Force needs. The unit administrative officer in Boulder (303-492-3128) can discuss the best alternatives. Interested students should make initial contact as early as possible to create the best selection opportunity, as selection is on a competitive basis. There is no obligation until a formal contract is entered.

Standard Four-Year Program

This standard program is designed for incoming freshmen, or any student with four years remaining until degree completion. It consists of three parts: the general military course (GMC) for lower-division (normally freshman and sophomore) students; the professional officer course (POC) for upper-division students (normally juniors and seniors); and the leadership laboratory (LLAB) attended by all cadets. Completion of a four-week summer field training program is required prior to commissioning.

Modified Four-Year Program

Certain undergraduate and graduate students may be eligible for this program. It is offered to full-time, regularly enrolled degree students and requires at least five semesters of full-time college work (undergraduate or graduate level, or a combination). May only be available to students pursuing academic majors in demand. Those selected for this program must complete the field training program during the summer months as a prerequisite for entry into the professional officer course the following fall semester.

Leadership Lab

All AFROTC cadets must attend leadership lab (two hours per week). The laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities and the life and work of an Air Force junior officer.

Courses

AIRR 1010 (1) Foundations of the United States Air Force 1

One 1-hour lecture and one 2-hour lab per week. Introduces students to the U.S. Air Force and the USAF officer profession. Uses instructor lectures, films and videos, and group activities to examine Air Force issues, officership qualities, and military customs and courtesies. Emphasizes the communication skills necessary for an Air Force officer.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 1020 (1) Foundations of the United States Air Force 2

One 1-hour lecture and one 2-hour lab per week. A continuation of AIRR 1010.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 2010 (1) The Evolution of USAF Air and Space Power 1

One 1-hour lecture and one 2-hour lab per week. Studies air power from balloons and dirigibles through the jet age and historically reviews air power employment in military and nonmilitary operations in support of national objectives. Looks at the evolution of air power concepts and doctrine and introduces the development of communicative skills.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 2020 (1) The Evolution of USAF Air and Space Power 2

One 1-hour lecture and one 2-hour lab per week. A continuation of AIRR 2010.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 3010 (3) Air Force Leadership Studies I

Two 1 1/2-hour seminars plus one 2-hour lab per week. Provides an integrated management course emphasizing concepts and skills required by the successful manager and leader. Includes individual motivational and behavioral processes, leadership, communication, and group dynamics while providing foundation for the development of the junior officer's professional skills (officership). Emphasizes decision making and use of analytic aids in planning, organizing and controlling in a changing environment. Discusses organizational and personal values (ethics), management of change, organizational power, politics, managerial strategy, and tactics within the context of military organization. Uses actual Air Force case studies throughout the course to enhance the learning and communication process.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 3020 (3) Air Force Leadership Studies II

Two 1 1/2-hour seminars and one 2-hour lab per week. Continuation of AIRR 3010. Emphasizes basic managerial processes while employing group discussions, case studies, and role playing as learning devices. Continues to emphasize the development of communicative skills.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 4010 (3) National Security Affairs/Preparation for Active Duty

Two 1 1/2-hour seminars and one 2-hour lab per week. Studies U.S. national security policy which examines the formulation, organization, and implementation of national security policy; context of national security; evolution of strategy; management of conflict; and civil-military interaction. Also includes blocks of instruction on the military profession/officership, the military justice system, and communicative skills. Provides future Air Force officers with the background of U.S. national security policy so they can effectively function in today's Air Force.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 4020 (3) National Security Forces in Contemporary American Society 2

Two 1 1/2-hour seminars and one 2-hour lab per week. A continuation of AIRR 4010. Includes defense strategy conflict management, formulation/implementation of U.S. defense policy, and organizational factors and case studies in policy making, military law, uniform code of military justice, and communication skills.

Additional Information: Departmental Category: Air Force Aerospace Studies

Military Science (U.S. Army)

The Department of Military Science is a leadership program leading to an officer's commission in the Active Army, Army Reserve or National

Guard in conjunction with an undergraduate or graduate degree. Military science courses supplement a regular degree program and offer practical leadership and management experience. Scholarships are available for those that qualify. Additionally, financial benefits may be available for enlisted soldiers.

The course code for this program is MILR.

Scholarship Programs

College freshmen, sophomores and juniors may be eligible for four-, three- and two-year scholarships, regardless of academic major. Interested students must enroll in Army ROTC and meet eligibility requirements, including an army physical fitness test.

High school scholarship applicants may be eligible for four- and three-year college scholarships. High school students can apply during their junior year and before January 10 of their senior year.

All scholarship recipients receive full tuition and fees, a \$1,200 book allowance and a stipend of \$300–500 per month during the academic year. Students interested in scholarships should contact the enrollment and scholarship officer at armyrotc@colorado.edu, 303-492-3549 or 303-492-6495.

Simultaneous Membership Program

College sophomore and juniors who want additional leadership training, may participate with an Army Reserve or Army National Guard unit as an officer trainee. Students participating in this program earn approximately \$240 in monthly drill pay, plus a monthly ROTC stipend of \$300–500. Additionally, SMP participants receive Army National Guard or reserve tuition benefits of up to \$4,500 per year. Enlisted and prior service students retain their authorized GI benefits.

Army ROTC Course Credit

ROTC is an elective credit in most departments. Individual academic advisors verify if ROTC classes count toward the student's degree.

Registration

Army ROTC classes begin with MILR prefix. Register for classes through the normal course registration process. For more information, visit the the Army ROTC (<http://www.colorado.edu/arotc>) website or contact the enrollment and scholarship officer at CU Boulder at armyrotc@colorado.edu, 303-492-3459 or 303-492-6495.

Requirements

Four-Year Program

For college freshmen, the four-year program consists of two phases: the basic course (freshman and sophomore years) and the advanced course (junior and senior years).

Basic Courses (MSI & MSII)

Basic courses (MSI & MSII) cover Army history and organization as well as military leadership and management. Labs provide the opportunity to develop leadership experience while learning basic military skills. Participating in the basic courses incur no military obligation, except for those receiving an Army scholarship.

Advanced Courses (MSIII & MSIV)

Advanced courses (MSIII & MSIV) cover leadership, tactics and unit operations, training techniques, military law and professional ethics.

Additionally, a four-week summer leadership camp at Fort Knox, Kentucky, is a requirement between the junior and senior year, and is a prerequisite for commissioning. Students enrolled in the advanced courses must have completed the basic courses (or the equivalent) and obtain permission from the professor of military science (PMS).

Two-Year Program

For college students entering as a sophomore, the two-year program consists of the advanced courses, preceded by a four-week summer ROTC cadet initial entry training (CIET) at Fort Knox, Kentucky. Inquiries into CIET should be directed to the Department of Military Science prior to completing the sophomore year. CIET is a paid internship and the academic equivalent to the MS1/MSII basic courses.

Prior service and enlisted soldiers who have completed basic training may be eligible to enroll in the advanced course without attending CIET or completion of the ROTC basic courses. Enlisted soldiers pursuing advanced placement must obtain permission from the PMS.

Courses

MILR 1011 (2) Adventures in Leadership 1

Introduces fundamentals of leadership and the United States Army. Examines its organization, customs, and history as well as its current relevance and purpose. Students also investigate basic leadership and management skills necessary to be successful in both military and civilian settings. Includes fundamentals of Army leadership doctrine, team-building concepts, time and stress management, an introduction to cartography and land navigation, marksmanship, briefing techniques, and some basic military tactics.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 1021 (2) Adventures in Leadership 2

Continues the investigation of leadership in small organizations. Covers selected topics such as basic troop leading procedures, military first aid and casualty evacuation concepts, creating ethical work climates, an introduction to Army organizations and installations, and a further examination of basic military tactics. Introduces students to effective military writing styles.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 2031 (3) Methods of Leadership and Management 1

Comprehensively reviews advanced leadership and management concepts including motivation, attitudes, communication skills, problem solving, human needs and behavior, and leadership self development. Students continue to refine effective written and oral communications skills and to explore topics such as the basic branches of the Army, and officer and NCO duties. Students conduct classroom and practical exercises in small unit light infantry tactics and are prepared to perform as midlevel leaders in the cadet organization.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 2041 (3) Methods of Leadership and Management 2

Focuses on leadership and management functions in military and corporate environments. Studies various components of Army leadership doctrine to include the four elements of leadership, leadership principles, risk management and planning theory, the be-know-do framework, and the Army leadership evaluation program. Continue to refine communication skills.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 3052 (3) Military Operations and Training 1

Further explores the theory of managing and leading small military units with an emphasis on practical applications at the squad and platoon levels. Students examine various leadership styles and techniques as they relate to advanced small unit tactics. Familiarizes students with a variety of topics such as cartography, land navigation, field craft and weapons systems. Involves multiple, evaluated leadership opportunities in field settings and hands-on experience with actual military equipment. Students are given maximum leadership opportunities in weekly labs.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 3062 (3) Military Operations and Training 2

Studies theoretical and practical applications of small unit leadership principles. Focuses on managing personnel and resources, the military decision making process, the operations order and oral communications. Exposes the student to tactical unit leadership in a variety of environments with a focus on preparation for the summer advance camp experience.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 3090 (1) Military Theory and Tactical Leadership

Application of military domain knowledge, small unit leadership skills and education on various subjects germane to military operations. Examination of military tactics, techniques and procedures to better understand how to successfully accomplish multiple military requirements. Instructor consent required.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a corequisite course of MILR 1011 or 1021 or 2031 or 2041 or 3052 or 3062 or 4072 or 4082.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 4072 (3) Leadership 1: Adaptive Leadership

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: discusses personal growth, effective communication, critical thinking, problem solving and ethical leadership.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 4082 (3) Leadership 2: Leadership in a Complex World

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: develops universal leadership attributes such as critical thinking and problem solving, understanding the contemporary operating environment and improved inter-personal dynamics/team building skills.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 4840 (1-3) Independent Study

Additional Information: Departmental Category: Military Science (U.S. Army)

Naval Science (U.S. Navy & U.S. Marine Corps)

Scholarship Programs

NROTC offers two-, three- and four-year scholarship programs, and two-year and four-year college (non-scholarship) programs. Navy scholarships may be earned while students are enrolled in the college program. Scholarship students receive tuition and fees, a \$375 book allowance per semester and a \$250 per month subsistence allowance. This subsistence allowance gradually rises to \$400 by the student's senior year. College program students receive a \$350 per month subsistence allowance their junior year and \$400 per month subsistence allowance their senior year in the program.

Naval science (Navy option) scholarship students must complete one year of calculus, physics and English, one semester of American military history or national security policy and a cultural course. Students should check with their naval science instructor to determine specific course offerings that fulfill the above requirements.

Commissioned Service

Opportunities for commissioned service are presently available in the unrestricted line (surface, subsurface, aviation, special warfare and special operations) in the U.S. Navy. Opportunities in ground and aviation specialties are available in the U.S. Marine Corps. Students interested in other programs leading to commissions in either the U.S. Navy or U.S. Marine Corps are encouraged to contact the NROTC unit on campus. All commissioning programs require that the student be working toward, and receive, a college degree.

The Navy also offers a program leading to a regular commission in the Marine Corps.

The course code for this program is NAVR.

Requirements

The number of NROTC credit hours that may count toward degree requirements is determined by the individual colleges. Students should therefore consider their college's policy when formulating their degree plan.

Naval science course work is offered in the fall and spring semesters only.

Required Courses and Semester Credit Hours

Required Courses (11 credits)

NAVR 1010	Introduction to Naval Science	2
NAVR 2020	Seapower and Maritime Affairs	3
NAVR 4010	Leadership and Management	3
NAVR 4020	Leadership and Ethics	3

U.S. Navy Courses (12 credits)

NAVR 3020	Naval Operations and Seamanship	3
NAVR 3030	Naval Engineering Systems	3
NAVR 3040	Weapons and Systems Analysis	3
NAVR 4030	Navigation	3

U.S. Marine Corps Courses (6 credits)

NAVR 3101	Evolution of Warfare	3
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NAVR 4101 Amphibious Warfare

3

For additional information, visit the Naval Reserve Officers Training Corps (<http://www.colorado.edu/nrotc>) website.

Courses

NAVR 1010 (2) Introduction to Naval Science

Introduction to the naval profession. Instruction emphasizes the mission, organization and warfare components of the Navy and Marine Corps. Included is an overview of officer and enlisted ranks and rates, training, education, Naval customs and courtesies, military justice, leadership and nomenclature. Exposes the student to the professional competencies required to become a Naval/Marine Corps officer.

Additional Information: Departmental Category: Naval Science

NAVR 1840 (1-3) Independent Study

Additional Information: Departmental Category: Naval Science

NAVR 2020 (3) Seapower and Maritime Affairs

Surveys international maritime history and provides a review of American maritime history and policy. Examines American naval involvement in regional and global conflicts, evolution in technology and management, the role of the navies in foreign policy, and the influence of seapower on history.

Additional Information: Departmental Category: Naval Science

NAVR 3020 (3) Naval Operations and Seamanship

Examines the Inland and International Rules of the Nautical Road, including court interpretations, principles of relative motion and vector analysis with the maneuvering board, ship handling procedures, weather, communications, tactical operations, and maritime law.

Additional Information: Departmental Category: Naval Science

NAVR 3030 (3) Naval Engineering Systems

Studies in detail ship propulsion and related auxiliary systems. Emphasizes fossil fuel and nuclear steam and gas turbine systems. Stresses design constraints imposed by unique marine environment.

Additional Information: Departmental Category: Naval Science

NAVR 3040 (3) Weapons and Systems Analysis

Introduces theoretical concepts upon which modern naval weapons systems are designed and constructed. Specific areas of study include physics of underwater sound propagation, pulse radar theory, automatic tracking principles, and fundamentals of missile guidance.

Additional Information: Departmental Category: Naval Science

NAVR 3101 (3) Evolution of Warfare

Traces the development of warfare, focusing on the impact of military theorists and technical developments. Assists students to acquire a sense of strategy, develop an understanding of military alternatives, and see the impact of historical precedent on military actions.

Additional Information: Departmental Category: Naval Science

NAVR 3201 (3) Fundamentals of Maneuver Warfare

Prepares future military officers and other leaders for service by studying modern tactical principles, current military developments and other aspects of warfare and their interactions with and influences on maneuver warfare doctrine.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Naval Science

NAVR 4010 (3) Leadership and Management

Comprehensively studies organizational leadership. Emphasizes motivation, communication, empowerment, and needs of subordinates. Studies the role of professional and personal ethics in organizational leadership.

Additional Information: Departmental Category: Naval Science

NAVR 4020 (3) Leadership and Ethics

Studies the ethics and laws of armed conflict analyzing the leadership responsibilities of officers both in peace and in war. The curriculum focuses first on various moral, ethical and leadership philosophies followed by extensive use of case studies to reinforce the use of ethical decision-making tools. Defines the responsibilities of junior officers within the context of ethical leadership and decision making.

Additional Information: Departmental Category: Naval Science

NAVR 4030 (3) Navigation

Offers theory and practical application in the art of navigation: charts, publications, piloting, dead reckoning, navigation aids and instruments, time, electronic fixing, global positioning system, and voyage planning.

Additional Information: Departmental Category: Naval Science

NAVR 4101 (3) Amphibious Warfare

Surveys the development of amphibious doctrine. Emphasizes the evolution of amphibious warfare in the 20th century and beyond. Explores present-day potential and limitations on amphibious operations, including the rapid force deployment concept.

Additional Information: Departmental Category: Naval Science

Special Undergraduate Enrichment Programs

Special Undergraduate Enrichment Programs include:

- Boettcher Scholars
- Norlin Scholars
- Professional and Academic Conference Endowment (PACE)
- Undergraduate Research Opportunities Program (UROP)
- Top Scholarship Office

The programs offer actively engaged students an undergraduate education that in whole or in part:

- cultivates a deeper sense of interconnectedness and interdependence
- inspires intentional inquiry
- engages questions in academic, professional, public and global contexts
- nurtures students' personal and professional growth
- invites multiple ways of knowing and making meaning
- deepens personal, cultural and social awareness
- honors joy, play, empathy, humor, compassion, spirit, curiosity, and creativity as essential elements of knowing, learning, relating and being

Please see our website (<http://www.colorado.edu/suep>) for more information.

Boettcher Scholars

The Boettcher Scholarship is a merit-based, full-ride scholarship awarded annually to Colorado high school seniors who can apply those funds to any four-year institution in Colorado. With a history of scholars on campus dating from 1952, the University of Colorado Boulder has a large, vibrant Boettcher Scholar community housed in Special Undergraduate Enrichment Programs.

Benefits of Being a Boettcher Scholar

- An on-campus Boettcher Scholar Mentor
- The largest Boettcher Scholar peer community in the state
- The longest-standing Boettcher Scholar Alumni network in the state
- Individual, peer and group mentoring
- Academic, professional and personal support
- Social activities with Boettcher Scholars and SUEP members
- Access to enrichment, research and Top Scholarship advising
- A fifth-year tuition benefit for concurrent degree seekers

Apply

High school students apply for the scholarship directly through the Boettcher Foundation in the Fall of their senior year. Once selected, scholarship recipients have the opportunity to choose which campus they'll attend.

Norlin Scholars

The interdisciplinary Norlin Scholars Program is geared toward students interested in a liberal education. Norlin Scholars develop expertise in their chosen fields through research, deep engagement and self-reflection. Upon graduation, they're in a strong position for whatever comes next: the job market, graduate and professional schools or fellowships.

Benefits of Being a Norlin Scholar

Students can apply as high school seniors for a 4-year scholarship or as second-year college students for a 2-year scholarship. Norlin applicants must apply to CU first, though you needn't be an admitted student.

Benefits of being a Norlin Scholar include:

- a \$5000 scholarship per academic year
- additional funding for enrichment activities like research or study abroad
- small, invigorating courses (NRLN 2000 and NRLN 3500)
- research or creative projects with faculty
- individual, group and peer mentoring
- access to top scholarship advising and guidance
- opportunities for professional training and development
- a stimulating, interdisciplinary peer group

The Norlin Scholars program builds community through shared experiences and support. Explore what it means to be a Norlin Scholar and the scholar support system by looking at our website (<http://www.colorado.edu/suep/scholars/scholar-community>).

Apply

Visit the Norlin Scholars (<http://www.colorado.edu/suep/boettcher-norlin-scholars/norlin-scholars>) website for application information.

Professional and Academic Conference Endowment

PACE provides funding, support and mentoring to qualified undergraduates to present their work at conferences. Conference presentations may be oral presentations, poster sessions, roundtable discussions, or creative or performance pieces. Students from all majors, departments, colleges and schools are welcome to apply for PACE grants.

Aside from receiving funds toward conference expenses, recipients benefit from faculty and peer supported conference preparation and exposure to working professionals and cutting edge scholarship in the field. Additionally, conference presentations:

- Complement classroom learning
- Take undergraduate research to the next level
- Provide a range of professional credentials

Applying for PACE funding

To accommodate the year-round schedule of professional conferences, PACE deadlines are rolling. Consult the PACE website (<http://www.colorado.edu/suep/professional-and-academic-conference-endowment-pace>) for more information.

Undergraduate Research Opportunities Program

CU Boulder has a rich culture for cultivating undergraduates as emerging scholars, artists and practicing researchers. UROP provides consultation services, informational workshops and grants to promote undergraduate research as a high-impact learning practice for student success.

Each year UROP funds hundreds of students who produce new knowledge and creative work in partnership with CU's world-class faculty. We serve students and faculty whose learning and teaching goals include outside-the-classroom enrichment.

In a UROP project, you:

- Explore academic interests *beyond* the classroom
- Get hands-on experience with research or creative production
- Develop student-faculty relationships for professional references
- Acquire academic and professional skills and credentials
- Demonstrate successful grant-writing skills
- Refine your academic and career goals

Applying for a UROP Grant

From development of a research interest or question to completion of an application takes some time. UROP deadlines precede the academic year in which the research or creative work will be undertaken and students apply in partnership with the faculty mentor. Visit the UROP website (<http://www.colorado.edu/suep/about-urop>) for more information.

Top Scholarships

We're here to help you prepare a thoughtful application to some of the most prestigious, nationally competitive scholarships offered, like the Rhodes, Marshall, Truman, and Goldwater, among others. This office helps high-achieving students already enrolled at CU, usually in their sophomore, junior, or senior years. For help with scholarships for incoming freshmen, or to inquire about scholarships already awarded,

please contact The Office of Financial Aid (<http://www.colorado.edu/financialaid>).

What We Provide

- Guidance in selecting a fellowship or scholarship that fits your plans
- Expert advice on scholarship opportunities listed
- Individualized assistance preparing applications, essays, and proposals
- Practice interviews and interview strategies

Please see our website (<http://www.colorado.edu/suep/top-scholarships>) for more information, including benefits of making an application to Top Scholarships (<http://www.colorado.edu/suep/top-scholarships/why-apply>) and how to apply (<http://www.colorado.edu/suep/top-scholarships/applying-0>).

Undergraduate Residential Programs Residential Academic Programs (RAPs)

A number of the residence halls are home to residential academic programs (RAPs), whereby students live in and take special classes in their hall that meet core curriculum and/or other course requirements. All of these programs charge additional \$850 fees per academic year. For detailed information about each RAP, see the Residential Academic Programs (<http://living.colorado.edu/get-involved/raps>) section.

- **Baker RAP** (<http://living.colorado.edu/get-involved/raps-baker>) is designed for freshmen and sophomores in the College of Arts and Sciences interested in the natural sciences and environmental studies.
- **CMCI/Communication RAP** offers 200 first- and second-year students a program to explore many different areas of communication, ranging from processes of face-to-face interaction to the impact of media and technology on daily life.
- **Engineering Honors RAP** provides educational experiences that match the abilities and ambitions of some of the very best students at CU.
- **Farrand RAP** (<http://living.colorado.edu/get-involved/raps-farrand>) offers small seminar courses in the liberal arts taught by award-winning faculty selected to help create a close intellectual and social community. About 400 mostly first-year students from the College of Arts and Sciences participate. The program focuses on the study of the humanities within the larger frame of culture and society.
- **Global Engineering RAP** (<http://living.colorado.edu/get-involved/raps-global-engineering>) prepares engineering students for the new global conditions of the engineering professions through experiencing international culture, mastering a second language and gaining confidence with IT-driven international communication and collaboration.
- **Global Studies RAP** (<http://living.colorado.edu/get-involved/raps-global-studies>) promotes the recognition of global interdependence, encourages the study of foreign languages and international affairs and emphasizes the value of international education. This year-long program connects participants with a peer group of students who have similar interests and goals. The staff is knowledgeable about CU Boulder's many international resources, and the faculty incorporate international work into their teaching and research.
- **Health Professions RAP** accommodates approximately 225 students. This community is ideal for students interested in exploring coursework and career options in the health professions such as

practitioners, researchers or policymakers. Courses offered include a mix of natural science, social science and general education courses appropriate for first- and second-year students interested in study or careers related to health care or health care policy.

- **Honors RAP** (<http://living.colorado.edu/get-involved/raps-honors>) is the residential component of the Honors Program of the College of Arts and Sciences. It promotes and sustains academic excellence within a lively community setting. Students take one, onsite, seminar-style three-credit-hour course each semester. Beyond the classroom, Honors RAP offers a variety of co-curricular and student-led activities that enhance the learning experience. It is open to approximately 335 first-year and continuing honors-qualified students.
- **Leeds Business RAP** (Leeds RAP) is a targeted community that is comprised exclusively of students who are business majors. Leeds RAP seeks to build individuals who are well-rounded, prepared, engaged and equipped to succeed in 21st century workplaces and take roles as global leaders. Students in the program develop supportive relationships with faculty and staff, including an in-house academic advisor, as well as with peer mentors.
- **Libby Arts RAP** (<http://living.colorado.edu/get-involved/raps-libby>) (LRAP) is designed primarily for first- and second-year College of Arts and Sciences students interested in the arts. LRAP offers a curriculum in the arts, including visual arts, theatre and dance, film studies and writing. The program also offers a variety of courses that fulfill university core requirements from a number of disciplines including economics, art history and integrative physiology. In addition to small class sizes in a living and learning environment, co-curricular activities provide a sense of community and a unique opportunity to interact with faculty and LRAP advisors across art disciplines.
- **Pre-Business RAP** (<http://living.colorado.edu/get-involved/raps-pre-business>) is a community of first-year students pursuing a business degree, but have not yet been directly admitted into the Leeds School of Business. The program provides a supportive and preparatory path for students to transfer into Leeds their sophomore year.
- **Sewall RAP** is a co-educational program for first- and second-year students enrolled in the College of Arts and Sciences or the Leeds School of Business who have an interest in the study of history and culture. Its award-winning faculty offer small seminar-style courses and a variety of co-curricular activities and outreach opportunities that emphasize the connections between modern culture and its historical roots.

Living and Learning Communities

Living and Learning Communities (LLCs) (<http://living.colorado.edu/get-involved/llcs>) also enhance the learning environment. Several communities offer themed housing without the formal connection to faculty found with the RAPs.

- **Active Living LLC** offers students in Darley North a living community in which all participants strive to lead an intentionally active lifestyle. Events in the program inspire the holistic development of mind, body and spirit. Ultimately, Active Living participants aim to achieve academic success and fulfillment of their personal needs and goals.
- **Lucile Berkeley Buchanan LLC** provides a supportive, social and communal space for black-identified students and their community allies. Students gain access to artifacts, critical conversation and educational programming that create an inclusive and productive atmosphere within the residence hall.

- **Multicultural Perspective LLC** is a community that provides a safe space for students to talk and learn more about social justice issues through conferences, events and dialogue. This program partners with the Spectrum Living & Learning Community.
- **The Quadrangle Engineering LLC** (<http://living.colorado.edu/get-involved/llcs-quad-engineering>) is comprised of students studying engineering, applied science or mathematics who live in Aden, Brackett, Cockerell or Crosman halls. This program offers residents on-site tutoring, access to a computer lab configured to match that in engineering computer labs, enhanced academic support services, wireless computer access and calculus work groups in residence. An additional fee of \$130 per academic year was charged in 2016–17 to cover support activities (fee is subject to change).
- **Spectrum LLC**, part of the Multicultural Perspective LLC, offers a variety of social and educational activities including leadership opportunities. Spectrum is designed to provide a supportive place for individuals of all sexual identities including gay, lesbian, bisexual, transgender and queer people and their allies. The Spectrum living area has gender-neutral bathrooms.
- **Transfer WEST LLC** (Welcoming Exceptional Students in Transition) is a unique social, academic and resource community just for transfer students. Participants have previously attended other universities or colleges but are new to CU. The program hosts various social events and activities as well as academic advisement and career-oriented programs geared to help transfer students be successful at CU Boulder.

First-Year Interest Groups

During the 2017-18 academic year, CU Boulder will introduce four first-year interest groups (<https://living.colorado.edu/get-involved/figs>), or FIGs. Two programs will live in Libby Hall (<https://living.colorado.edu/content/libby-hall>) and the other two will live in Kittredge Central Hall (<https://living.colorado.edu/content/kittredge-central-hall>). There are no additional fees associated with participating in this program. If you are interested in participating in one of our four FIGs, please select that FIG(s) as your housing preference in the housing application. All housing assignments are done on a first-come, first-assigned process and are based on space availability at the time of application completion. Please note, preferencing a FIG in your housing application does not guarantee that you will be assigned to a FIG.

What is a FIG?

A FIG is an academic community made up of no more than 25 students with similar academic interests who live together in the same residence hall and work closely with a faculty director. FIG students take three courses together during the first semester on campus. FIGs are particularly appropriate for students who are College of Arts & Science Open Option, or interested in exploring several academic disciplines. The courses are anchored in an academic theme and include:

- First Year Seminar (<http://www.colorado.edu/FYS>)
- Two other courses available to all FIG students that fulfill degree requirements and are complementary to the all of the FIG's themes

In addition to taking courses together, students will also participate in co-curricular programs with faculty and peer mentors such as field trips, guest speakers and group meals.

What are the benefits?

FIGs provide both structured and ad hoc mentoring and support from faculty and upper-division peers, as well as focused academic study in an area of interest. Additionally, they aim to develop a community of support as students transition to the CU Boulder academic environment by creating a residential hub where students with similar academic interests can form study groups and maintain a relationship with their faculty director throughout their first year, and potentially throughout their time at CU.

FIG topics and Corresponding First Year Seminars for Fall 2017

1. Approaching Sustainability Through the Arts
 - FYSM 1000: Creative Storytelling of Issues Surrounding Climate Change
2. Social Justice & Media
 - FYSM 1000: Ethics and Social Responsibility
3. Developing Sustainable Communities & Cultures
 - FYSM 1000: Building Sustainable Communities Through Design
4. Sustainability & Environmental Science
 - FYSM 1000: Toxins in our Environment

Students will select two additional courses from a list available to all FIG students prior to building their fall semester schedules.

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baker

Barlow, Lisa K (https://experts.colorado.edu/display/fisid_100137)
Senior Instructor; PhD, University of Colorado Boulder

Breed, Michael D (https://experts.colorado.edu/display/fisid_103631)
PhD, University of Kansas

Calvin, Inga E (https://experts.colorado.edu/display/fisid_143774)
Lecturer

Chapman, Andrew David (https://experts.colorado.edu/display/fisid_153016)
Lecturer

Didomenico, Randolph (https://experts.colorado.edu/display/fisid_100927)
Senior Instructor; PhD, University of Colorado Boulder

Forrest, Betsy Carroll (https://experts.colorado.edu/display/fisid_101645)
Lecturer; PhD, University of Colorado Boulder

Kaplan, Jules Gordon (https://experts.colorado.edu/display/fisid_106077)
Instructor; PhD, University of Colorado Boulder

Kearns, Carol A (https://experts.colorado.edu/display/fisid_100536)
Senior Instructor; PhD, University of Maryland College Park Campus

Louie, Donna Funghar (https://experts.colorado.edu/display/fisid_110827)
Instructor

Newberry, Patrick Thaxton (https://experts.colorado.edu/display/fisid_151925)

Lecturer; MA, University of Colorado Boulder

Oliveras, Diana (https://experts.colorado.edu/display/fisid_107967)

Instructor; PhD, University of New Mexico

Snyder, Douglas J (https://experts.colorado.edu/display/fisid_154903)

Instructor

Souder, Heidi L (https://experts.colorado.edu/display/fisid_151177)

Instructor; PhD, University of South Florida

Communication and Society

Ashcraft, Karen Lee (https://experts.colorado.edu/display/fisid_147453)

Professor; PhD, University of Colorado Boulder

Babicz, Martin Charles (https://experts.colorado.edu/display/fisid_147676)

Instructor

Cheval, Melinda Kiger (https://experts.colorado.edu/display/fisid_108537)

BS, West Virginia University

Gale, Kendra L (https://experts.colorado.edu/display/fisid_125578)

Instructor; PhD, University of Minnesota Twin Cities

Jamieson, Sara Reed (https://experts.colorado.edu/display/fisid_147773)

Instructor; PhD, University of New Mexico

Farrand

Anderman, Elizabeth (https://experts.colorado.edu/display/fisid_144257)

Instructor

Bartlett, Jamie Lynn (https://experts.colorado.edu/display/fisid_156740)

Lecturer

Chan, Steve S (https://experts.colorado.edu/display/fisid_102816)

Professor; PhD, University of Minnesota Twin Cities

Comstock, Cathy (https://experts.colorado.edu/display/fisid_101895)

Senior Instructor

Fischer, Katherine V (https://experts.colorado.edu/display/fisid_155474)

Lecturer

Fredricksmeier, Hardy (https://experts.colorado.edu/display/fisid_115446)

Senior Instructor

; PhD, University of Texas at Austin

Gillett, Bernard (https://experts.colorado.edu/display/fisid_102629)

Senior Instructor; MA, University of Colorado Boulder

Henningsen, Matthew Scott (https://experts.colorado.edu/display/fisid_156802)

Lecturer

King, D Brett (https://experts.colorado.edu/display/fisid_103815)

Instructor; PhD, Colorado State University

Kunce, Catherine (https://experts.colorado.edu/display/fisid_120631)

Senior Instructor; PhD, University of Denver

McGuire, Vincent X (https://experts.colorado.edu/display/fisid_100793)

Senior Instructor; PhD, University of Colorado Boulder

Simpson, Michele D (https://experts.colorado.edu/display/fisid_145311)

Instructor

Global

Conzelman, Caroline S (https://experts.colorado.edu/display/fisid_145356)

Instructor

; PhD, University of Colorado Boulder

Kanner, Michael David (https://experts.colorado.edu/display/fisid_100925)

Lecturer

Martin, Jessica Erin (https://experts.colorado.edu/display/fisid_143770)

Instructor; PhD, University of Colorado Boulder

Pieplow, Nathan D (https://experts.colorado.edu/display/fisid_131512)

MEd, University of Oregon

Romanov, Artemi (https://experts.colorado.edu/display/fisid_100659)

MA, SUNY at Binghamton

Toohey, Darin W (https://experts.colorado.edu/display/fisid_110652)

Professor; PhD, Harvard University

Global Engineering

Sieber, Diane Elizabeth (https://experts.colorado.edu/display/fisid_101394)

PhD, Princeton University

Health Professions

Brown, Matthew C (https://experts.colorado.edu/display/fisid_107370)

Instructor; PhD, University of Colorado Boulder

Gleeson, Todd T (https://experts.colorado.edu/display/fisid_105480)

Professor; PhD, University of California-Irvine

Oliveras, Diana (https://experts.colorado.edu/display/fisid_107967)

Instructor; PhD, University of New Mexico

Vigers, Alison Jane (https://experts.colorado.edu/display/fisid_142378)

Instructor

Honors

Bartlett, Jamie Lynn (https://experts.colorado.edu/display/fisid_156740)

Lecturer

Buchwald, Robert (https://experts.colorado.edu/display/fisid_148439)

Instructor; PhD, University of Colorado Boulder

Dike, Steven (https://experts.colorado.edu/display/fisid_149880)

Instructor; MA, University of Virginia Central office

Fischer, Katherine V (https://experts.colorado.edu/display/fisid_155474)

Lecturer

Gerland, Oliver W (https://experts.colorado.edu/display/fisid_101092)

Associate Professor; PhD, Stanford University

Libby Arts

Alpern, Tyler J (https://experts.colorado.edu/display/fisid_115381)

Senior Instructor

Auvinen, Karen Marie (https://experts.colorado.edu/display/fisid_106065)
Instructor

Babicz, Martin Charles (https://experts.colorado.edu/display/fisid_147676)
Instructor

Bernardini, Giulia (https://experts.colorado.edu/display/fisid_143777)
Instructor

Broersma, Leslee (https://experts.colorado.edu/display/fisid_112749)
Senior Instructor; MFA, University of Colorado Boulder

Chapman, Andrew David (https://experts.colorado.edu/display/fisid_153016)
Lecturer

Fischer, Katherine V (https://experts.colorado.edu/display/fisid_155474)
Lecturer

Louie, Donna Funghar (https://experts.colorado.edu/display/fisid_110827)
Instructor

Lundy, Tiel Louise (https://experts.colorado.edu/display/fisid_151085)
Instructor; PhD, University of Denver

Pang, Cecilia J (https://experts.colorado.edu/display/fisid_129479)
PhD, University of California-Berkeley

Robinson, Janet Schwartzberg (https://experts.colorado.edu/display/fisid_124489)
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Sharma, Vijaya Raj (https://experts.colorado.edu/display/fisid_104623)
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Stade, Eric (https://experts.colorado.edu/display/fisid_100456)
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Calvin, Inga E (https://experts.colorado.edu/display/fisid_143774)
Lecturer

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Senior Instructor; PhD, University of Illinois at Urbana-Champaign

Stade, Eric (https://experts.colorado.edu/display/fisid_100456)
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Instructor

GRADUATE CATALOG

Graduate education at the University of Colorado began in 1892. In 1909, the Graduate School was organized with a separate faculty. The mission of the Graduate School is to facilitate and enhance the educational experiences of all graduate students and to guarantee a standard of quality and cohesion across all disciplines, ensuring the continuing integrity and value of a CU Boulder graduate degree. Currently overseeing over 120 graduate programs, the Graduate School is responsible for planning, implementing, and evaluating graduate programs and graduate education policies and procedures.

The Graduate School along with the Graduate Faculty develops and administers programs according to the needs of the campus and in accord with the general standards of excellence and sound academic administration established by the Graduate School and the Graduate School Rules (http://www.colorado.edu/GraduateSchool/policies/_docs/GraduateSchoolRules.pdf). Academic policies governing graduate education are initiated by the faculty in accordance with the Laws of the Board of Regents. The Graduate School Executive Advisory Council, which consists of members of the Graduate Faculty, advises the Dean of the Graduate School and Vice Provost for Graduate Affairs on issues concerning Graduate School policies and programs. The Dean of the Graduate School and Vice Provost for Graduate Affairs reports to the Provost.

The Dean of the Graduate School and Vice Provost for Graduate Affairs also oversees a variety of centers and programs that are not affiliated with any single college. These include the Center for Humanities and the Arts, the Center for STEM Learning, the Center for Native American and Indigenous Studies, the Center for the Study of Origins, and the Program in Environmental Design. The Graduate Teacher Program is a division of the Graduate School.

Admissions

Graduate School admission is handled by individual academic departments; see the specific college, school and program sections for details. For more information, visit Graduate School Admissions (<http://www.colorado.edu/graduateschool/admissions>).

Application Procedures

Students seeking admission to a CU Boulder master's or doctoral program apply directly to the appropriate department. An applicant for admission must present complete application materials that include:

1. The graduate application, available online at Graduate School Admissions (<http://www.colorado.edu/graduateschool/admissions>).
2. Unofficial transcripts for all academic work completed to date.
3. A non-refundable application fee. The fee is currently \$60 for domestic applicants and \$80 for international applicants.
4. Three or four letters of recommendation. Please check with your program to obtain the required number of recommendations needed.
5. Test scores and other materials as required by specific departments.

A completed application must be submitted by the published deadline for the term for which admission is sought. Most departments have an application deadline that is several months before the start of the desired admission term.

Admission Requirements

Regular Degree Students

Qualified students may be recommended for admission to regular degree status by approved programs of the Graduate School provided they meet the following criteria:

1. They hold a baccalaureate degree from an accredited college or university or have done work equivalent to that required for such a degree.
2. They show promise of ability to pursue advanced study and research, as judged by their scholastic record.
3. They have had adequate preparation to enter graduate study in the chosen field.
4. They have at least a 2.75 (on a 4.00 scale) undergraduate GPA (for engineering, 3.00). (Note: Applicants who cannot meet criterion 4 may still secure regular admission if they have completed 9 credit hours of relevant graduate course work with at least a 3.25 average.)
5. They meet additional requirements for admission established by the major department.

Provisional Degree Students

Students who do not meet the requirements for admission as regular degree students may be recommended for provisional degree status by their major department. With the concurrence of the dean of the Graduate School, these students are admitted for a probationary term of either one or two semesters of full-time study (or the equivalent for part-time students). At the end of the specified probationary period, provisional degree students must be either admitted to regular degree status or dismissed from the graduate program. Provisional students are subject to the same standards of performance required of regular degree students, plus any other requirements imposed by the program faculty as conditions of admission.

Credit hours earned by persons in provisional degree status may count toward a degree at CU Boulder.

To meet the standard terms of provisional admission, the student must generally complete 12 credit hours in two semesters (or equivalent for part-time students) with a 3.00 cumulative GPA. Program faculty may recommend additional or alternative conditions as appropriate.

Concurrent Bachelor's/Master's Degree Program

A number of CU Boulder departments offer concurrent bachelor's/master's degrees, which enable CU undergraduate students to pursue undergraduate and graduate programs simultaneously and to receive both degrees in a shorter time period than it would take to pursue them separately.

Highly qualified undergraduate students may be recommended for admission to a concurrent bachelor's/master's degree program at the end of their sophomore year or the beginning of their junior year. Such students are not formally admitted to the Graduate School. Standards for admission as well as eligibility to remain in the program are specified by each department.

Dual Degree Program

The Graduate School, in conjunction with the faculty of each department and the deans of schools and colleges where appropriate, approves dual degree programs that combine previously approved graduate degree programs in two areas or departments.

Qualified graduate students may be recommended for admission to an approved dual degree program upon meeting the qualifications of each graduate program and any special qualifications as outlined by each program's approved guidelines. Minimum standards and qualifications for admission and continuation are specified by each department. Students wishing to complete degrees in more than one department that have no approved dual degree program or interdisciplinary major combination must complete all the requirements for both degrees with no shared or overlapping course work.

Nondegree Students to Regular Degree Status

Students with nondegree status applying to a graduate degree program must complete their application for admission before completing 9 credit hours as nondegree students at CU Boulder.

Former and Suspended Students

Students who were previously admitted to a graduate degree program but who did not complete that degree and who have not been continuously registered at CU Boulder must complete the following steps before being readmitted:

1. Clarify their status with the department to determine their eligibility to return and pursue the same degree.
2. Submit a Graduate Readmit application to the department (departmental approval is required) before enrollment levels are met or deadlines passed for the term in which they expect to return to CU Boulder.

A regular degree student who is dismissed for failure to maintain a 3.00 grade point average is eligible to apply for readmission after one year. Approval or rejection of this application rests jointly with the student's major department and the dean of the Graduate School. The final decision will be made by the dean based on the recommendations of the department.

Students Transferring from Other CU Campuses

Students transferring from another CU campus to CU Boulder must apply to and be accepted by the Boulder campus.

Students Changing Major Departments

Students who want to change major departments must apply to and be accepted by the new department. When adding a second major in an approved interdisciplinary major combination, students should contact their home department for instructions on this process.

Faculty Members

No member of the faculty above the rank of instructor may be working toward an advanced degree from CU Boulder.

Academic Standards & Advising

Academic Standards

Grade Point Average

A student is required to maintain at least a B (3.00) average in all work attempted while enrolled in the Graduate School, and must have at least a 3.00 cumulative average to receive a graduate degree.

Nonacceptable Grades

1. A student who receives a grade of C or below in a course may petition to repeat that course once, provided the course has not been previously applied toward a degree.
2. Courses in which grades below B- (2.70) are received are not accepted for doctoral programs.
3. Courses in which grades below C (2.00) are received are not accepted for master's degree programs or for the removal of academic deficiencies.
4. Courses taken toward the fulfillment of requirements for graduate degrees may not be taken pass/fail.

Student Ethics

Students are expected to adhere to the highest codes of personal and professional ethics. Students who do not adhere to written guidelines regarding academic honesty and/or academic or research ethics may be dealt with according to the appropriate policy documents. Students found guilty of misconduct in any of these areas may have sanctions imposed, or may be dismissed from CU Boulder.

Probation

A student whose cumulative GPA falls below 3.00 is placed on academic probation. The student generally has two semesters in which to raise the cumulative GPA to 3.00 or above. If the student's cumulative GPA is at or below 2.50, a dean's administrative stop is placed on the student's record, and the student may be withdrawn from course work for upcoming semesters. Individual departments may have specific probation requirements.

If, after the two-semester probationary period, the student's cumulative GPA is still below 3.00 or if other conditions placed by the major department or Graduate School are not met, a dean's administrative stop will be placed on the student's record and he or she may be subject to dismissal.

A provisionally admitted student whose GPA falls below 3.00 has a dean's administrative stop placed on his or her record pending a review by the major department and the Graduate School.

Graduate School Advising

Graduate students receive degree specific advising from their academic department. Faculty advisors are assigned to students according to departmental policies.

The Graduate School provides information and guidance to students, staff, and faculty on many issues. These may include general Graduate School rules and policies, registration requirements, committee and general examination requirements, general academic standards, degree requirements which apply to all students, and exceptions to general requirements.

The Graduate Student Services office can advise students regarding graduation requirements, deadlines, and degree conferral, and provides information and advice on other issues at the Dean's Office level.

For general inquiries, contact Graduate Student Services at gradinfo@colorado.edu or call 303-492-8220.

Degree Requirements

Master's Degree Requirements

A student enrolled in a master's program must satisfy the degree requirements of both the Graduate School and the major department. The requirements listed below are the minimum standards of the Graduate School; additional requirements are set forth by the major department.

A graduate student is responsible for becoming informed about and observing all regulations and procedures required by the graduate program pursued. Ignorance of a rule does not constitute a basis for waiving that rule. Any exceptions to the policies stated in this catalog must be approved by the Dean of the Graduate School.

Minimum Registration Requirement

Master's degree minimum registration requirements can be met only by full-time registration at CU Boulder for at least two semesters, at least three summer sessions or a combination of at least one semester and two summer sessions/part-time semesters.

For purposes of deciding minimum registration credit hours toward a graduate degree, a student must be registered as a full-time student. One semester of minimum registration credit hours may be earned for full-time registration during the fall or spring semesters or two summer semesters/part-time semesters.

To be a full-time master's student, a student must carry one of the following course loads: a minimum of 5 credit hours of graduate course work, 8 credit hours of combined undergraduate and graduate course work, 12 credit hours of undergraduate course work, at least 1 master's thesis credit hour or at least 1 credit hour of "Master's Candidate for Degree." Full- and half-time standards may be different for students receiving federal or state financial aid. Students should contact the Office of Financial Aid to see if these standards apply. These different standards are for financial aid purposes only.

Degree Requirements

The minimum requirement for the master's degree is 30 credit hours. A student may complete a Plan I (thesis) option, or a Plan II (course work) option. At least 24 credit hours must be completed at the 5000 level or above; these 24 credit hours must include a minimum of 4, but not more than 6, thesis credit hours for those students completing a Plan I degree. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the academic department.

Independent study course work cannot exceed 25 percent of the course work required for the master's degree.

Language Requirement

There is no campuswide foreign language requirement for the master's degree. The decision regarding the foreign language requirement for each graduate degree is the responsibility of the graduate program.

Master's Thesis

A thesis, which may be research or expository, critical or creative work, is required of every master's degree candidate under Plan I. Every thesis presented in partial fulfillment of the requirements for an advanced degree must accomplish the following:

- represent the equivalent of 4–6 credit hours of work, and
- comply in mechanical features with the specifications for theses and dissertations available in the Graduate School.

The final grade is withheld until the thesis is completed; if the thesis is not finished at the end of the term in which the student is registered, an in-progress (IP) grade is reported.

Candidacy and Graduation

To be granted a master's degree, a student must become a candidate for that degree by filing an Application for Admission to Candidacy with the Graduate School no later than the posted graduation deadlines during the semester in which he or she plans to have the degree conferred. Students must meet all posted graduation deadlines in order to receive a degree in any given semester.

Time Limit

Master's degree students have four years (six years for students pursuing an ME) from the semester in which they are admitted and begin course work to complete all degree requirements. The phrase "all degree requirements" includes the filing of the thesis with the Graduate School if Plan I is followed. Students who fail to complete the degree in this four-year period may be dismissed from their program with the concurrence of the major advisor and/or appropriate departmental personnel. To continue, the student must file a petition for an extension of the time limit with the dean of the Graduate School. Such petitions must be endorsed by the student's major advisor and/or other appropriate departmental personnel and may be granted for up to one year.

Students who have not completed the degree within their time limit, and who have received approval for an extension, must have any course work completed more than five years prior to the completion of the degree requirements evaluated by their department for relevance and applicability. At the discretion of the department the student may be required to validate these courses as part of the completion of their degree requirements.

Students who need to leave CU Boulder for a period of time may apply for a graduate leave of absence for up to one year. Taking a leave of absence does not extend the student's time limit, but may be used as a reason to request an extension.

Students whose registration at CU Boulder is interrupted by military service may apply to the dean of the Graduate School for an extension.

Comprehensive-Final Examination

Each candidate for a master's degree is required to take a comprehensive-final examination/thesis defense after the requirements for the degree have been substantially completed or to present an approved degree plan which meets the requirements of the field and represents an intellectually coherent graduate education as determined by the major department. The examination/defense may be given near the end of the student's last semester while the candidate is still taking required courses for the degree, provided satisfactory progress is being made in those courses. For students pursuing a Degree Plan Approval option, a final exam is not required. The approved degree plan must be approved by the department chair, graduate director and major advisor on the Degree Plan Approval Form. The Degree Plan Approval option is available only in select departments.

The following rules apply to the comprehensive-final examination:

1. A student must be registered on the Boulder campus as a regular degree-seeking student during the semester the examination is passed.

2. Notice of the examination/defense must be filed by the major department in the Graduate School at least two weeks prior to the examination/defense. The examination/defense must be scheduled no later than the posted deadline for the semester in which the degree is to be conferred.
3. The exam is given by a committee of three graduate faculty members appointed by the department with approval of the dean of the Graduate School. The chair of the committee must have a regular or tenured graduate faculty appointment.
4. The examination, which may be oral, written or both, must cover the thesis (which should be essentially complete), other work completed in courses and seminars in the major field and all work presented for the degree.
5. A student must have an affirmative vote from the majority of the committee members to pass. A student who fails the comprehensive final examination may attempt it once more after a period of time determined by the examining committee.

Graduate Faculty Appointments for Courses and Exams

All courses, 5000-level or above, completed to fulfill graduate degree requirements must be taught by members of the graduate faculty. In addition, any faculty member serving on a master's or doctoral examination/defense committee must hold a current graduate faculty appointment. Membership on the university faculty does not automatically constitute an appointment to the graduate faculty. Contact your departmental graduate program assistant for questions concerning these appointments.

Doctoral Degree Requirements

The Doctor of Philosophy (PhD), Doctor of Musical Arts (DMusA) and Doctor of Audiology (AuD) are the highest academic degrees conferred by CU Boulder. The requirements stated below are minimal requirements for all candidates for the PhD degree; additional conditions are found in department announcements. Additional requirements for the Doctor of Musical Arts (p. 1336) are available from the College of Music. Additional requirements for the Doctor of Audiology (p. 1099) are available from the Department of Speech, Language and Hearing Sciences.

A graduate student is responsible for becoming informed about and observing all regulations and procedures required by the graduate program pursued. Ignorance of a rule does not constitute a basis for waiving that rule. Any exceptions to the policies stated in this catalog must be approved by the dean of the Graduate School.

Admission

If a student is admitted to a master's program and wants to continue on to a doctoral program in the same department, they should consult their home department on the proper procedure.

Minimum Registration Requirement

The minimum registration requirement for doctoral students is six semesters beyond the attainment of an acceptable bachelor's degree. Two semesters of minimum registration credit hours may be allowed for a master's degree from an accredited institution; however, at least four semesters of minimum registration credit hours, two of which must be consecutive in one academic year, must be earned for work taken at CU Boulder.

For purposes of deciding minimum registration credit hours toward a graduate degree, a student must be registered as a full-time student. One semester of minimum registration credit hours may be earned for full-time registration during the fall or spring semester or during two summer semesters. Doctoral students who have not passed the comprehensive examination are considered full time during the spring and fall semesters if they are enrolled for at least 5 credit hours of course work at the graduate level, 8 credit hours of combined undergraduate and graduate credit hours, 12 credit hours of course work at the undergraduate level or at least 1 doctoral dissertation credit hour. DMA students who have not passed their comprehensive exam may also be considered full time if they are taking 1 credit hour of course work numbered 8200–8399 or TMUS 8019. Doctoral students who have passed the comprehensive examination must register for at least 5 doctoral dissertation credit hours to be considered full-time students. DMA students who have passed their comprehensive examination must register for 1 credit hour of course work numbered 8200–8399 or TMUS 8029 to be considered full time. Doctor of audiology students are considered full-time students if they are enrolled for at least 5 credit hours of course work at the graduate level, 8 credit hours of course work of combined undergraduate and graduate credit hours or 12 credit hours of course work at the undergraduate level. Full- and half-time standards may be different for students receiving federal or state financial aid. Students should contact the Office of Financial Aid to see if these standards apply. These different standards are for financial aid purposes only.

Degree Requirements

The minimum requirements for the PhD or DMusA degree are 30 credit hours of course work at the 5000 level or above. Those students pursuing the PhD shall complete a minimum of 30 credit hours of dissertation work beyond the minimum course work requirement. The minimum requirements for the AuD degree are 97 credit hours of course work at the 5000 level or above.

Unless otherwise specified by departmental requirements, all courses taken at the 5000 level or above that were taken for the master's degree at CU Boulder may be applied toward the PhD degree. Course work taken in pursuit of a doctoral degree cannot be applied toward a subsequent master's degree.

Preliminary Examination

Each department determines for itself (by examination or other means) that students who wish to study for the doctoral degree are qualified. The means by which each department makes this evaluation are specified in departmental requirements. Students who are thus evaluated are notified immediately of the results.

Language Requirement

There is no campuswide foreign language requirement for the doctoral degree. The decision regarding the foreign language requirement for each graduate degree is the responsibility of the graduate program.

Dissertation Credit-Hour Requirement

To complete the requirements for the PhD degree, a student must register for a minimum of 30 dissertation credit hours. Distribution of those credit hours is as follows:

1. A student may not register for more than 10 dissertation credit hours in any one semester.

2. Not more than 10 dissertation credit hours taken in semesters prior to the semester in which the comprehensive examination is passed may be counted in the 30 dissertation credit hours required for the degree.
3. Not more than 10 dissertation credit hours taken the semester in which the comprehensive examination is passed may be included in the 30 dissertation credit hours required for the degree.

Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination in the field of concentration and related fields.

The following rules apply to the doctoral comprehensive examination.

1. Students must be registered (pass/fail or credit) on the Boulder campus as regular degree-seeking students when they pass the comprehensive examination.
2. Notice of the examination must be filed by the major department with the Graduate School at least two weeks before the examination.
3. The examination is conducted by an examining board appointed by the chair of the major department and approved by the dean of the Graduate School. The board consists of the major advisor and additional members as necessary to a minimum of five. The chair must have a regular or tenured graduate faculty appointment. Successful candidates must receive affirmative votes from a majority of the members of their examination board. A candidate who fails the examination may attempt it once more after a period of time determined by the examination board.
4. The examination, which may be oral, written or both, tests mastery of a broad field of knowledge, not merely formal course work. The oral part is open to members of the graduate faculty.

Admission to Candidacy

A student must formally apply for admission to candidacy for the doctoral degree on forms supplied by the Graduate School upon passing the comprehensive examination. Before being admitted to candidacy a student must earn at least three semesters toward the minimum registration requirement, and pass the comprehensive examination.

Graduation

Students must meet all posted graduation deadlines in order to receive a degree in any given semester.

Continuous Registration Requirement

A PhD student is required to register continuously for a minimum of 5 dissertation credit hours in the fall and spring semesters of each year, beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the dissertation is successfully defended (final examination). DMusA students must maintain continuous registration for at least 1 credit hour of course work numbered 8200–8399 (or TMUS 8029). AuD students must maintain continuous registration for appropriate course work in the fall and spring semesters of each year through the semester in which the final exam is passed.

1. A student not required to maintain full-time status and not using campus facilities may claim off-campus status, which allows registration for 3 rather than the minimum of 5 dissertation credit hours. Off-campus status (3 credit hours of dissertation) is

considered part-time. All CU Boulder considerations for part-time status apply.

2. A student who fails to register continuously for dissertation credit hours after passing the comprehensive examination must retake and pass the comprehensive examination in order to regain status as a student in good standing in the Graduate School. The department may require that the student validate course work more than five years old. At its discretion, the department may petition the dean of the Graduate School for a time limit for completion of all degree requirements of up to one year after the retaking of the comprehensive exam. The department must petition the dean of the Graduate School to waive the requirement to retake the comprehensive exam.
3. A PhD student must be registered full time for a minimum of 5 dissertation credit hours during the semester (including summer session) in which the dissertation defense is passed. DMusA students must be registered full time in course work numbered 8200–8399 (or TMUS 8029) during the semester in which the dissertation defense is passed. AuD students must be registered full time for 5 credit hours of graduate level course work or 8 credit hours of combined undergraduate and graduate credit hours during the semester in which the final exam is passed.

Time Limit

Doctoral degree students are expected to complete all degree requirements within six years from the semester in which they are admitted and begin course work in the doctoral program. The phrase "all degree requirements" includes the filing of the dissertation and all accompanying forms with the Graduate School. Students who fail to complete the degree in this six-year period may be dismissed from their program with the concurrence of the major advisor and/or appropriate departmental personnel. To continue, the student must file a petition for an extension of the time limit with the dean of the Graduate School. Such petitions must be endorsed by the student's major advisor and/or other appropriate departmental personnel and may be granted for up to one year. If the dean of the Graduate School and the department chair/program director cannot agree on whether a student should continue, the Graduate School's executive advisory council makes the final decision.

Students who need to leave CU Boulder for a period of time may apply for a graduate leave of absence for up to one year. Doctoral students who are required to maintain continuous registration may petition for an exception in order to take a leave of absence due to extenuating circumstances. Requests for leave of absence for parental leave do not require a petition. Taking a leave of absence does not extend the student's time limit, but may be used as a reason if applying for an extension.

Students whose registration at CU Boulder is interrupted by military service may apply to the dean of the Graduate School for an extension of time.

Dissertation Defense/Final Exam

After the PhD dissertation has been accepted for defense by the student's committee, a final examination on the dissertation and related topics is conducted. For DMA and AuD students, a final examination is conducted in place of the dissertation defense.

The following rules apply to the dissertation defense.

1. A student must be registered as a full-time, regular, degree-seeking student at CU Boulder for a minimum of 5 dissertation credit hours during the semester in which the final examination is passed. DMusA students must be registered full time in course work numbered 8200–8399 (or TMUS 8029) during the semester in which the dissertation defense is passed. Doctor of audiology students should be registered during the final exam for 5 credit hours of course work at the graduate level or 8 credit hours of combined undergraduate and graduate credit hours.
2. Students must notify the Graduate School of their final oral examination at least two weeks before their scheduled examination date.
3. This examination is wholly or partly oral, the oral part being open to anyone.
4. The examination is conducted by a committee appointed by the chair of the major department and approved by the dean of the Graduate School, which consists of at least five persons, one of whom must be from outside the student's major department. Three of the members must be CU Boulder graduate faculty. The chair and outside member of the committee must have regular or tenured graduate faculty appointments. The other committee members must have either regular or special graduate faculty appointments. The chair and a majority of the committee must be present on the Boulder campus for the examination. More than one dissenting vote disqualifies the candidate in the final examination.
5. A student who fails the examination may attempt it once more after a period of time determined by the examining committee.

Dissertation Requirements

A PhD student must write a dissertation based upon original investigation, showing mature scholarship and critical judgment, as well as familiarity with tools and methods of research. The subject must be approved by the student's major department.

1. Every dissertation presented in partial fulfillment of the requirements for an advanced degree must represent the equivalent of at least 30 credit hours of work.
2. The student is responsible for notifying the Graduate School of the exact title of the dissertation on or before the posted deadlines during the semester in which the doctoral degree is to be conferred.
3. The dissertation must comply in mechanical features with the specifications for theses and dissertations available in the Graduate School.
4. After the dissertation defense, the student is responsible for submitting the dissertation and signature page on or before the posted deadline during the semester in which the doctoral degree is to be conferred.

The final grade is withheld until the dissertation is completed. In progress (IP) grades are assigned during each semester until the defense is successfully completed and the final copy of the dissertation is accepted by the examination committee, at which time the final grade for all dissertation credit hours is submitted to the Graduate School.

Sequestration of Dissertations

Dissertations approved by the departments and the Graduate School are released to ProQuest/UMI and kept on file electronically at Norlin Library.

Occasionally, the primary academic advisor, after consultation with the student, may find it necessary to sequester the student's dissertation to protect university rights to intellectual property. The university accepts

the obligation to protect potentially publishable creative works and potentially patentable subject matter from premature public disclosure so as to preserve entitlement to patent protection while the technology is being evaluated. This sequestration should take place only when it is absolutely required and only for the minimum time necessary.

With just cause, the student may request that an embargo be placed on the publication/sale of the thesis for a reasonable amount of time. This request is made upon the electronic submission of the document.

Graduate Faculty Appointments for Courses and Exams

All courses, 5000 level or above, completed to fulfill graduate degree requirements must be taught by members of the graduate faculty. In addition, any faculty member serving on a master's or doctoral examination/defense committee must hold a current graduate faculty appointment. Membership on the university faculty does not automatically constitute an appointment to the graduate faculty. Contact the departmental graduate program assistant for questions concerning these appointments.

Distance Education

Distance Education

The University of Colorado Boulder offers master's degrees, graduate certificates, and individual graduate courses online in several disciplines, including:

- Aerospace Engineering Sciences
- Civil Engineering
- Computer Science
- Electrical, Computer, and Energy Engineering
- Engineering Management
- Interdisciplinary Telecom
- Education
- Applied Shakespeare

CU Boulder's distance technology enables online students to participate live in actual campus courses from afar or to take courses according to their own schedules. A virtual library of over 100 previously recorded graduate courses are accessible for students to take for academic credit with the professor's permission.

Students may enroll in a single course, in a graduate certificate, or in a full master's degree program. Students applying for admission to a degree program may enroll in courses before being accepted, but should apply for admission before finishing a third course. Courses taken before admission are considered transfer credit. A maximum of nine hours of transfer credit will be accepted toward degree requirements once a student is admitted into that program.

For more information, visit the Graduate School (<http://www.colorado.edu/graduateschool>) website, call 303-492-6331 or email cugrad@colorado.edu.

Enrollment & Records

Degrees

Graduate Degrees

The Graduate School of the University of Colorado Boulder offers instruction leading to the following advanced degrees:

- Master of Arts (MA)
- Master of Business Administration (MBA) (through Leeds School of Business)
- Master of Engineering (ME)
- Master of the Environment (MENV)
- Master of Fine Arts (MFA)
- Master of Music (MMus)
- Master of Music Education (MMEd)
- Master of Science (MS)
 - Professional Master of Science in Aerospace Engineering Sciences (MSAES)
 - Professional Master of Science in Civil Engineering (MSCVE)
 - Professional Master of Science in Computer Science (MSCPS)
 - Professional Master of Science in Electrical Engineering (MSEE)
 - Professional Master of Science in Environmental Engineering (MSENV)
 - Professional Master of Science in Mechanical Engineering (MSME)
- Master of Studies in Law (MSL) (through School of Law)
- Doctor of Audiology (AudD)
- Doctor of Musical Arts (DMA)
- Doctor of Philosophy (PhD)
- Juris Doctorate (JD) (through School of Law)

Concurrent Degrees

Concurrent BS/MS, BA/MA, and BA/MS degree programs are offered in several departments. These programs allow a student to receive both a bachelor's and master's degree in five years of study without compromising the academic integrity of either degree.

College of Arts and Sciences

Currently approved concurrent degree programs in the College of Arts and Sciences are offered in:

- Art and Art History
- Chinese/Asian Languages and Civilizations
- Classics
- Ecology and Evolutionary Biology
- Ethnic Studies/Education
- Film Studies/Art History
- French
- German Studies
- Integrative Physiology
- Japanese/Asian Languages and Civilizations
- Linguistics
- Mathematics
- Mathematics/Applied Mathematics
- Physics
- Psychology (cognitive)
- Religious Studies

- Russian Studies
- Theatre

Leeds School of Business

Currently approved concurrent degree programs:

- Accounting
- Finance/Accounting
- Management/Telecommunications

School of Education

Currently approved concurrent degree programs:

- Ethnic Studies/Education

College of Engineering and Applied Science

Currently approved concurrent degree programs:

- Aerospace Engineering
- Applied Mathematics
- Applied Mathematics/Telecommunications
- Architectural Engineering
- Architectural Engineering/Civil Engineering
- Chemical Engineering
- Chemical and Biological Engineering/Chemical Engineering
- Civil Engineering
- Civil Engineering/Architectural Engineering
- Computer Science
- Computer Science/Telecommunications
- Electrical Engineering
- Electrical and Computer Engineering/Electrical Engineering
- Electrical and Computer Engineering/Telecommunications
- Engineering Physics/Physics
- Environmental Engineering/Civil Engineering
- Management/Telecommunications
- Mechanical Engineering

These concurrent degree programs are open only to highly qualified CU Boulder undergraduates. Students are formally admitted at the end of their sophomore year or the beginning of their junior year. They are admitted through the admission procedure of their department and do not go through the normal process of admission to Graduate School. When students have completed the program requirements, they receive both a bachelor's and a master's degree simultaneously. Students wishing to continue studying toward a doctorate must formally apply for admission to the Graduate School. Students interested in a concurrent bachelor's/master's program should inquire in the department.

Dual Degrees

In an environment where there is a rapidly increasing desire for interdisciplinary and professional skills, receiving two master's degrees in complementary fields can be a real asset. Contact the individual departments for details.

Combinations within the Graduate School

- Applied Math/MCD Biology
- Audiology/Speech, Language and Hearing Sciences (both through the Department of SLHS)
- Engineering Management/Aerospace Engineering

- Engineering Management/Computer Science
- Engineering Management/Electrical Engineering
- Engineering Management/Mechanical Engineering
- Engineering Management/Telecommunications
- Music (two areas)
- Religious Studies/Asian Languages/History (any two)

Combinations with MBA

- Anthropology/MBA
- Art and Art History/MBA
- Computer Science/MBA
- Environmental Studies/MBA
- German Studies/MBA
- Telecommunications/MBA
- Theatre/MBA

Combinations with Law

- Business Administration/Law
- Environmental Studies/Law
- Juris Doctor/Bachelor of Laws with the University of Alberta faculty of Law, Canada
- Medicine/Law
- Public Administration/Law
- Telecommunications/Law
- Urban and Regional Planning/Law

Certificates

Graduate students may pursue formal certificates in a variety of academic or interdisciplinary subjects. Each certificate program has unique requirements. Degree-seeking students who have been verified to have completed certificate requirements will have the certificate/s posted to their academic records at the time of graduation. Non-degree students who are approved to pursue select certificate programs must be admitted through Continuing Education.

Registration

New Students

Registration procedures are sent to new graduate students when they confirm their intent to enroll. Please see the university's Registration & Enrollment (p. 20) section.

Late registration is held only if enrollment levels have not been reached. Graduate students (including candidates for degrees and students taking only thesis credit hours) who fail to complete registration and pay fees during regular registration may be charged a late registration fee.

Intercampus Registration

Boulder campus students unable to obtain courses required for their degree program on the Boulder campus may register for up to two courses or 6 credit hours, whichever is greater, on another University of Colorado campus. The course work must be required for their degree program; they must have their dean's permission; they must be enrolled for at least one course on the Boulder campus; and enrollment levels must not have been reached on the other campus. Contact the Office of the Registrar for additional information.

Reciprocal Exchange Agreement Program

Reciprocal registration enables University of Colorado graduate students to attend classes at other Colorado institutions, including Colorado School of Mines, Colorado State University and the University of Northern Colorado. For more information, contact the Office of the Registrar.

Withdrawal

Please see the university's Registration & Enrollment (p. 22) section.

Graduate Course Load

For financial aid full time and half time course-load requirements, which are different than those set by the Graduate School, graduate students should consult the Office of Financial Aid (<http://www.colorado.edu/financialaid>) website.

For enrollment verification and academic purposes, full-time status is determined by university policy. Typically in the fall and spring semesters, full time status is: 5 credit hours of graduate course work, 8 credit hours of combined graduate/undergraduate course work, 12 credit hours of undergraduate course work or a varying number of thesis/dissertation credit hours, depending upon the student's status. Summer course load requirements vary. For requirements, visit the Graduate School (<http://www.colorado.edu/GraduateSchool>) website.

Graduate students may register for a maximum of 15 credit hours per semester toward a degree during the fall and spring semesters.

Credit Policies

No Credit

Course work to be applied toward an advanced degree may not be taken for no credit (NC). Courses taken for no credit cannot be used toward the minimum credit load requirement for full-time or half-time status.

Pass/Fail

No course work to be applied toward an advanced degree may be taken pass/fail.

Transfer Credit

Transfer credits from accredited institutions are accepted by CU Boulder only after approval by the department chair/program director and the dean of the Graduate School, and under conditions outlined below. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system or credits earned as a nondegree student within the CU system. Students seeking a degree from CU Boulder must complete the majority of their course work while enrolled as degree-seeking students.

The following rules apply to transferring credit to CU Boulder graduate programs:

- The maximum amount of work that may be transferred to CU Boulder depends upon the graduate degree sought (see below; individual departments may have more restrictive limits).
- Work already applied toward a graduate degree received from CU Boulder or another institution cannot be accepted for transfer toward another graduate degree of the same level at CU Boulder. In addition, work completed for a doctoral degree may not be applied toward a subsequent master's degree. Extension work completed at another institution cannot be transferred, and correspondence work, except to make up deficiencies, is not recognized.

- All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer course work that is to be applied to a graduate degree at CU Boulder and was completed more than five years prior to being accepted to the program will be evaluated by the major department as to current relevance and applicability to the degree requirements. At the discretion of the department, a student may be asked to validate transfer credits prior to approval.
- Credit may not be transferred until the student has completed 6 credit hours of graduate course work as a regular, degree-seeking student at the Boulder campus with a 3.00 GPA. Transferred credits do not reduce the minimum registration requirement, but may reduce the amount of work to be done in formal courses.
- Excess undergraduate credits from another institution may not be transferred to the CU Boulder Graduate School.

Maximum Transfer Credits Accepted (By Degree)

MA, ME, MS, MMus or MMusEd	9
MFA	18
DMA, PhD, or AuD	21
AuD students with MA and audiology certification	30

Graduate Credit for CU Boulder Seniors

With the exception of students enrolled in a concurrent bachelor's/master's degree program, seniors at CU Boulder may earn graduate credit for a limited amount of graduate-level work (up to 9 credit hours), provided such work is completed with a grade of B or above in course work at CU Boulder; comes within the five-year course time limit; has not been applied toward another degree; and is recommended for transfer by the department concerned, and such transfer is approved by the dean of the Graduate School.

Student Finances

Expenses

Confirmation Deposit

All new students (in-state, out-of-state and international) must confirm their enrollment at the university by official notification and deposit of \$200. The deposit is nontransferable and must be paid by all students, regardless of financial aid awards. Students who have paid the deposit and who decide not to attend CU Boulder forfeit their deposit. Students who submit deposits after enrollment levels have been reached will not be accepted, and their deposits will be returned.

The confirmation deposit is not credited toward tuition and fees. It is refunded when a student graduates or officially withdraws from CU Boulder within established dates and guidelines after paying any outstanding university obligations. Students should update their direct deposit bank account information before they graduate or withdraw to be sure they receive their refund.

Estimated Expenses

Expenses for students attending the University of Colorado Boulder vary depending on program of study, state residency (tuition classification), personal needs and individual interests. The following estimates on the Bursar's Office website are based on 2017–18 rates:

University-billed Cost Estimates for Colorado Resident Graduate Students (<https://bursar.colorado.edu/tuition-fees/annual-cost-estimate/graduate-colorado-resident>)

University-billed Cost Estimates for Nonresident/International Graduate Students (<https://bursar.colorado.edu/tuition-fees/annual-cost-estimate/graduate-nonresident-international>)

Notes:

- Residency classification (<http://www.colorado.edu/registrar/students/state-residency>) for tuition is determined by Colorado state law.
- Does not include one-time new student fee or mandatory university-sponsored health insurance. See health insurance requirement (p. 24).
- For detailed descriptions of tuition and fees, visit the Bursar's Office (<https://bursar.colorado.edu/tuition-fees/tuition-and-fees-rate-sheets>) website.
- Students planning to attend summer session can visit the Bursar's Office (<https://bursar.colorado.edu/tuition-fees/tuition-and-fees-rate-sheets/#sum17>) website for summer rates.
- Zero or fractional credit is treated as one hour in assessing tuition and fees. Tuition for no-credit (NC) courses is the same as for courses taken for credit.
- Students simultaneously enrolled in programs leading to two different degrees will be assessed tuition for the college or school with the higher tuition rate.

Additional costs such as transportation, medical and personal are not charged on the university bill but should be considered for planning purposes. The Office of Financial Aid provides budget examples (<http://www.colorado.edu/financialaid/cost/example-aid>) which may help you plan for other costs.

Tuition and fees are approved annually by the Board of Regents. Visit the Bursar's Office (<https://bursar.colorado.edu>) website for current rates.

Online Bills

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://bursar.colorado.edu/payments/payment-policies/tuition-fee-agreement-and-disclosure>).

The university bill includes tuition, mandatory fees, course and program fees, optional fees, student health insurance (see health insurance requirement (p. 24)) and other direct-university costs for one semester at a time. Textbooks and supplies up to \$1,500 from the CU Book Store can be charged to the bill. Adjustments made throughout the semester will appear immediately on the student account (e.g. health insurance waiver, dropping or adding courses, etc.). Additional costs such as transportation, medical and personal are not charged on the university bill but should be considered for planning purposes.

Bills for fall are available in mid-August. Spring bills are available in mid-January. Emails are sent to students' colorado.edu addresses and to authorized payers. Email is the official means of communication at CU Boulder. Failure to receive an email notification of the bill does not relieve any student of responsibility for payment by the published deadline. Students and authorized payers can log in to MyCUInfo (<https://mycuinfo.colorado.edu>) and CUBill&Pay (<https://quikpayasp.com/cu/boulder/tuition/authorized.do>) at anytime to view and pay the bill.

Authorized Payers

Bills are online only. Students access the bill through MyCUInfo. Family members (spouses, parents, etc.) do not automatically have access to see the bill due to federal privacy laws (<http://www.colorado.edu/registrar/students/records/ferpa>). Students must authorize payers (<https://bursar.colorado.edu/billing/cubillpay/parents>) in order to provide them with access to view and pay the bill. Students can authorize up to five people. Authorized payers access the bill through CUBill&Pay. Students are ultimately responsible for payment of the bill.

Authorized Payer access is separate and distinct from CU Guest Access. If someone is helping pay tuition and fees on your behalf, we recommend granting both.

Payments

Payment due dates are listed on the bill and on the Bursar's Office (<https://bursar.colorado.edu/billing/due-dates>) website. Payment is due by 5 p.m. Mountain Time on the due date or 11:59 p.m. if paying online. Learn about exceptions for weekends and holidays (<https://bursar.colorado.edu/billing/due-dates/#important>).

Payment Methods

We encourage online payment from a traditional U.S. checking or savings account (electronic check or eCheck) in order to avoid paying a nonrefundable 2.75 percent service fee charged by NelNet Business Solutions for all credit and debit card transactions. Paying by eCheck is secure, fast and free.

We accept American Express, MasterCard, Visa and DISCOVER. A nonrefundable 2.75 percent fee applies to all credit and debit card transactions.

International payments (bank and wire transfers) can be made using Flywire. For more information about Flywire, visit the International payment (<https://bursar.colorado.edu/payments/payment-methods/international>) webpage.

Learn about other payment methods on the Bursar's Office (<https://bursar.colorado.edu/payments>) website.

Payment Plans

Optional payment plans are available for students and authorized payers to pay tuition and fees over the course of the semester. For more information, visit the Payment Plans (<https://bursar.colorado.edu/payments/payment-plans>) webpage.

Also see the Policies (p. 873) section.

Tuition and Fee Policies

Add/Drop Tuition Adjustment

Adjustment of tuition and fees is made accordingly based on dates in the Add/Drop Calendar (<http://www.colorado.edu/registrar/students/academic-calendar/add-drop-calendar>).

Concurrent Bachelor's/Master's Degree Programs

The Graduate School, in cooperation with the other colleges and schools, has instituted a concurrent bachelor's/master's degree option.

Students should talk with specific departments regarding programs offered and verification of the following statements:

1. Students who complete the requirements for the concurrent bachelor's/master's degree receive both degrees simultaneously.

2. Students admitted to concurrent programs may register for graduate courses before they receive a bachelor's degree.
3. Students admitted to bachelor's/master's programs will pay tuition according to their undergraduate/graduate status throughout the five to six years required to complete the concurrent bachelor's/master's degrees. Graduate students are assessed graduate tuition and fee rates and if receiving financial aid are considered "independent" once reaching graduate status.
4. Students admitted to concurrent degree programs are regarded as undergraduate students for the purposes of receiving financial aid until they are advanced to graduate status. Students pursuing a concurrent bachelor's/master's degree are automatically changed to graduate status after the completion of 130 credit hours (or 145 credit hours for a student in the College of Engineering and Applied Science). All credits earned at CU (including incomplete or in-progress grades), as well as transfer and AP credit are included in the total credit-hour limit for undergraduate status.

Credit and Debit Card Service Fee

A nonrefundable 2.75 percent service fee charged by NelNet Business Solutions applies to all credit and debit card transactions. To avoid paying this fee, we encourage payment from a U.S. checking or savings accounts (electronic check or eCheck).

Dispute Rights

To dispute tuition and mandatory fee charges, you must make a formal appeal to the Tuition Dispute Committee by the end of the semester (last day of finals). Disputes will only be considered under extenuating circumstances, such as university error, recent medical condition, immediate family emergency, recent unanticipated financial problems and verified nonattendance. Official documentation must be provided to substantiate the circumstances. Complete a tuition dispute form and return the form, your statement and official documentation to the Bursar's Office Student Billing Department, Regent Administrative Center, 43 UCB, Boulder, CO 80309-0043, 303-492-5381 or bursar@colorado.edu. If you disagree with the charges and fail to avail yourself of the dispute process by the end of the semester, you will have been deemed to have waived your right to dispute the charges. For additional information on the dispute process, see Tuition Dispute (<https://bursar.colorado.edu/billing/tuition-dispute>).

Failure to Make Payment

Failure to make the required payment in accordance with the scheduled payment deadline may result in any or all of the actions described below.

A financial hold may be placed on your student record and remain until the balance is paid in full. You will not be able to:

- Adjust your current schedule (drop or add classes).
- Register for future classes.
- Receive transcripts.
- Receive a diploma or certification materials.
- Be re-admitted.

A late payment charge is assessed once per semester based on the amount due:

Balance Due and Late Charge

Balance Due	Late Charge
\$1.00-99.99	\$5.00
\$100.00-299.99	\$10.00

\$300.00-499.99	\$20.00
\$500.00-699.99	\$30.00
\$700.00-899.99	\$40.00
\$900.00 and over	\$50.00

In addition, finance charges of one percent (1%) per month are assessed on the unpaid principal balance. Finance charges are calculated by applying the periodic rate of one percent (1%) per month (annual percentage rate of 12%) to the unpaid principal balance less any payments or credits made.

After the end of the semester, past due accounts are referred to the university's Student Debt Management department (SDM) for collection. Students will have an opportunity to establish a university-approved repayment agreement. Establishing a repayment agreement does not result in release of financial holds.

If the balance is not paid or a university-approved repayment agreement does not exist after six months, Colorado law requires the university to place all delinquent accounts with a private collection agency at which time the delinquency is reported to national credit bureaus.

Student accounts referred to an outside collection agency may incur collection agency costs, expenses and fees. Such collection costs, expenses and fees may include percentage-based fees charged to the university by the collection agency, including percentage-based fees of up to 30 percent of the debt collected. Any collection costs stated above are charged in addition to the principal, fees and interest due on the student's account. The student may be responsible for reasonable attorneys' fees and court costs associated with collecting or enforcing payment on the past due account as allowed under Colorado law. Pursuant to Colorado Revised Statutes § 23-5-115, in the event the student defaults on the amount owed to the university, the university may certify to the Colorado Department of Revenue information required for the recovery of past due debt.

Nondegree Students

Nondegree students enrolled in undergraduate courses are assessed tuition at the undergraduate student rate. Nondegree students enrolled in graduate courses are assessed tuition at the graduate student rate. Nondegree students enrolled in both graduate and undergraduate courses are assessed tuition at the undergraduate student rate.

Returned Payments

A \$20 fee is charged for all payments returned due to insufficient funds, closed account, or payment stopped (regardless of the amount). A \$30 fee is charged by NelNet Business Solutions for returned payment plan payments. In addition, late and finance charges may be assessed and certified funds may be required when you make payment. A financial hold may also be placed on your account and you may be liable for collection costs and attorneys' fees as allowed by Colorado laws.

Payments are most often returned because deposits have been held. To avoid charges and penalties, call your bank to guarantee availability of funds.

Students Registered on More than One Campus

Students registering for courses on more than one campus of the university during a single semester pay tuition and fees to each campus at the rate appropriate to the number of credits for which they are registered on that campus. Students may be eligible to use the

concurrent registration option, in which case they pay the tuition rate of their home campus for the total hours enrolled at all campuses.

Tuition and Fee Agreement and Disclosure

Any student who completes registration agrees to pay CU Boulder according to the payment terms in the Tuition and Fee Agreement and Disclosure (<https://bursar.colorado.edu/payments/payment-policies/tuition-fee-agreement-and-disclosure>).

Tuition Classification

Students are classified as residents, nonresidents or international nonresidents for tuition purposes on the basis of answers provided on their application for admission and other relevant information. For more information, go to Tuition Classification (<http://www.colorado.edu/registrar/students/state-residency>).

Withdrawal Policy Regarding Tuition and Fees

Students who pay the \$200 confirmation deposit and register for classes for any given semester are obligated to pay full tuition and fees for that semester, unless they officially withdraw from the university by published deadlines.

Tuition and fee obligations for students withdrawing from fall or spring semesters:

- Continuing students: Students who withdraw during the full-refund periods will have their confirmation deposit refunded unless there are any outstanding charges.
- New and readmitted students: New, readmitted and transfer students are not eligible for a refund of the confirmation deposit.

Deadlines to withdraw with no financial penalty vary by semester but occur about ten days before the first day of instruction. For the current refund and assessment schedule, visit the Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage.

If students withdraw after the deadline to withdraw without being assessed a financial penalty, but before 11:59 p.m. on the third Wednesday of instruction, they are assessed a \$200 withdrawal processing fee. The confirmation deposit is automatically credited toward the withdrawal fee.

After the third Wednesday of instruction (the first drop deadline), there are three additional assessment periods.

- From the third Wednesday of instruction through the fifth Wednesday, students will be charged 40 percent of total tuition (not including the portion of tuition paid by College Opportunity Fund (COF) for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the fifth Wednesday of instruction through the seventh Wednesday, students will be charged 60 percent of total tuition (not including the portion of tuition paid by COF for in-state undergraduate students) and mandatory fees (CUSG student fees, athletic fee and capital construction fee).
- After the seventh Wednesday of instruction, tuition will not be adjusted. In the case of extenuating circumstances (university error, recent medical condition, immediate family emergency, recent unanticipated financial problems or verification of non-attendance), students may dispute tuition and mandatory fee charges through the Bursar's Office. COF credit hours are expended and not refunded for withdrawals after the published deadline.

To comply with federal financial aid regulations, financial aid recipients' loan and scholarship awards may be adjusted.

Students should visit the Withdraw from CU (<http://www.colorado.edu/registrar/students/withdraw-cu>) webpage for the most recent information, as the Board of Regents reserves the right to revise this schedule at any time. Refer to the Summer Session (<http://www.colorado.edu/summer>) website for information on the withdrawal policy and refund schedule for summer terms.

Students who do not pay the full amount due the university at the time of withdrawal must make arrangements for payment with the Student Debt Management department in the Bursar's Office. All withdrawals are handled through the Office of the Registrar.

Funding for Graduate School

CU Boulder administers various forms of financial assistance for graduate students: fellowships, traineeships, scholarships, research and teaching assistantships and awards from outside agencies.

Financial Aid

The University of Colorado offers several types of financial assistance for graduate students who demonstrate financial need. Students apply for assistance by submitting a financial aid application (the FAFSA) as soon as possible after January 1.

Colorado residents may be eligible for the Colorado Graduate Grant program and the Graduate Fee Grant program. Both are automatically considered with the FAFSA application.

Graduate students may apply for long-term loans through the Stafford Loan (formerly GSL) program or the Perkins Loan program (formerly the National Direct Student Loan) and for part-time jobs through the college work-study program.

Graduate Part-Time Instructors and Teaching Assistants

Many departments employ graduate students as graduate part-time instructors (GPTIs) or as teaching assistants (TAs). GPTIs must possess a master's degree or the equivalent and have demonstrated competence in classroom teaching. Teaching assistants are not required to have previous teaching experience. In order to be eligible to be a GPTI or a TA, one must be a full-time enrolled graduate student, with a cumulative GPA of at least 3.00. Compensation is based on the percentage of time worked, and includes a tuition waiver and partial insurance benefit.

Research Assistants

In many departments, research activities provide opportunities for graduate students to work part time as research assistants. All research assistants must maintain a cumulative GPA of at least 3.00 and be full-time regularly enrolled graduate students. Compensation is based on percentage of time worked and includes a tuition waiver and partial insurance benefit.

Other Funding Opportunities

Graduate Students are encouraged to seek funding by applying for fellowships and awards. While there are a number of fellowships and grants that are funded through the University, the majority are awarded by governmental agencies, private foundations and corporations.

A partial list of extramural and University fellowships can be found on the Graduate School's website (<http://www.colorado.edu/graduateschool/graduate-student-funding>). Students should also consult

with directories of funding sources, such as the Annual Register of Grant Support and The Grants Register, both available in community or university libraries.

Colleges & Schools

Arts & Sciences

The College of Arts & Sciences is the liberal arts college at CU Boulder. Its mission is to provide an outstanding liberal arts education for its undergraduates, cutting-edge graduate education and world-class research, scholarship and creative work. In addition to gaining the knowledge and skills of their areas of study, students learn how new information is acquired and can participate in original research and creative work with individual faculty members.

The college offers a wide variety of fields of study, with nearly 50 undergraduate majors. The environment and advantages of a small liberal arts college are created through "academic neighborhoods" in which students can meet and interact with other students and faculty in small group settings. In addition, more than 60 percent of undergraduate classes are small, with 25 or fewer students.

As the liberal arts college of CU Boulder, the College of Arts and Sciences has several goals in the education of its students:

- Educate students for careers and a productive life. Arts and sciences students gain the most current knowledge and skills in their major fields of study. In addition, they learn how to acquire new skills to contend with-and lead-the changes that will occur in the decades to come. Education for a productive life also requires that students learn how to analyze situations, solve problems and speak and write effectively.
- Provide students with a well-rounded education. Arts and sciences students acquire a broad knowledge and an integrated understanding of art and music, great literary works, philosophy, history and politics, the social world, science and technology. They learn how to critically evaluate and think about morals, ethics and values. The core curriculum and breadth requirements give students a broad, liberal-arts education that develops the whole person, not just the specialist.
- Educate citizens who can think for themselves, understand the rapidly changing world and make wise choices within a democratic system.
- Impart a love of learning so that students can continue to grow throughout life.
- Teach ways of thinking about and approaching new problems. For some students, this will enable them to further advance knowledge and scholarship in the academy. For all students, this is important for enriching their lives.
- Prepare students to help enrich the lives of others. Arts and sciences graduates become lifelong resources for their families, neighbors, friends and coworkers.

The college is also dedicated to outstanding graduate education. Advanced degrees are offered by nearly every academic department in the college, and the PhD is offered in approximately 30 different disciplines. In addition, an increasing number of departments offer combined bachelor's/master's degrees that can be earned in five years. Graduate training focuses on teaching and research careers as well as on professional careers in the public and private sector.

The strength of the College of Arts and Sciences comes from its outstanding faculty. In addition to being dedicated teachers, they are active scholars in disciplines throughout the arts and humanities, social and behavioral sciences, biological sciences and physical and mathematical sciences. They are the recipients of numerous national awards and honors for their research, scholarship and creative work. Faculty and staff of the College of Arts and Sciences join together to create an intellectual community of students and scholars to discover, critically examine, integrate, preserve and transmit knowledge, wisdom and values.

Programs of Study

Anthropology

The Department of Anthropology offers graduate programs leading to the Master of Arts and Doctor of Philosophy degrees with specializations in the subdisciplines of archaeology, biological anthropology and cultural anthropology. Students who acquire an advanced degree are equipped to transmit to others the knowledge, central principles, theories and research methods that have been developed in the discipline of anthropology.

Successful candidates will have a reasonable knowledge of the historical development of general anthropological concepts and theory and of directly relevant concepts and knowledge from related disciplines. In addition, successful candidates for the doctoral degree are expected to carry out and report original anthropological research within a circumscribed area of specialization. They are also expected to be capable of teaching the precepts of their specialty and of guiding future candidates for the doctoral degree through a program of research training.

Course code for this program is ANTH.

Master's Degree

- Anthropology - Master of Arts (MA) (p. 880)

Doctoral Degree

- Anthropology - Doctor of Philosophy (PhD) (p. 883)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bamforth, Douglas (https://experts.colorado.edu/display/fisid_101027)
PhD, University of California-Santa Barbara

Bernstein, Robin Miriam (https://experts.colorado.edu/display/fisid_152968)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Cameron, Catherine M (https://experts.colorado.edu/display/fisid_108375)
Professor; PhD, University of Arizona

Cool, Alison Collier (https://experts.colorado.edu/display/fisid_154599)
Assistant Professor; PhD, New York University

Covert, Herbert H (https://experts.colorado.edu/display/fisid_101542)
Professor; PhD, Duke University

Deluca, Laura M (https://experts.colorado.edu/display/fisid_101414)
Asst Professor Adjunct

Dufour, Darna L (https://experts.colorado.edu/display/fisid_100213)
Professor; PhD, SUNY at Binghamton

Eddy, Frank W.
Professor Emeritus

Goldfarb, Kathryn Elissa (https://experts.colorado.edu/display/fisid_156471)
Assistant Professor; PhD, University of Chicago

Goldstein, Donna M (https://experts.colorado.edu/display/fisid_100448)
Professor; PhD, University of California-Berkeley

Greene, David Lee
Professor Emeritus

Gutierrez, Gerardo (https://experts.colorado.edu/display/fisid_146867)
Associate Professor; PhD, Pennsylvania State University

Hammons, Christian Stanford (https://experts.colorado.edu/display/fisid_152915)
Instructor; PhD, University of Southern California

Jacka, Jerry Keith (https://experts.colorado.edu/display/fisid_156067)
Assistant Professor; PhD, University of Oregon

Jones, Carla Mae (https://experts.colorado.edu/display/fisid_134172)
Associate Professor; PhD, University of North Carolina Chapel Hill

Joyce, Arthur A (https://experts.colorado.edu/display/fisid_115421)
Professor; PhD, Rutgers University New Brunswick

Kaschube, Dorothea V.
Professor Emeritus

Kelso, Alec J.
Professor Emeritus

Lambert, Joanna E (https://experts.colorado.edu/display/fisid_156206)
Professor; PhD, University of Illinois at Urbana-Champaign

Leigh, Steven Robert (https://experts.colorado.edu/display/fisid_151706)
Professor; PhD, Northwestern University

Lekson, Steve (https://experts.colorado.edu/display/fisid_108312)
Professor; PhD, University of New Mexico

McCabe, J Terrence (https://experts.colorado.edu/display/fisid_100063)
Professor; PhD, SUNY at Binghamton

McGilvray, Dennis B.
Professor Emeritus

McGoodwin, James Russell
Professor Emeritus

McGranahan, Carole Ann (https://experts.colorado.edu/display/fisid_122673)
Associate Professor; PhD, University of Michigan Ann Arbor

Ortman, Scott Graham (https://experts.colorado.edu/display/fisid_152978)
Assistant Professor; PhD, Arizona State University

Roland, Lorecia Kaifa-Aliya (https://experts.colorado.edu/display/fisid_143551)
Associate Professor; PhD, Duke University

Sauther, Michelle Linda (https://experts.colorado.edu/display/fisid_107236)
Professor; PhD, Washington University

Scanlan-Lyons, Colleen M. (https://experts.colorado.edu/display/fisid_148419)
Asst Professor Adjunct

Shankman, Paul
Professor Emeritus

Shannon, Jennifer A. (https://experts.colorado.edu/display/fisid_147612)
Associate Professor; PhD, Cornell University

Sponheimer, Matthew James (https://experts.colorado.edu/display/fisid_129957)
Professor; PhD, Rutgers University New Brunswick

Stein, Lara C (https://experts.colorado.edu/display/fisid_156437)
Asst Professor Adjunct

Van Gerven, Dennis P.
Professor Emeritus

Walker, Deward E. Jr
Professor Emeritus

Williams, Bianca Christel (https://experts.colorado.edu/display/fisid_147342)
Associate Professor; PhD, Duke University

Courses

ANTH 5000 (3) Quantitative Methods in Anthropology

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4000

Requisites: Restricted to graduate students only.

ANTH 5020 (3) Explorations in Anthropology

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ANTH 5045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4045 and MUSM 5045

Requisites: Restricted to graduate students only.

ANTH 5060 (3) Nutrition and Anthropology

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4060

Requisites: Restricted to graduate students only.

ANTH 5070 (3) Methods in Biological Anthropology

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4070

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 5110 (3) Human Evolutionary Biology

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4110

ANTH 5120 (3) Advanced Biological Anthropology

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4120

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ANTH 5125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4125

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ANTH 5129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4129 and

ARTH 4129 and CLAS 4129 and CLAS 5129

ANTH 5130 (3) Advanced Osteology

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4130

ANTH 5150 (3) Human Ecology: Biological Aspects

Discusses role of human populations in local ecosystems, factors affecting population growth, and human adaptability to environmental stress. Detailed consideration of case studies of small-scale societies in different ecosystems.

ANTH 5160 (3) Early Hominin Paleoecology

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4160

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ANTH 5170 (3) Primate Evolutionary Biology

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4170

ANTH 5210 (3) Southwestern Archaeology

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4210

ANTH 5220 (3) From Olmec to Aztec: The Archaeology of Mexico

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4220

Requisites: Restricted to graduate students only.

ANTH 5224 (3) Archaeology of the Maya and Their Neighbors

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4224

Requisites: Restricted to graduate students only.

ANTH 5240 (3) Geoarchaeology

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4240

Requisites: Restricted to graduate students only.

ANTH 5270 (3) Plains Archaeology

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4270

ANTH 5330 (3) Human Ecology: Archaeological Aspects

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4330

Requisites: Restricted to graduate students only.

ANTH 5345 (3) Archaeological Theory

Provides an advanced introduction to the history of archaeological theory from the late 19th century to the present. Topics include culture history, cultural evolution, systems ecology, behavioral archaeology, analogy and middle range theory, collective action, ecology, agency, practice, gender, identity, landscape, epistemology, materiality and memory.

Requisites: Restricted to graduate students only.

ANTH 5350 (2-6) Archaeological Field and Laboratory Research

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4350

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 5380 (3) Lithic Analysis and Replication

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4380

Requisites: Restricted to graduate students only.

ANTH 5390 (3) Research Methods in Archaeology 1

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4390

Requisites: Restricted to graduate students only.

ANTH 5400 (3) Research Methods in Archaeology 2

Focuses on the design of research including constructing empirical arguments and testing them, data gathering, site formation processes, field strategies (archival resources, mapping, field survey, surface collecting/recording, excavation and preliminary analysis) and artifact analysis as it relates to research design.

ANTH 5460 (3) Archaeology and Contemporary Society

Explores the intellectual climate in which archaeology is practiced and how it influences archaeological research and reconstruction, laws, regulations, and ethical issues. Explores public use of and engagement with archaeology.

Requisites: Restricted to graduate students only.

ANTH 5470 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4470 and MUSM 4912 and MUSM 5912

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

ANTH 5500 (3) Cross-Cultural Aspects of Socioeconomic Development

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4500

Requisites: Restricted to graduate students only.

ANTH 5530 (3) Theoretical Foundations of Sociocultural Anthropology

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4530

Requisites: Restricted to graduate students only.

ANTH 5570 (3) Anthropology of Fishing

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4570

Requisites: Restricted to graduate students only.

ANTH 5610 (3) Medical Anthropology

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4610

ANTH 5630 (3) Nomadic Peoples of East Africa

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4630

Requisites: Restricted to graduate students only.

ANTH 5730 (3) Latin American Politics and Culture through Film and Text

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4730

ANTH 5735 (3) Contemporary Cuban Culture: Race, Gender and Power

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4735

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ANTH 5745 (3) Science, Technology and Society

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4745

Grading Basis: Letter Grade

ANTH 5750 (3) Culture and Society in South Asia

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4750

Additional Information: Departmental Category: Asia Content

ANTH 5755 (3) Cultures of Expertise: Science, Power and Knowledge

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4755

Grading Basis: Letter Grade

ANTH 5760 (3) Ethnography of Southeast Asia and Indonesia

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4760

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Asia Content

ANTH 5770 (3) Core Course---Archaeology

Provides a graduate-level overview of analytic issues relevant to all phases of archaeological research and of the diversity of theoretical perspectives within the field as a whole. Course is required for all first-year graduate students in anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5780 (3) Core Course-Cultural Anthropology

Provides an intense, graduate-level introduction to the discipline of cultural anthropology, with an emphasis upon critically assessing those methods, theories, and works that have shaped the field from the 19th century to the present time. Required of all first-year graduate students in anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5785 (3) Advanced Seminar in Cultural Anthropology

Details the history of theory and practice in contemporary cultural anthropology, considering the development of major theoretical schools of thought and the integration of general social theory within anthropology. Required of masters students in cultural anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5790 (3) Core Course---Biological Anthropology

Discusses how biological anthropologists use evidence and concepts from evolutionary theory, human biology, and ecology to understand the evolution, diversification, and adaptation of human populations. Required of all first-year graduate students in anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5795 (3) Proseminar in Anthropology

Introduces incoming first-year graduate students to the history and current state of scholarship in anthropology from across the subdisciplines, through introduction to the research of individual faculty in the department. Required of all incoming graduate students.

Requisites: Restricted to graduate students only.

ANTH 5840 (1-6) Guided Study

Directed individual research based on a specific area of specialization.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ANTH 5930 (1-6) Anthropology Internship

Provides academically supervised opportunities graduate students to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4930

Repeatable: Repeatable for up to 9.00 total credit hours.

ANTH 6150 (3) Critical and Theoretical Issues in Museums

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 6150 and HIST 6150 and ARTH 6150

Requisites: Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

ANTH 6320 (3) Linguistic Anthropology

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

Equivalent - Duplicate Degree Credit Not Granted: LING 6320

Requisites: Restricted to graduate students only.

ANTH 6500 (3) Issues in Indigenous Languages

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

Equivalent - Duplicate Degree Credit Not Granted: LING 6500

Grading Basis: Letter Grade

ANTH 6940 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

ANTH 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 7000 (3) Seminar: Current Research Topics in Cultural Anthropology

Discusses current research and theoretical issues in the field of cultural anthropology.

Requisites: Restricted to graduate students only.

ANTH 7010 (3) Seminar: Contemporary Theory in Cultural Anthropology

Addresses current theoretical perspectives in cultural anthropology and controversies surrounding them. Discusses science, history, interpretation, and postmodernism. Includes the relationship between theory and method as well as the production of ethnography.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ANTH 7020 (3) Seminar: Physical Anthropology

In-depth discussion of selected topics in physical anthropology with emphasis on recent research.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ANTH 7030 (3) Seminar: Archaeology

Intensive examination of selected theoretical or methodological topics in archaeology. Topics vary with current research emphasis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ANTH 7140 (3) Seminar: Archaeology of Selected Areas

Considers archaeology of a specified area, either geographical or topical. Areas selected in accordance with current research interests. May be repeated upto 9 total credit hours.

Repeatable: Repeatable for up to 9.00 total credit hours.

ANTH 7300 (3) Seminar: Research Methods in Cultural Anthropology

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 7600 (3) Human Ecology: Cultural Aspects

Reviews and critically examines the major theoretical perspectives for understanding the relationship between human social behavior and the environment developed in the social sciences, especially anthropology, over the last 100 years. Formerly ANTH 5600.

ANTH 7620 (3) Seminar: Ethnography and Cultural Theory

Explores how ethnographic writing has evolved over the past century to incorporate different forms of cross-cultural representation and to accommodate new theoretical paradigms. Includes ethnographic authority and reflexivity, as well as embedded theories and blurred genres of cultural research.

ANTH 7840 (1-6) Independent Research

Research aimed at developing a solution to an originally conceived research problem.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ANTH 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the graduate school section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Anthropology - Master of Arts (MA)

Departmental Subdisciplines

Anthropology in the United States is traditionally divided into four subdisciplines: archaeology, biological, cultural and linguistic. Of these, the first three are major curricular options available to graduate students in anthropology at CU Boulder. Although the three subdisciplines offered in our program require approximately the same minimum number of credit hours for their respective MA and PhD degrees, and all include ANTH 5795 Proseminar in Anthropology, plus a required cross-

subdisciplinary seminar on the list of classes required for this total, they differ substantially in the number of other specific requirements. Particularly at the MA level, there is much less flexibility in some subdisciplines than in others, and students should bear this in mind when choosing their specialty and in registering for classes.

Archaeology

The archaeology subdiscipline provides continuous geographic coverage of ancient societies from the Plains of North America through the Southwest and Mesoamerica to the Intermediate Area. The native societies range from egalitarian hunter-gatherers through middle range societies to city-states and empires. The faculty's theoretical and topical interests include human ecology, ethnoarchaeology, agency and social theory, lithic and ceramic analyses, remote sensing, and geophysical applications in archaeology.

Archaeology links with biological anthropology in a number of ways. For instance, archaeologists encountering burials frequently turn to biological anthropologists for analyses of stature, health, and other topics. Many archaeologists and biological anthropologists share a deep interest in human ecology, the ways people have adapted to their environments and have affected those environments.

Archaeology also relates to cultural anthropology in significant ways, since much archaeological theory is derived from cultural theory. Given the vast diachronic interests of archaeology, significant archaeological theory is also derived independently from ethnography. Ethnoarchaeology spans the two subdisciplines, as archaeologists study the material culture of functioning contemporary societies to learn how better to make inferences about past behavior. Both archaeology and cultural anthropology study ethnic and political groups in contact with each other, including topics of ethnohistory, migration, acculturation, trade and tribute, conquest, information sharing, elite emulation, and the rise of multiethnic powers.

Biological Anthropology

Biological anthropology encompasses genetics (the study of gene structure, processes, and patterns of inheritance), paleoanthropology (the study of human and primate evolution in the fossil record), osteology (the study of the skeleton), paleopathology (the study of evidence of disease and trauma in skeletal and fossil remains), primatology (the study of the behavior and ecology of nonhuman primates), and human biology (biocultural study of biological variation in living human populations).

The biological anthropology faculty at CU have interests and research strengths that cross sub-disciplinary boundaries and foster collaboration with faculty and graduate students in other disciplines and sub-disciplines. We share an interest in human ecology, the broad integrative area of anthropology that focuses on the interactions of culture, biology and the environment. We also share an interest in the processes of globalization, which are rapidly changing many aspects of the modern world. As biological anthropologists, we are well positioned to analyze the impact of globalization on the interaction between biology and behavior, and to analyze human and primate adaptations to changing environments and declining biodiversity.

The department offers training in several different aspects of ecology: general ecology, early hominin paleoecology, nutritional, community, and evolutionary ecology. Our research foci also include anthropogenic and climatic effects on primate behavior and biology; conservation biology; primate evolution; feeding biology of humans and non-human primates; biogeochemical techniques for studying the diets and habitats of modern

and fossil fauna; life history; endocrinology; growth and development; and maternal and infant health.

We carry out research and offer training and research opportunities at a wide range of international sites, including: Bezà Mahafaly, Madagascar; Lajuma Research Centre and the Mokopane Conservation Centre, South Africa; The Cradle of Humankind World Heritage Site, South Africa; 12 museums in South Africa, Kenya, and Ethiopia; Kibale National Park, Uganda; Keneba, The Gambia; Cali, Colombia; Ta Kou Nature Reserve, Kien Luong Karst area, and Khau Ca Forest area, Vietnam. Our laboratories offer analytical capabilities and training in a broad range of methods, from measurement of human energy expenditure, to immunoassay and mid-infrared spectroscopy, to plant nutritional analysis. Our field sites offer training and research on primate health, community ecology, plant-animal interactions, forest ecology, nutritional ecology, conservation biology, dental ecology, and paleoecology.

Please note that we do not train students specifically in forensics.

Cultural Anthropology

Cultural anthropologists study the cultural patterns and social institutions that shape how people think and behave in human communities across the globe, including their own society. While their findings are frequently comparative or cross-cultural in scope, cultural anthropologists undertake ethnographic studies through intensive participant-observation in particular cultures, subcultures, communities, and regions. The insights of cultural anthropology are typically derived from long-term fieldwork conducted in the local language of a community, with the goal of acquiring an integrated understanding of the interactions between individual actors and local, culturally diverse patterns of life. Among the topical interests of the cultural faculty are gender and sexuality, cultural theory, symbolic anthropology, religion and ritual, human ecology, pastoralism, political economy, applied anthropology, medical anthropology, science, technology and society studies, nationalism and ethnic identity, post-colonialism, tourism, history and memory, and visual anthropology. Areas of regional expertise in the department include Latin America, Native America, Atlantic Canada, South Asia, Southeast Asia, Tibet, East Africa, the Caribbean, Polynesia, and Western Europe, as well as their respective diasporas around the world.

Additionally, the cultural faculty are united in sharing an interest in globalization, bringing their ethnographic skills to bear on the contemporaneous but countervailing forces that paradoxically tend at once to global homogenization and local fragmentation. Processes related to globalization studied by cultural faculty and students include the increasingly planetary integration of the economy; the spread of human insecurity with the proliferation of ethnic conflict, violence, crime, disease, and financial volatility; the global depletion and degradation of environmental subsistence resources; the impact of tourism and large-scale development projects; the internationalization of environmental, feminist, religious, and human rights movements; the universalization of democratic structures; the rise of "world cities"; the invention of new information and communication technologies; and the increasingly global flows of advertising and consumer goods. The cultural faculty's interest in processes of globalization, human ecology, and applied anthropology also intersect with areas of specialization in archaeology and biological anthropology.

Dual Degree Program Anthropology (MA/MBA)

The MBA/MA in anthropology dual-degree program enables students to earn an MBA and an MA in anthropology simultaneously over three or four years depending on the student's subdiscipline in anthropology. Students in this MBA/MA program pursue careers in managing the business aspects of archaeological projects, working in the growing field of corporate cultural anthropology and ethnography or museum management.

Requirements

Prerequisites

To be considered for admission as a regular degree student, applicants should have a minimum undergraduate grade point average of 3.00 (4.00 = A) or a Master of Arts degree in anthropology. Graduate Record Examination scores for verbal and quantitative aptitude tests are required. Letters of recommendation and evidence of previous anthropologically oriented experience and work are carefully considered. Students with fewer than 18 credit hours of previous course work in anthropology are considered deficient and may be asked to present a greater number of credit hours for a degree.

Application

Inquiries concerning applications should be directed to the main departmental office. Completed applications are reviewed once each year and are due by Jan. 15. Students with no previous graduate work should apply for entrance into the MA program, which if successfully completed will prepare them for the PhD program. Students who have or will have completed an MA degree in anthropology by the time of their admission may apply for direct admission into the PhD program, but they may be required to complete specific remedial requirements in some cases.

Course Requirements

Students may have a primary specialization in any of the major subfields of anthropology: archaeology, cultural or biological anthropology. The department expects graduate students to maintain a breadth of competence in general anthropology through the master's degree with specialization intensifying with progress toward the PhD degree.

All entering graduate students must have had the equivalent of ANTH 4000 Quantitative Methods in Anthropology or ANTH 5000 Quantitative Methods in Anthropology or take the course (or, in the case of cultural anthropology students, an appropriate "tool course") during their first year in residence.

As partial fulfillment towards a graduate degree, all students must complete ANTH 5795 Proseminar in Anthropology, which covers the three subdisciplines of anthropology (cultural, biological and archaeology). The proseminar should be taken during the first semester in residence, if possible. In addition, students are required to take one graduate seminar focusing on one of the two subdisciplines outside of their primary specialization. Other specific course requirements are established through a consultation with an academic advisor.

Additional information about other specific areas of specialization and other requirements for the degree may be obtained by writing directly to the Department of Anthropology, and by referencing the Master's Degree Requirements (p. 866) section. Information is also available on the Department of Anthropology (<http://www.colorado.edu/anthropology>) website.

Archaeology Subdiscipline

MA students in archeology must follow plan I and successfully write and defend a master's thesis. Minimum credit hours with thesis: 30 hours.

The graduate curriculum at CU is designed to progress from a general overview of anthropology (the core sequence) to an increasingly specific focus on the individual student's research interests. The faculty very strongly urges students to follow this sequence, beginning with ANTH 5795 Proseminar in Anthropology. Except in extremely unusual circumstances, students are expected to take the proseminar in their first year.

Note that, although graduate students carrying only 5 credits are considered to be full-time at CU Boulder, making timely progress through our program and taking elective classes in the first year generally requires students to carry three classes (9 credits). Students who choose to carry fewer than three courses per semester are still expected to complete the proseminar in the first year, regardless of what other classes might be offered, and should understand that such a choice may add significantly to the time it takes them to complete their course work.

Core Requirements

ANTH 5795	Proseminar in Anthropology	3
One graduate-level anthropology seminar not in the student's subdiscipline (any non-split-level graduate seminar, including bridging seminars)		3

ANTH 5000	Quantitative Methods in Anthropology	3
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Other Required Courses

ANTH 5345	Archaeological Theory	3
ANTH 5390	Research Methods in Archaeology 1	3
ANTH 5460	Archaeology and Contemporary Society	3
One or two elective graduate courses chosen with advisor		3-6
ANTH 6950	Master's Thesis	4-6

Total Credit Hours		30
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NOTE: Any transfer credit or other proposed substitutions for required course work should be addressed by petition to the Graduate Committee.

Recommended Course Work

The faculty strongly recommends students take one or more additional classes beyond the required minimum, particularly classes in regional culture histories, general anthropology, and relevant topics in other departments (such as geology and geography). Other classes can include any relevant to a student's program of study, including archaeological area and topical classes, ethnographic theory and area classes, and classes in related departments (such as geology, geography, biology, etc.). Elective classes should be chosen in consultation with each student's advisor.

Biological Anthropology Subdiscipline

Biological anthropology students normally follow plan I (thesis), and successfully write and defend a master's thesis. Biological anthropology students may follow plan II (non-thesis) and complete their degree with a comprehensive exam only if the MA is the final objective or the student has been trained outside of anthropology and requires a broader background. Plans will be individualized according to students' previous training and professional objectives.

Core Requirements

ANTH 5795	Proseminar in Anthropology	3
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One graduate-level anthropology seminar not in the student's subdiscipline (any non-split-level graduate seminar, including bridging seminars) 3

ANTH 5000 Quantitative Methods in Anthropology 3

Electives/Thesis

Select one of the following plans:

Plan I

ANTH courses at the 5000 level or above

ANTH 6950 Master's Thesis

Plan II

ANTH courses at the 5000 level or above

Recommended Elective Course Work ¹

ANTH 5060 Nutrition and Anthropology

ANTH 5070 Methods in Biological Anthropology

ANTH 5110 Human Evolutionary Biology

ANTH 5170 Primate Evolutionary Biology

ANTH 5120 Advanced Biological Anthropology

Total Credit Hours 30

¹ Students are expected to select other classes in anthropology and related disciplines in consultation with their advisor. Depending on the number of master's thesis hours (4–6), a student will normally have 12–14 elective credit hours. A handout of potential courses in other departments can be obtained from the student's advisor. Students in Biological Anthropology are advised to take at least one class with each of the Biological Anthropology faculty, including but not limited to the courses above.

NOTE: Any transfer credit or other proposed substitutions for required course work should be addressed by petition to the Graduate Committee.

Cultural Anthropology Subdiscipline

MA students in cultural anthropology may follow Plan I (thesis option) or Plan II (non-thesis option). Minimum hours with or without thesis: 30 hours.

Required Course Work

Select Either: 3

ANTH 5840 Guided Study

An Ethnographic Area Course (ANTH 5565, 5630, 5690, 5730, 5750, 5760)

Core Requirements

ANTH 5780 Core Course-Cultural Anthropology 3

ANTH 5785 Advanced Seminar in Cultural Anthropology 3

ANTH 5795 Proseminar in Anthropology 3

ANTH 7300 Seminar: Research Methods in Cultural Anthropology 3

One graduate-level anthropology seminar not in the student's subdiscipline (any non-split-level graduate seminar, including bridging seminars) 3

Electives/Thesis

Select one of the following plans:

Plan I

ANTH courses at the 5000 level or above plus an MA thesis of 4-6 credit hours

Plan II

ANTH courses at the 5000 level or above

Total Credit Hours 30

NOTE: Any transfer credit or other proposed substitutions for required course work should be addressed by petition to the Graduate Committee.

Degree Plans

Plan I: Thesis

MA students in archaeology and biological anthropology are normally expected to write a thesis.

Plan II: Comprehensive Examination

In consultation with their advisor, students in cultural anthropology have the option of completing their MA degree by examination only.

Anthropology - Doctor of Philosophy (PhD)

Departmental Subdisciplines

Anthropology in the United States is traditionally divided into four subdisciplines: archaeology, biological, cultural and linguistic. Of these, the first three are major curricular options available to graduate students in anthropology at CU Boulder. Although the three subdisciplines offered in our program require approximately the same minimum number of credit hours for their respective MA and PhD degrees, and all include ANTH 5795 Proseminar in Anthropology plus a required cross-subdisciplinary seminar, they differ substantially in the number of other specific requirements. Particularly at the MA level, there is much less flexibility in some subdisciplines than in others, and students should bear this in mind when choosing their specialty and registering for classes.

Archaeology

The archaeology subdiscipline provides continuous geographic coverage of ancient societies from the Plains of North America through the Southwest and Mesoamerica to the Intermediate Area. The native societies range from egalitarian hunter-gatherers through middle range societies to city-states and empires. The faculty's theoretical and topical interests include human ecology, ethnoarchaeology, agency and social theory, lithic and ceramic analyses, remote sensing and geophysical applications in archaeology.

Archaeology links with biological anthropology in a number of ways. For instance, archaeologists encountering burials frequently turn to biological anthropologists for analyses of stature, health and other topics. Many archaeologists and biological anthropologists share a deep interest in human ecology, the ways people have adapted to their environments and have affected those environments.

Archaeology also relates to cultural anthropology in significant ways, since much archaeological theory is derived from cultural theory. Given the vast diachronic interests of archaeology, significant archaeological theory is also derived independently from ethnography. Ethnoarchaeology spans the two subdisciplines, as archaeologists study the material culture of functioning contemporary societies to learn how better to make inferences about past behavior. Both archaeology and cultural anthropology study ethnic and political groups in contact with each other, including topics of ethnohistory, migration, acculturation, trade and tribute, conquest, information sharing, elite emulation and the rise of multiethnic powers.

Biological Anthropology

Biological anthropology encompasses genetics (the study of gene structure, processes and patterns of inheritance), paleoanthropology (the study of human and primate evolution in the fossil record), osteology (the study of the skeleton), paleopathology (the study of evidence of disease and trauma in skeletal and fossil remains), primatology (the study of the behavior and ecology of nonhuman primates) and human biology (biocultural study of biological variation in living human populations).

The biological anthropology faculty at CU have interests and research strengths that cross sub-disciplinary boundaries and foster collaboration with faculty and graduate students in other disciplines and subdisciplines. We share an interest in human ecology, the broad integrative area of anthropology that focuses on the interactions of culture, biology and the environment. We also share an interest in the processes of globalization, which are rapidly changing many aspects of the modern world. As biological anthropologists, we are well positioned to analyze the impact of globalization on the interaction between biology and behavior, and to analyze human and primate adaptations to changing environments and declining biodiversity.

The department offers training in several different aspects of ecology: general ecology, early hominin paleoecology, nutritional, community and evolutionary ecology. Our research foci also include anthropogenic and climatic effects on primate behavior and biology; conservation biology; primate evolution; feeding biology of humans and non-human primates; biogeochemical techniques for studying the diets and habitats of modern and fossil fauna; life history; endocrinology; growth and development; and maternal and infant health.

We carry out research and offer training and research opportunities at a wide range of international sites, including: Beza Mahafaly, Madagascar; Lajuma Research Centre and the Mokopane Conservation Centre, South Africa; The Cradle of Humankind World Heritage Site, South Africa; 12 museums in South Africa, Kenya and Ethiopia; Kibale National Park, Uganda; Keneba, The Gambia; Cali, Colombia; Ta Kou Nature Reserve, Kien Luong Karst area and Khau Ca Forest area, Vietnam. Our laboratories offer analytical capabilities and training in a broad range of methods, from measurement of human energy expenditure, to immunoassay and mid-infrared spectroscopy, to plant nutritional analysis. Our field sites offer training and research on primate health, community ecology, plant-animal interactions, forest ecology, nutritional ecology, conservation biology, dental ecology and paleoecology.

Please note that we do not train students specifically in forensics.

Cultural Anthropology

Cultural anthropologists study the cultural patterns and social institutions that shape how people think and behave in human communities across the globe, including their own society. While their findings are frequently comparative or cross-cultural in scope, cultural anthropologists undertake ethnographic studies through intensive participant-observation in particular cultures, subcultures, communities and regions. The insights of cultural anthropology are typically derived from long-term fieldwork conducted in the local language of a community, with the goal of acquiring an integrated understanding of the interactions between individual actors and local, culturally diverse patterns of life. Among the topical interests of the cultural faculty are gender and sexuality, cultural theory, symbolic anthropology, religion and ritual, human ecology, pastoralism, political economy, applied anthropology, medical anthropology, science, technology and society studies, nationalism and ethnic identity, post-colonialism, tourism, history and

memory, and visual anthropology. Areas of regional expertise in the department include Latin America, Native America, Atlantic Canada, South Asia, Southeast Asia, Tibet, East Africa, the Caribbean, Polynesia and Western Europe, as well as their respective diasporas around the world.

Additionally, the cultural faculty are united in sharing an interest in globalization, bringing their ethnographic skills to bear on the contemporaneous but countervailing forces that paradoxically tend at once to global homogenization and local fragmentation. Processes related to globalization studied by cultural faculty and students include the increasingly planetary integration of the economy; the spread of human insecurity with the proliferation of ethnic conflict, violence, crime, disease and financial volatility; the global depletion and degradation of environmental subsistence resources; the impact of tourism and large-scale development projects; the internationalization of environmental, feminist, religious and human rights movements; the universalization of democratic structures; the rise of "world cities"; the invention of new information and communication technologies; and the increasingly global flows of advertising and consumer goods. The cultural faculty's interest in processes of globalization, human ecology and applied anthropology also intersect with areas of specialization in archaeology and biological anthropology.

Requirements

Prerequisites

To be considered for admission as a regular degree student, applicants should have a minimum undergraduate grade point average of 3.00 (4.00 = A) or a Master of Arts degree in anthropology. Graduate Record Examination scores for verbal and quantitative aptitude tests are required. Letters of recommendation and evidence of previous anthropologically oriented experience and work are carefully considered. Students with fewer than 18 credit hours of previous course work in anthropology are considered deficient and may be asked to present a greater number of credit hours for a degree.

Application

Inquiries concerning applications should be directed to the main departmental office. Completed applications are reviewed once each year and are due by January 15. Students with no previous graduate work should apply for entrance into the MA program, which will prepare them for the PhD program if successfully completed. Students who have or will have completed an MA degree in anthropology by the time of their admission may apply for direct admission into the PhD program, but they may be required to complete specific remedial requirements in some cases. Students with a master's degree in a closely related discipline may be considered for admission to the PhD program on a case-by-case basis, and should expect to meet all the core requirements of our graduate program. Students holding an MS in museum and field studies from CU Boulder may be admitted to the PhD program on condition of completing deficiencies in course work.

Course Requirements

Course work beyond the MA must include a minimum of 18 credit hours and 30 dissertation credit hours.

Archaeology Subdiscipline

Students entering the PhD program with an MA from another institution must complete the proseminar (ANTH 5795) in their first year of

residence and the additional Anthropology requirements (see Core Requirements for the MA) within the first two years.

Requirements

Four 7000-level seminars in the department, (in addition to any taken for the MA) at least one of which must be in another subdiscipline, or a team-taught bridging seminar.	12
Two other electives with advisor approval	6
ANTH 8990 Doctoral Dissertation	30
Total Credit Hours	48

NOTE: Any transfer credit or other proposed substitutions for required course work should be addressed by petition to the Graduate Committee.

Recommended Course Work

The faculty strongly recommends students take one or more additional classes beyond the required minimum, particularly classes in regional culture histories, general anthropology, and relevant topics in other departments (such as geology and geography). Other classes can include any relevant to a student's program of study, including archaeological area and topical classes, ethnographic theory and area classes, and classes in related departments (such as geology, geography, biology, etc.). Elective classes should be chosen in consultation with each student's advisor.

Biological Anthropology Subdiscipline

Students entering the PhD program with an MA from another institution must complete the Proseminar (ANTH 5795) in their first year of residence and the one 5000-level graduate class in Biological Anthropology (see Core Requirements in MA section for suggestions) within the first two years. They must also take Quantitative Methods (ANTH 5000) within the first four semesters if they do not have equivalent training on their record.

Requirements

Four 7000-level seminars in the department, (in addition to any taken for the MA) at least one of which must be in another subdiscipline, or a team-taught bridging seminar.	12
Two other electives with advisor approval	6
ANTH 8990 Doctoral Dissertation	30
Total Credit Hours	48

NOTE: Any transfer credit or other proposed substitutions for required coursework should be addressed by petition to the Graduate Committee.

Cultural Anthropology Subdiscipline

Students entering the PhD program with an MA from another institution must complete the proseminar (ANTH 5795) in their first year of residence. They are also expected to take the Core Seminar in Cultural Anthropology (ANTH 5780), the Advanced Seminar in Cultural Anthropology (ANTH 5785), and Research Methods (ANTH 7300) at their earliest opportunity, unless they demonstrate they have taken equivalent courses elsewhere (by petition to the Graduate Committee with advisor's endorsement). They must also complete an approved "tools" course if they have not already done so or do not have equivalent training on their record.

Foreign language requirement

Language proficiency is essential to research in cultural anthropology, so incoming graduate students are expected to identify and begin study of a foreign research language as soon as possible, preferably no later than

the first year. For languages not available at the University of Colorado, students are encouraged to begin or advance their language proficiency during the summer following their first year.

Requirements

An approved "Tools" course ¹	3
At least two 7000-level seminars in Cultural Anthropology.	6
Three classes or directed readings at the 5000 level or above (Limit: 6 credits of directed readings/Guided Study)	9
ANTH 8990 Doctoral Dissertation	30
Total Credit Hours	48

¹ The tools requirement is intended to provide a graduate student in cultural anthropology with a skill or set of skills that will enhance his or her research capabilities. Typically this involves training in a particular methodological technique or analytical process.

NOTE: Any transfer credit or other proposed substitutions for required course work should be addressed by petition to the Graduate Committee.

Applied Mathematics

The Department of Applied Mathematics in the College of Arts and Sciences offers a range of courses and research opportunities in many areas, including computational mathematics, mathematical biology, nonlinear phenomena, physical applied mathematics, and probability and statistics. Each of these areas is described below.

Course code for this program is APPM.

Computational Mathematics

The study of computational mathematics has grown rapidly in recent years and has allowed scientists and engineers to answer questions and to develop insights not possible just a decade or two ago. Modern computational methods require in-depth knowledge of a variety of mathematical subjects including linear algebra, analysis, ordinary and partial differential equations, asymptotic analysis, elements of harmonic analysis and nonlinear equations. Since computers are invaluable tools for an applied mathematician, students are expected to attain a high level of computer literacy and to gain a substantial knowledge of operating systems and hardware. Computational mathematics courses include the study of computational linear algebra, optimization, numerical solution of ordinary and partial differential equations, solution of nonlinear equations and advanced seminars in wavelet and multiresolution analysis and in multigrid methods, radial basis functions and algorithm design and development, more generally.

Mathematical Biosciences

Advances in our ability to quantitatively study biological phenomena have provided a number of exciting opportunities for applied mathematicians. The careful modeling, analysis and simulation of these systems using the standard and state-of-the-art tools of applied mathematics has led to novel and non-intuitive insights into biology. Furthermore, deeper understanding of the inherently complex and multiscale nature of biological systems, in many cases, requires the development of new mathematical tools, techniques and methodologies (a challenge to which applied mathematics is particularly well suited). For students interested in pursuing research in mathematical biology, good preparatory classes would include differential equations, advanced calculus, numerical analysis and probability and statistics, as well as supplemental courses in the appropriate biological, biomedical or bioengineering fields.

Research areas at CU encompass immunology, virology, bacteriology, population genetics and cardiac nonlinear dynamics. Specifically, current topics of interest include model selection and control of in vivo HIV pathogenesis dynamics, modeling of intracellular calcium dynamics, the analysis of heart rhythm instabilities, the role of aggregation and fragmentation in bacteremia and bacterial pneumonia, inverse problems arising in the use of population genetics and bioinformatics to identify geographic features and the analysis of patterns in biological sequences such as DNA and RNA.

Dynamical Systems and Nonlinear Phenomena

In recent years, there has been an explosion of interest in the study of nonlinear waves and dynamical systems with analytical results, often motivated by the use of computers. The faculty in the Department of Applied Mathematics are actively and intensively involved in this growing field. Research areas include qualitative analysis and computational dynamics, conservative and dissipative systems, bifurcation theory, the onset and development of chaos, wavelets and multiresolution analysis, integrable systems, solitons, cellular automata, analytic dynamics, pattern formation and symmetry, synchronization, dynamics on networks, fluid dynamics, transport and mixing and the study of nonlinear phenomena arising from the interactions of many interconnected dynamical units. Department courses in this field include dynamical systems, nonlinear wave motion and many advanced seminars. Suitable background courses are analysis, computation and methods in applied mathematics. Valuable supplemental courses include mechanics and fluid dynamics.

Physical Applied Mathematics

Physical applied mathematics is a term that generally refers to the study of mathematical problems with direct physical application. This area of research is intrinsically interdisciplinary. In addition to mathematical analysis, it requires an in-depth understanding of the underlying applications area, and usually requires knowledge and experience in numerical computation. The department has approximately 40 affiliated faculty who can direct thesis research in areas such as atmospheric and fluid dynamics, theoretical physics, plasma physics, genetic structure, parallel computation, etc. The department's course requirements are designed to provide students with a foundation for their study (analysis and computation). The department also requires supplemental courses in one of the sciences or engineering fields necessary for thesis research in physical applied mathematics.

Statistics and Applied Probability

Almost all natural phenomena in the technological, biological, physical and social sciences have random components with complex levels of interactions, part stochastic, part deterministic. Applied probability is the application of probabilistic and analytic methods to model, understand and predict the behavior of real-life problems that involve random elements. Statistics is the science of using data that typically arise from the randomness inherent in nature to gain new knowledge. Areas of current interest by applied math and their affiliated faculty include optimization of stochastic networks; the study of stochastic processes, and stochastic differential equations in hydrology and telecommunications; probabilistic models, nonparametric regression methods, shrinkage estimation, gene expression microarray data analysis, false discovery rate control, classification methods and statistical tests based on these models, in genetics and RNA sequencing; and extreme value theory in estimation of maximal wind speeds.

Appropriate course work includes analysis, stochastic processes, simulation techniques and mathematical statistics, as well as background courses in one of the sciences or engineering fields in which one intends to do research.

For details on the range of courses and research opportunities available through the Department of Applied Mathematics, visit www.colorado.edu/amath.

Master's Degree

- Applied Mathematics - Master of Science (MS) (p. 890)

Doctoral Degree

- Applied Mathematics - Doctor of Philosophy (PhD) (p. 891)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ablowitz, Mark J (https://experts.colorado.edu/display/fisid_100691)
Professor; PhD, Massachusetts Institute of Technology

Bebernes, Jerrold
Professor Emeritus

Becker, Stephen R (https://experts.colorado.edu/display/fisid_154263)
Assistant Professor; PhD, California Institute of Technology

Beylkin, Gregory (https://experts.colorado.edu/display/fisid_100437)
Professor; PhD, New York University

Bhat, Yermal Sujeet (https://experts.colorado.edu/display/fisid_146506)
Instructor; PhD, University of Florida

Bortz, David Matthew (https://experts.colorado.edu/display/fisid_143348)
Associate Professor; PhD, North Carolina State University at Raleigh

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Corcoran, Jem (https://experts.colorado.edu/display/fisid_118142)
Associate Professor; PhD, Colorado State University

Cox, Murray William (https://experts.colorado.edu/display/fisid_153192)
Instructor; PhD, Texas AM University

Curry, James H (https://experts.colorado.edu/display/fisid_105730)
Professor; PhD, University of California-Berkeley

Dougherty, Anne Margaret (https://experts.colorado.edu/display/fisid_101349)
Senior Instructor; PhD, University of Wisconsin-Madison

Dukic, Vanja (https://experts.colorado.edu/display/fisid_148718)
Professor; PhD, Brown University

Easton, Robert
Professor Emeritus

Fornberg, Bengt (https://experts.colorado.edu/display/fisid_108048)
Professor; PhD, Univ of Uppsala (Sweden)

Grooms, Ian G (https://experts.colorado.edu/display/fisid_155588)
Assistant Professor; PhD, University of Colorado Boulder

Hoefer, Mark (https://experts.colorado.edu/display/fisid_154264)
Associate Professor; PhD, University of Colorado Boulder

Julien, Keith (https://experts.colorado.edu/display/fisid_108913)
Professor; PhD, University of Cambridge (England)

Kilpatrick, Zachary Peter (https://experts.colorado.edu/display/fisid_155782)
Assistant Professor; PhD, University of Utah

Kleiber, William Paul (https://experts.colorado.edu/display/fisid_151943)
Assistant Professor; PhD, University of Washington

Li, Congming (https://experts.colorado.edu/display/fisid_100647)
Professor; PhD, New York University

Lladser, Manuel Bosco (https://experts.colorado.edu/display/fisid_134170)
Associate Professor; PhD, Ohio State University

Manteuffel, Thomas A (https://experts.colorado.edu/display/fisid_102137)
Professor; PhD, University of Illinois at Urbana-Champaign

Martinsson, Per-Gunnar J (https://experts.colorado.edu/display/fisid_141180)
Professor; PhD, University of Texas at Austin

McCormick, Steven
Professor Emeritus

Meiss, James D (https://experts.colorado.edu/display/fisid_103702)
Professor; PhD, University of California-Berkeley

Meyer, Francois Georges (https://experts.colorado.edu/display/fisid_115559)
Professor; PhD, INRIA (France)

Norris, Jan Adam (https://experts.colorado.edu/display/fisid_101412)
Senior Instructor; PhD, University of Colorado Boulder

Restrepo, Juan G (https://experts.colorado.edu/display/fisid_145811)
Associate Professor; PhD, University of Maryland College Park Campus

Segur, Harvey (https://experts.colorado.edu/display/fisid_102287)
Professor; PhD, University of California-Berkeley

Zaharatos, Brian R (https://experts.colorado.edu/display/fisid_156225)
Instructor; MS, Colorado School of Mines

Courses

APPM 5120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: APPM 2130 or MATH 2135 or MATH 2135.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4120 and MATH 4120 and MATH 5120

Requisites: Restricted to graduate students only.

APPM 5350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems

Department enforced prerequisite courses: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course: APPM 3310 or MATH 2130 or MATH 2135.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4350

Requisites: Restricted to graduate students only.

APPM 5360 (3) Methods in Applied Mathematics: Complex Variables and Applications

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4360

Requisites: Restricted to graduate students only.

APPM 5380 (3) Modeling in Applied Mathematics

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4380

Requisites: Restricted to graduate students only.

Recommended: Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

APPM 5390 (3) Modeling in Mathematical Biology

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering. Department enforced prerequisites: APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 or instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4390

Requisites: Restricted to graduate students only.

APPM 5430 (3) Methods in Applied Mathematics: Applications of Complex Variables

Reviews basic ideas of complex analysis, including solutions of ODEs and PDEs of physical interest via complex analysis; conformal mapping, including Schwarz-Christoffel transformations and generalizations; computational methods; Riemann-Hilbert problems; topics in asymptotic methods. Department enforced prerequisite: APPM 4360 or APPM 5360.

Requisites: Restricted to graduate students only.

APPM 5440 (3) Applied Analysis 1

Discusses the elements of basic real and complex analysis, Banach spaces, L_p spaces and many relevant inequalities. Includes applications of existence and uniqueness of solutions to various types of ordinary differential equations, partial differential equations, and integral equations. Department enforced prerequisites: APPM 4440 and APPM 4450.

Requisites: Restricted to graduate students only.

APPM 5450 (3) Applied Analysis 2

Continuation of APPM 5440. Department enforced prerequisite: APPM 5440.

Requisites: Restricted to graduate students only.

APPM 5460 (3) Methods in Applied Mathematics: Dynamical Systems and Differential Equations

Introduces the theory and applications of dynamical systems through solutions to differential equations. Covers existence and uniqueness theory, local stability properties, qualitative analysis, global phase portraits, perturbation theory and bifurcation theory. Special topics may include Melnikov methods, averaging methods, bifurcations to chaos and Hamiltonian systems. Department enforced prerequisites: APPM 2360 and APPM 3310 and APPM 4440.

Requisites: Restricted to graduate students only.

APPM 5470 (3) Methods of Applied Mathematics: Partial Differential and Integral Equations

Studies properties and solutions of partial differential equations. Covers methods of characteristics, well-posedness, wave, heat and Laplace equations, Green's functions and related integral equations. Department enforced prerequisites: APPM 4350 or MATH 4470 and APPM 4360 or MATH 3450.

Requisites: Restricted to graduate students only.

APPM 5480 (3) Methods of Applied Mathematics: Approximation Methods

Covers asymptotic evaluation of integrals (stationary phase and steepest descent), perturbation methods (regular and singular methods, and inner and outer expansions), multiple scale methods and applications to differential and integral equations. Department enforced prerequisite: APPM 5470.

Requisites: Restricted to graduate students only.

APPM 5500 (3) Statistical Collaboration

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4500

Requisites: Requires a prerequisite course of APPM 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 5505 (2) Advanced Statistical Collaboration

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4505

Requisites: Requires prerequisite course of APPM 4500 or APPM 5500 (minimum grade C-).

Grading Basis: Letter Grade

APPM 5510 (3) Data Assimilation in High Dimensional Dynamical Systems

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4510

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 5520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: one semester calculus-based probability course, such as MATH 4510 or APPM 3570.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4520 and MATH 4520 and MATH 5520

Requisites: Restricted to graduate students only.

APPM 5530 (3) Stochastic Analysis for Finance

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4530

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 5540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: APPM 5520 or MATH 5520.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4540 and MATH 4540 and MATH 5540

Requisites: Restricted to graduate students only.

APPM 5550 (3) Spatial Statistics

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4550

Requisites: Requires prerequisite course of APPM 4520 or APPM 5520 or MATH 4520 or MATH 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 5560 (3) Markov Processes, Queues, and Monte Carlo Simulations

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4560

Requisites: Restricted to graduate students only.

APPM 5570 (3) Statistical Methods

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4570

Requisites: Restricted to graduate students only.

APPM 5580 (3) Introduction to Statistical Learning

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4580

Requisites: Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-). Restricted to graduate students only.

APPM 5590 (3) Statistical Modeling

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software. Department enforced prerequisite: APPM 4570 or APPM 4520 or MATH 4520 or instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4590

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 5600 (3) Numerical Analysis 1

Solution of nonlinear algebraic equations, interpolation, integration, approximation, and numerical linear algebra. Department enforced prerequisite: APPM 3310 or MATH 2130 and experience with a scientific programming language.

Requisites: Restricted to graduate students only.

APPM 5610 (3) Numerical Analysis 2

Numerical linear algebra, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: APPM 5600 or MATH 5600.

Requisites: Restricted to graduate students only.

APPM 5720 (1-3) Open Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4720

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

APPM 6470 (3) Advanced Partial Differential Equations

Continuation of APPM 5470. Advanced study of the properties and solutions of elliptic, parabolic, and hyperbolic partial differential equations. Topics include the study of Sobolev spaces and variational methods as they relate to PDEs, and other topics as time permits. Department enforced prerequisite: APPM 5470.

Requisites: Restricted to graduate students only.

APPM 6520 (3) Mathematical Statistics

Emphasizes mathematical theory of statistics. Topics include distribution theory, estimation and testing of hypotheses, multivariate analysis, and nonparametric inference, all with emphasis on theory. Department enforced prerequisite: APPM 5520 or MATH 5520.

Requisites: Restricted to graduate students only.

APPM 6550 (3) Introduction to Stochastic Processes

Systematic study of Markov chains and some of the simpler Markov processes including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences.

Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560 or instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: MATH 6550

Requisites: Restricted to graduate students only.

APPM 6610 (3) Introduction to Numerical Partial Differential Equations

Covers finite difference, finite element, finite volume, pseudo-spectral, and spectral methods for elliptic, parabolic, and hyperbolic partial differential equations. Department enforced prerequisite: APPM 5600.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite APPM 5610 or graduate numerical linear algebra.

APPM 6640 (3) Multigrid Methods

Develops a fundamental understanding of the principles and techniques of the multigrid methodology, which is a widely used numerical approach for solving many problems in such diverse areas as aerodynamics, astrophysics, chemistry, electromagnetics, hydrology, medical imaging, meteorology/oceanography, quantum mechanics, and statistical physics.

Requisites: Restricted to graduate students only.

APPM 6900 (1-6) Independent Study

Introduces graduate students to research foci of the Department of Applied Mathematics.

Requisites: Restricted to graduate students only.

APPM 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

APPM 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

APPM 7100 (3) Mathematical Methods in Dynamical Systems

Covers dynamical systems defined by mappings and differential equations. Hamiltonian mechanics, action-angle variables, results from KAM and bifurcation theory, phase plane analysis, Melnikov theory, strange attractors, chaos, etc.

Requisites: Requires prerequisite course of APPM 5460 (minimum grade D-). Restricted to graduate students only.

APPM 7300 (3) Nonlinear Waves and Integrable Equations

Includes basic results associated with linear dispersive wave systems, first-order nonlinear wave equations, nonlinear dispersive wave equations, solitons, and the methods of the inverse scattering transform. Department enforced prerequisites: APPM 4350 and APPM 4360.

Requisites: Restricted to graduate students only.

APPM 7400 (1-3) Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics with the potential of being incorporated into the core courses in applied mathematics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

APPM 7900 (1-3) Independent Study

Introduces graduate students to research foci of the Department of Applied Mathematics.

Requisites: Restricted to graduate students only.

APPM 8000 (1) Colloquium in Applied Mathematics

Introduces graduate students to the major research foci of the Department of Applied Mathematics.

Requisites: Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8100 (1) Seminar in Dynamical Systems

Introduces advanced topics and research in dynamical systems.

Requisites: Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8300 (1-3) Nonlinear Waves Seminar

Introduces the core methods in the analysis of nonlinear partial differential and integral equations or systems to graduate students.

Provides a vehicle for the development, presentation, and corporative research of new topics in PDE and analysis.

Requisites: Requires prerequisite course of APPM 5440 (minimum grade D-). Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8400 (1) Mathematical Biology Seminar

Introduces advanced topics and research in mathematical and computational biology. Instructor consent required.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 8500 (1) Statistics, Optimization and Machine Learning Seminar

Research-level seminar that explores the mathematical foundations of machine learning, in particular how statistics and optimization give rise to well-founded and efficient algorithms.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 8600 (1) Seminar in Computational Mathematics

Introduces advanced topics and research in computational mathematics.

Requisites: Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. No more than 10 credit hours may be taken in any one semester.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Applied Mathematics - Master of Science (MS)

The MS degree can serve as a steppingstone for any student considering a PhD program at CU Boulder or elsewhere. However, the MS degree is unique and an important program in its own right. One of the principal advantages is in preparation for teaching or industry, which is the genesis

of the required numerical analysis and out-of-department sequences. It is also a flexible program that supports special interest directions.

Students should carefully read the Requirements for Advanced Degrees in the Graduate School section. What follows is an abbreviated summary of specific requirements for the department. A precise description of the degree requirements is available in the department's Applied Mathematics Graduate Student Supplement (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>).

Optional Computational Science and Engineering Track

The purpose of this track is to meet the needs of students who want to learn the basic concepts and skills of computational science and engineering, and then to continue toward a PhD in a discipline outside applied mathematics. The program is designed to provide interested students with a foundation in computational mathematics and, at the same time, to allow sufficient latitude for the student to become proficient in an outside discipline. Approximately half of the credit hours for the master's degree will be taken from a department other than applied mathematics.

A student in the computational science and engineering track will be enrolled simultaneously in two graduate programs, one in applied mathematics and one in the department from which the student wishes to receive a PhD. An interested student may apply for admission to this track either when applying for graduate study at CU, or at any time in the student's first two years of graduate study. First-year and second-year graduate students in any of the participating departments may apply for admission to this program. A student who completes this program successfully will obtain a master's degree in applied mathematics in the computational science and engineering track.

Concurrent Degree Program BS/MS in Applied Mathematics

The concurrent BS/MS program in applied mathematics enables well-qualified and motivated students to experience graduate-level course work earlier in their education and to obtain an MS degree in a reduced time period. Applied math majors may apply for this program during their junior year. Minimum requirements for admission include completion of at least two APPM courses numbered 3000 or higher, an overall GPA of 3.40 or higher, an APPM and MATH GPA of 3.40 or higher, and two letters of recommendation from APPM faculty. Students interested in this program are encouraged to consult with an applied mathematics faculty advisor early in their undergraduate career.

Dual Degree Program MS/MA in Applied Mathematics and MCDB

This three-year interdisciplinary program offers two master's degrees: an MS in applied mathematics and an MA in molecular, cellular and developmental biology (MCDB). The goal of the program is to produce well-trained applied mathematics students who are capable of making serious contributions leading to advancements in molecular biology. Such students will be well educated in computational sciences, statistics, probability and molecular biology.

Students are expected to meet all requirements for admission to the graduate program in the Department of Applied Mathematics and to possess a basic science background suitable for pursuit of this dual

degree. Students also are expected to meet minimum requirements for admission to the graduate program in MCDB. Adequate undergraduate preparation consists of successful completion of basic courses on cell and molecular biology. Any student deemed deficient in either area will be required to take Molecular Cell Biology I and II (MCDB 3135 and MCDB 3145) after enrollment.

Students will be required to apply to both programs, with APPM the primary one. Subject to joint recommendation and approval by APPM and MCDB, incoming students will be admitted to this dual degree program as a regular part of the applied mathematics recruitment process.

Requirements

Prerequisites

Prerequisites for graduate study in applied mathematics include three semesters of calculus and a course in differential equations and linear algebra. The overall grade point average for mathematics and applied mathematics must be B or better.

Other strongly recommended courses are:

Strongly Recommended Prerequisites

APPM 4350 & APPM 4360	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems and Methods in Applied Mathematics: Complex Variables and Applications	6
APPM 4650 & APPM 4660	Intermediate Numerical Analysis 1 and Intermediate Numerical Analysis 2 (or MATH 4650 & MATH 4660)	6
APPM 4440	Undergraduate Applied Analysis 1	3
One of the following:		3
APPM 3310	Matrix Methods and Applications	
MATH 2130	Introduction to Linear Algebra for Non-Mathematics Majors	

Course Requirements

The department requires a master's degree candidate to complete an approved program of study consisting of at least 30 credit hours, at least 18 of which must be applied mathematics courses at the 5000 level or above. A grade of C (2.0) or higher must be attained in each course.

Generally, the following courses do not count toward the 30-credit-hour requirement: APPM 5350, APPM 5360, APPM 5570 and APPM 5720.

NOTE: The APPM 5720 course number is used for a variety of courses that are either run for the first time or on an ad hoc basis. When appropriate, the Graduate Committee may decide that a particular version of this course should count towards graduate credits. If a student would like to count credits from APPM 5720 toward an APPM graduate degree, advice should be sought from the chair of the graduate committee on whether this would be permissible.

All master's degree students must complete two yearlong 5000-level course sequences in applied mathematics:

- APPM 5600 & APPM 5610 (required; may be waived for students who obtain a pass on the numerical analysis preliminary exam) AND
- a sequence listed in the "Graduate Courses" section of the Applied Mathematics Graduate Student Supplement (<http://www.colorado.edu/amath/prospective-students/graduate/>)

supplement-course-catalog-degree-requirements) (other sequences require approval from the chair of the graduate committee).

MS candidates must take a yearlong 5000-level graduate sequence outside of applied mathematics in an area where mathematics has significant application. This sequence must be approved by the chair of the graduate committee.

Upon approval by petition to the graduate committee, up to 6 credit hours may be taken in 4000-level courses in other departments, provided members of the graduate faculty teach those courses.

Degree Plans

There are two courses of action for graduate students who are looking to graduate with a master's degree.

Plan I: Thesis Option

A student electing to do a thesis must enroll in 4–6 hours of thesis credit, which count toward the required 30 hours, and must take an oral comprehensive exam (also referred to as a defense) on that thesis work. A student can only enroll in a total of 6 thesis hours for the course of the degree program. This exam will be administered by a committee consisting of the faculty advisor, who serves as committee chair, and two other faculty members. Each committee member must hold a current graduate faculty appointment. The chair must have a regular graduate faculty appointment, and the remaining committee members must hold either regular or special membership. At least one committee member must hold a regular (tenure or tenure-track) faculty appointment in Applied Mathematics.

Plan II: Non-Thesis Option

A student choosing the non-thesis option must pass ("pass" or "PhD research pass") any one of four PhD preliminary exams. Details are provided in the Applied Mathematics Graduate Student Supplement (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>).

Each MS student electing the non-thesis option must submit a completed MS degree audit form to the graduate chair upon submitting the Candidacy Application for an Advanced Degree.

A student who fails a written preliminary exam may, in a later semester, make one and only one more attempt to satisfy this requirement. In doing so, the student may switch between the thesis and the non-thesis option of the program, or between one preliminary exam area and another. Students who fail two preliminary exams are subject to dismissal from the program.

Applied Mathematics - Doctor of Philosophy (PhD)

The Department of Applied Mathematics offers course work and research leading to the PhD degree in applied mathematics. The aim of the department is to train graduate students to perform independent research on the methods and applications of applied mathematics. Research areas represented in the department include:

- physical applied mathematics
- dynamical systems
- nonlinear phenomena and analysis
- mathematical biology
- computational mathematics

- applied probability, statistics and data science

For more information on the department and degree requirements, download the supplement to the catalog (<http://www.colorado.edu/amath/prospective-students/graduate/supplement-course-catalog-degree-requirements>) or visit the Applied Mathematics (<http://www.colorado.edu/amath>) website.

PhD with Certificate in Interdisciplinary Quantitative Biology

Applied mathematicians interested in collaborations with bioscientists will need a breadth of knowledge in quantitative bioscience to be successful. The interdisciplinary quantitative biology (IQ biology) graduate certificate (p. 1278) program emphasizes training at the intersection of biochemistry, biology, computer science, engineering, applied mathematics and physics. The PhD in applied mathematics with a certificate in IQ biology will strengthen this training with additional foundations in numerical and mathematical analysis, probability and statistics, mathematical biology and network analysis.

Candidates interested in this program should apply directly to IQ biology and select applied mathematics as one of their graduate programs of interest. In addition to satisfying the requirements for the PhD in applied mathematics, students in this program must take 12 credit hours in three IQ biology core courses (Quantitative Biology Foundations, Statistics and Computations for Genomes and Meta-Genomes and Forces in Biology), which can serve as the out-of-department sequence for the PhD, as well as three 10-week rotations in labs associated with the IQ biology program.

For more information, visit the BioFrontiers Institute's IQ Biology PhD Program (<http://iqbiology.colorado.edu>) website.

Requirements

A minimum of 60 credit hours is required for the degree, including 30 credit hours in courses numbered 5000 or above (APPM 5350, APPM 5360, APPM 5570 and APPM 5720 generally do not count toward this requirement) and 30 credit hours of applied math dissertation credit.

A grade of B- or higher must be attained in each course. PhD students must maintain a grade point average of 3.0 or better each semester.

Required Courses and Semester Credit Hours

Required Courses

APPM 5440 & APPM 5450	Applied Analysis 1 and Applied Analysis 2 ¹	6
APPM 5600 & APPM 5610	Numerical Analysis 1 and Numerical Analysis 2 ¹	6
APPM 8990	Doctoral Dissertation	30

Electives

One sequence in applied mathematics; possibilities include:		6
APPM 5470 & APPM 5430	Methods of Applied Mathematics: Partial Differential and Integral Equations and Methods in Applied Mathematics: Applications of Complex Variables	
or APPM 5460	Methods in Applied Mathematics: Dynamical Systems and Differential Equations	
or APPM 5480	Methods of Applied Mathematics: Approximation Methods	

APPM 5520 & APPM 5540	Introduction to Mathematical Statistics and Introduction to Time Series	
or APPM 5560	Markov Processes, Queues, and Monte Carlo Simulations	
Two semesters of seminars: ²		2
APPM 8000	Colloquium in Applied Mathematics	
APPM 8100	Seminar in Dynamical Systems	
APPM 8300	Nonlinear Waves Seminar	
APPM 8400	Mathematical Biology Seminar	
APPM 8500	Statistics, Optimization and Machine Learning Seminar	
APPM 8600	Seminar in Computational Mathematics	
At least one 3-credit course per year (third and fourth years only) in applied mathematics at the 6000 level or above. ³		6
A yearlong graduate sequence outside of applied mathematics in an area where mathematics has significant application. Approval of the sequence from the graduate committee chair is required.		6
Total Credit Hours		62

¹ A student may opt out of either one of these two sequences only if they have demonstrated proficiency in the subject by passing the corresponding preliminary exam.

² To be taken no earlier than the second year of graduate study in the department.

Exams

Preliminary exams are offered in four areas: analysis, numerics, partial differential equations and probability/statistics. Students must take the numerics and analysis exams, and either one of the other two.

Art and Art History

The Department of Art and Art History offers two graduate degrees, the MA in Art History and the MFA in Art Practices, as well as the MFA/MBA in collaboration with the Leeds School of Business. The MA in Art History is intended to give students a broad general knowledge of Art History in a two-year program. Students who have achieved a distinguished record in this MA program should be well prepared for acceptance into a doctoral program in Art History.

The MFA in Art Practices is a rigorous program intended for artists committed to pursuing a professional life in the arts and prepares students for careers as practicing artists and arts professionals as well as teachers in colleges, universities, and art schools. During the two and half-year program, students focus on one of several fields including, Ceramics, IMA (photography, digital media, video, integrated arts), Painting and Drawing, Printmaking, Sculpture and Post-Studio Practice. Additionally, in collaboration with the Film Studies Program, the Department of Art and Art History offers a film track MFA. The MFA/MBA program requires candidates to submit separate applications to the Department of Art and Art History as well as the Leeds School of Business. In addition to the required coursework, MFA and MA students gain additional insights about their respective fields through the Visiting Artist Program and Visiting Scholars Program, both of which invite distinguished artists and scholars to CU for talks, seminars, and individual meetings with students.

The faculty are highly active in their respective fields, from publishing important articles and books on historical and contemporary art to exhibiting in galleries and museums to establishing non-traditional artist

venues and opportunities. The faculty are also committed teachers and mentors who work closely with graduate students, helping them to realize their individual visions as artists and historians.

Students who are accepted to the MA, MFA, and MFA/MBA programs join the University of Colorado-Boulder Graduate School, which serves the community of graduate students, faculty, and staff, one of the nation's premier comprehensive research universities. The Graduate School offers guidance on a wide array of academic, social, and financial issues, and can assist in navigating the often complex world of graduate education.

Serving as an umbrella organization since 1892, the Graduate School currently oversees 100 graduate and professional programs. The Graduate School works to guarantee a standard of quality and cohesion across all disciplines, ensuring the continuing integrity and value of a CU-Boulder graduate degree. The Graduate School also helps make possible the many connections between the campus and outside constituencies, in the state, the nation, and the world.

Course codes for these programs are ARTE, ARTH and ARTS.

Special Programs

The CU Art Museum

The CU Art Museum is a cultural gateway to the University of Colorado Boulder, facilitating engagement with larger societal issues through a greater understanding of the arts in a global context. The CU Art Museum is committed to enhancing understanding and appreciation of the visual arts within the academic community and among regional, national and international audiences. It provides access to art of the highest quality through exhibitions, publications and related educational events that reflect diversity, critical thinking and creative research. The museum also facilitates student training in museum practices. As a collecting institution, the CU Art Museum promotes the excellence, preservation, scholarly interpretation, exhibition and growth of its comprehensive permanent collection, which includes artworks from numerous time periods, artistic traditions and cultures. The new 25,000-square-foot CU Art Museum contains five galleries including permanent collection galleries, changing exhibition galleries and a video gallery. The CU Art Museum also includes a collections study center, allowing students, faculty and researchers the opportunity to schedule appointments to view, research and study works in its permanent collection.

The CU Art Museum's Permanent Collection

The Permanent Collection of the CU Art Museum contains over 6,000 works of art. The collection includes works from numerous time periods and cultures including ancient Greek pottery, Roman Glass, ancient Iranian pottery, Southwestern and South American santos, Southeast Asian pottery, African sculpture, Old Master works on paper, British 18th century prints, 19th and 20th century American prints and paintings, Japanese *ukiyo-e* prints, 19th century photography, Pop art, Minimalist works on paper and modern and contemporary ceramics, sculpture, works on paper, paintings, photography, video and new media art.

Visiting Scholar Program

This program is organized to explore the discipline of art history-its cultural connections, methodological pursuits and its changing nature-by focusing extensively on the research and insights of individual academic experts. Three to five highly regarded art historians and/or art critics speak at a public lecture, presenting current research and published papers. During their week-long visit they work closely with students enrolled in the Visiting Scholar Seminar.

Visiting Artist Program

Artists of national and international reputation interact with graduate and advanced undergraduate students and discuss their studio work at seminar meetings. Artists present a public lecture during their visit, providing continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

Visual Resources Center (VRC)

The mission of the VRC is to provide and facilitate access to images, imaging and related information resources for teaching and research in the Department of Art and Art History. This includes: 1) a departmental image collection and support for other important image resources; 2) resources, training and support in digital imaging and image presentation software; and 3) equipment for use in creative work, documentation and classrooms within the department. The digital image collection contains works by faculty, MFA thesis recipients, visiting artists and other contemporary and historical works. Digital imaging resources include slide and flatbed scanning stations, with training available in digitization standards and best practices. VRC equipment includes laptops, data projectors, digital SLR cameras, video cameras, tripods and other equipment for use in the department. The VRC also circulates its collection of DVDs containing lectures and interviews from the department's Visiting Artist Program. More information is available at cuart.colorado.edu/resources/vrc (<http://cuart.colorado.edu/resources/vrc>).

Master's Degrees

- Art History - Master of Arts (MA) (p. 901)
- Art Practices - Master of Fine Arts (MFA) (p. 903)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Alhadeff, Albert (https://experts.colorado.edu/display/fisid_100711)
Associate Professor; PhD, New York University

Ambrose, Kirk T (https://experts.colorado.edu/display/fisid_115914)
Professor; PhD, University of Michigan Ann Arbor

Amerika, Mark (https://experts.colorado.edu/display/fisid_116523)
Professor; MFA, Brown University

Beitz, Michael D (https://experts.colorado.edu/display/fisid_156062)
Assistant Professor; MFA, SUNY at Buffalo

Brown, Marilyn Ruth (https://experts.colorado.edu/display/fisid_143782)
Professor; PhD, Yale University

Chamberlin, H Scott (https://experts.colorado.edu/display/fisid_105456)
Professor; MFA, New York State Col of Ceramics at Alfred Univ

Charteris, Frances (https://experts.colorado.edu/display/fisid_100730)
Lecturer; MFA, University of California-San Diego

Chong, Albert (https://experts.colorado.edu/display/fisid_100586)
Professor; MFA, University of California-San Diego

Cline, Clinton C.
Professor Emeritus

Cordova, James M. (https://experts.colorado.edu/display/fisid_146415)
Associate Professor; PhD, Tulane University of Louisiana

Day, Robert E.
Professor Emeritus

de Stecher, Annette W (https://experts.colorado.edu/display/fisid_155095)
Assistant Professor; PhD, Carleton University (Canada)

Dickey, Kimberly (https://experts.colorado.edu/display/fisid_115735)
Professor; MFA, New York State Col of Ceramics at Alfred Univ

Duresse-Stimilli, Françoise (https://experts.colorado.edu/display/fisid_144418)
Associate Professor; MFA, Temple University

Eades, Luis E.
Professor Emeritus

Ecker, Robert R.
Professor Emeritus

Farago, Claire Joan (https://experts.colorado.edu/display/fisid_101552)
Professor; PhD, University of Virginia

Forsman, Charles S.
Professor Emeritus

Foster, Suzanne R.
Professor Emeritus

Frost, Steven Earl (https://experts.colorado.edu/display/fisid_156502)
Instructor

Geck, Francis J.
Professor Emeritus

Gregorio, Alvin P (https://experts.colorado.edu/display/fisid_143596)
Associate Professor; MFA, Claremont Graduate School

Haynes, Deborah J.
Professor Emeritus

Iwamasa, Ken
Professor Emeritus

Kunkel, Jerry W.
Professor Emeritus

Miller, Kay
Professor Emeritus

Minor, Vernon H.
Professor Emeritus

Nauman, Robert (https://experts.colorado.edu/display/fisid_106835)
Senior Instructor; PhD, University of New Mexico

Potter, Thomas J.
Professor Emeritus

Qualley, Charles A.
Professor Emeritus

Quinn, Jeanne (https://experts.colorado.edu/display/fisid_111658)
Associate Professor; MFA, University of Washington

Rivera, George F (https://experts.colorado.edu/display/fisid_103055)
Professor; PhD, SUNY at Buffalo

Roth, Yumi J (https://experts.colorado.edu/display/fisid_126287)
Associate Professor; MFA, SUNY College at New Paltz

Sampson, John Franklin
Professor Emeritus

Saxton, Richard W (https://experts.colorado.edu/display/fisid_144756)
Associate Professor; MFA, Indiana University Bloomington

Stevens, Charlene (https://experts.colorado.edu/display/fisid_143589)
Associate Professor; MFA, Indiana University Bloomington

Sweetman, Alex John (https://experts.colorado.edu/display/fisid_100531)
Associate Professor; MFA, SUNY at Buffalo

Theodore, Michael (https://experts.colorado.edu/display/fisid_113318)
Associate Professor; PhD, University of California-San Diego

Valdovino, Luis Hector (https://experts.colorado.edu/display/fisid_101863)
Professor; MFA, University of Illinois at Urbana-Champaign

van Lil, Kira (https://experts.colorado.edu/display/fisid_145210)
Assistant Professor; PhD, Ludwig-Maximilians Univ of Munich (Germany)

Vandersall, Amy L.
Professor Emeritus

Walker, Melanie (https://experts.colorado.edu/display/fisid_101750)
Associate Professor; MFA, Florida State University

Wilson, John B.
Professor Emeritus

Wolfe, Lynn Robert
Professor Emeritus

Womack, Mike Fitzgerald (https://experts.colorado.edu/display/fisid_148502)
Assistant Professor; MFA, Pratt Institute

Woodman, Elizabeth A.
Professor Emeritus

Woodman, George E.
Professor Emeritus

Yazzie, Melanie A. (https://experts.colorado.edu/display/fisid_143620)
Professor; MFA, University of Colorado Boulder

Courses

ARTF 5000 (3) Advanced Digital Postproduction

Explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio and optical effects treatments. Cannot be taken simultaneously with FILM 3400 or FILM 3600.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4000

Requisites: Requires prerequisite courses of FILM 2500 and FILM 3400 or FILM 3600 and FILM 1502 and FILM 2000 or FILM 2300 (all minimum grade (D-)).

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5003 (3) Film and Literature

Explores similarities and differences between literature and film as narrative arts. Studies novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4003

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5004 (3) Topics in Film Theory

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4004 and HUMN 4004

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 3051 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5010 (1-3) Topics in Film Studies-Production

Prepares students for advanced Film Studies production courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4010

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5013 (3) Film, Photography and Modernism

Provides interdisciplinary study of film, photography and modernism, focusing on issues such as dystopia, alienation, sexuality, subjectivity and self-referentiality. Photographs by Stieglitz, Strand, Weston, Evans, Cartier-Bresson, Kertesz and Moholy-Nagy. Films by Dziga-Vertov, Eisenstein, Resnais, Antonioni, Bergman, Bunuel and Bertolucci.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4013

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5021 (3) Directing/Acting for the Camera

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research, and papers required.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4021

Requisites: Restricted to graduate students only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5023 (3) Topics in International Cinema

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4023

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to graduate students only.

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5024 (3) Advanced Research Seminar

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4024

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5030 (3) Visiting Filmmakers Seminar

Examines creative issues in contemporary cinema art. Graduate and advanced undergraduate students explore filmmaking ideas with guest artists within a seminar setting. Filmmakers, videographers and programmers of national and international reputation, with an emphasis on "experimental" practice, interact with graduate and advanced undergraduate students and discuss their work at seminar meetings, public lectures or events.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites FILM 1502 and FILM 4453 or instructor consent required.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5043 (1-3) Topics in Film Studies-Critical Studies

Prepares students for advanced Film Studies critical studies courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4043

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5105 (3) Advanced Screenwriting

Introduces professional screenwriting, in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio. Department enforced prerequisite: approved writing sample.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4105

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5200 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4200 and MCEN 4151 and MCEN 5151

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5400 (3) Digital Post-Production

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4400

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5453 (3) Elective Affinities: Avant-Garde Film and the Arts

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4453

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5500 (3) Cinema Production 2

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production exploring either documentary, experimental, or narrative genres.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4500

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of FILM 3400 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5600 (3) Creative Digital Cinematography

Explores creative approaches to single camera digital cinematography through short projects, discussions and screenings. Relates creative photography and poetic approaches to the digital camera cinema.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4600

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 2000 and FILM 3600 or ARTS 4246 or ARTS 5346 (all minimum grade D-). Restricted to Film Studies (FILM) majors only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5604 (3) Colloquium in Film Aesthetics

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4604

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5610 (3) Image-makers Graduate Seminar

Explores advanced graduate studio work in a seminar setting. Focuses on the development of ideas and activities which advance creative image making.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5717 (1-3) Graduate Studio Critique

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5846 (1-3) Graduate Independent Study-Video

Participate in graduate independent study.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5857 (1-3) Graduate Independent Study

Participate in graduate independent study.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 6959 (1-6) Master's Thesis Film

Preparation, research, writing of critical studies Master's thesis in fulfillment of concurrent BAMA in Film.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTF 5004 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTH 5029 (1) Art History Research Methods

Learn to expertly navigate art scholarship and be prepared to do thesis-level research. An introduction to the vast array of art historical resources and their uses. Explore advanced techniques for searching both online and offline sources of art information. Master the various modes of art historical research, including finding iconographic, historical, or technical information.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4029 and LIBR 4029

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5109 and ARTH 4109 and ARTH 5109

Additional Information: Departmental Category: Art History

ARTH 5119 (3) Roman Sculpture

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4119 and CLAS 4119 and CLAS 5119

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4139 and CLAS 4139 and CLAS 5139

Additional Information: Departmental Category: Art History

ARTH 5159 (3) Hellenistic Art and Archaeology

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5159

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4169 and CLAS 4169 and CLAS 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 5179 (3) City of Athens

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periklean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5179

Additional Information: Departmental Category: Art History

ARTH 5189 (3) City of Rome

Explores in detail the architecture, sculptures, coins, frescos and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5189

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4229 and CLAS 4229 and CLAS 5229

Additional Information: Departmental Category: Art History

ARTH 5269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire', Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4269 CLAS 4269 and CLAS 5269

Additional Information: Departmental Category: Art History

Departmental Category: Asia Content

ARTH 5909 (1-3) Graduate Independent Study---Art History

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5929 (1-3) Special Topics in Art History

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4929

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

Additional Information: Departmental Category: Art History

ARTH 5939 (3-6) Art Museum Internship

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4939

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 5949 (3) Visiting Scholars Seminar

Brings speakers to campus to work with seminar students, usually four guest scholars per semester, subjects vary. Students read scholar's work and discuss methodological issues. Focuses on the research and insight of scholars who are currently shaping the field and defining research agendas. Required for all MA art history students, open to others.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5959 (3) Introduction to Critical Theory for Visual Studies

Provides overview for critical theory from Marx to contemporary writers with emphasis on their relevance to visual studies. Addresses issues that underlie a wide range of academic discussion in arts and sciences. Foucault, Derrida, Said, Lacan and other authors will be subject to weekly discussions leading to research papers, presentations, and projects. Class fulfills critical theory requirement for MFA and MA students.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 6150 (3) Critical and Theoretical Issues in Museums

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 6150 and HIST 6150 and ANTH 6150

Requisites: Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 6929 (3) Seminar: Theories of Art History

Provides a systematic critical overview of the development of art history as a discipline beginning with 18th century theories of aesthetics and ending with current interdisciplinary models of critical interpretation. Weekly readings, discussions, reports, and written papers constitute the format of this seminar in methodology. Topics vary from semester to semester. Required for MA (art history) students.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

Additional Information: Departmental Category: Art History

ARTH 6939 (3) Graduate Seminar: Open Topics in Art History

Subjects and topics vary.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.

Additional Information: Departmental Category: Art History

ARTH 6949 (1) Master's Candidate for Degree

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Art History

ARTH 6959 (1-6) Master's Thesis (Art History)

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 6969 (1-6) Master's Project (Art History)

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Art History

ARTS 5017 (1-3) Special Topics in Studio Arts

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4017

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5024 (3) Public Art

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4024

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5075 (3) Graduate Ceramics

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ceramics

ARTS 5087 (3) Selected Topics in Contemporary Art

Selectively studies significant areas of visual art of the last decade including major critical opinions.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4087

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5095 (3) Graduate Special Topics in Ceramics

Designed for students majoring in ceramics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4095

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ceramics

ARTS 5097 (1-3) Special Topics-Non-Studio

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4097

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5104 (3) Graduate Performance/Installation

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4104

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5107 (1-3) Special Topics

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5117 (3) Graduate Art Seminar

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5118 (3) Graduate Visiting Artist Program

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4118

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Visiting Artist Program

ARTS 5126 (3) Graduate Digital Art 2

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4126

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5130 (3) Integrated Media

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4130

Additional Information: Departmental Category: Integrated Arts

ARTS 5140 (3) Integrated Arts Studio

Explores the creative process through a series of conceptually-based studio exercises. Students are encouraged to work across traditional media boundaries as they address themes such as identity, place, spirituality, politics, and consumerism. Includes individual and collaborative studio projects, as well as reading and writing about the course themes.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Integrated Arts

ARTS 5150 (3) Graduate Integrated Arts

Investigates the conjunction of interdisciplinary concepts in the creation of art. Looks beyond traditional media to new sources for art-making. A curious intellect, combined with exceptional research skills, will be the basis for original writing and rigorous discussion.

Repeatable: Repeatable for up to 18.00 total credit hours.

Additional Information: Departmental Category: Integrated Arts

ARTS 5154 (3) Metalsmithing 1

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4154

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5161 (3) Graduate Photography

Repeatable: Repeatable for up to 18.00 total credit hours.

Additional Information: Departmental Category: Photography

ARTS 5171 (3) New Directions in Photography

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4171

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Photography

ARTS 5176 (3) Graduate New Directions in Digital Art

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4176

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5196 (3) Graduate Advanced Photo-Imaging

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4196

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Media Arts

ARTS 5202 (3) Graduate Painting

Repeatable: Repeatable for up to 18.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 5217 (3) Art and Race/Ethnicity

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4217

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5226 (3) Graduate Advanced Computer Imaging

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4226

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 5126 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 5236 (3) Graduate Electronic Arts Survey 2

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4236

Additional Information: Departmental Category: Media Arts

ARTS 5246 (3) Graduate Beginning Video Production

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4246 and FILM 4240

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5303 (3-18) Graduate Relief

Continues the study of the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages. Students with limited experience in relief processes will be given an overview in those practices.

Repeatable: Repeatable for up to 18.00 total credit hours.

Requisites: Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 5316 (3) Graduate History and Theory of Digital Arts

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4316

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5327 (3) Biennial Art

Covers art represented in the most current international biennials (Documenta, Venice Bienale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4327

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5346 (3) Graduate Intermediate Video Production

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4346 and FILM 4340

Requisites: Requires prerequisite course of ARTS 4246 or ARTS 5246 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5403 (3) Graduate Intaglio

Continuation of the study of expressive and formal aesthetics of Intaglio processes. Studio practice and investigation of artistic attitudes as exemplified through historical perspectives, traditional, and contemporary usages. Building a body of work in this course is the goal. Taught with ARTS 3403 and ARTS 4403.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5413 (3) Graduate Lithography

Taught with ARTS 3413 and ARTS 4413.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5423 (3) Graduate Screen Printing

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5433 (3) Graduate Alternative Printmaking (Non-Toxic)

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4433

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5444 (6) Art and Rural Environments Field School

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place, and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4444

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5446 (3) Graduate Advanced Video Production

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4446 and FILM 4440

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5453 (3) Graduate Monotype Printing

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4453

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5457 (3) Sound Art Seminar

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4457

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5504 (3) Graduate Sculpture

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5540 (3) Generative Art

Attends to the interdisciplinary pursuits of scientists, humanists and anyone interested in creating works of visual art according to step by step procedures as in musical compositions, mathematical formulae, linguistic rules, computer programs, etc. Includes collaborative and individual projects.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Integrated Arts

ARTS 5607 (3) Art and Social Change

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4607

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5717 (1-3) Graduate Studio Critique

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5857 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5901 (1-3) Graduate Independent Study---Photography

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Photography

ARTS 6957 (1-6) Master of Fine Arts Creative Thesis

Additional Information: Departmental Category: Seminars/Special Topics

Art History - Master of Arts (MA)

The art history program at CU Boulder gives students an interdisciplinary foundation in the history of art to prepare them for careers as scholars, museum professionals and related creative professions in the history of art. Its main objective – through graduate seminars, teaching

opportunities, museum internships and scholarly fieldwork – is to foster critical thinking about contemporary and historical forms of art as well as visual and material culture.

Students develop their specialized interests from a combination of individual mentoring and collaborative approaches to intellectual inquiry. The program offers a supportive environment committed to debate and experimentation applicable to a variety of career choices. Graduates typically regard their two years in the art history master's program as a formative period of intellectual growth and professional experience.

Our diverse faculty offers a constantly changing curriculum of seminar topics geared to highlight current research, and a strong foundation in critical historiography and contemporary critical theory. Students in our interdisciplinary program also take advantage of exciting course offerings in cultural anthropology, classics, history, a wide range of literature programs, ethnic studies, gender and women's studies, art practices, and new media.

Our intimate atmosphere offers exceptional opportunities to work with permanent faculty and distinguished art historians from other institutions through our Visiting Scholars program. This longstanding feature of our graduate curriculum brings four to six leading scholars to campus every year to present their current work in a graduate seminar, public lecture and informal events.

Areas of specialization include: medieval art, Renaissance art and art theory, Latin American, Native North American, modern art and architecture, contemporary art and critical theory.

Concurrent Degree Program BA/MA in Art History

This program is open only to students enrolled in the BA art history degree program at CU Boulder.

It is expected that the BA/MA program be completed within five years. Both degrees, BA and MA, are awarded simultaneously upon meeting all the requirements for each degree. Six credit hours (two courses) may be shared between the two programs:

1. one course outside the Department of Art and Art History at the 3000 level or above
2. ARTH 6929

There is a formal application process with letters of recommendation, statement of intent, transcripts, GRE scores and a writing sample, as required for the two-year MA program. Students must have a minimum overall GPA of 3.00 and a GPA of 3.60 or above in the major of art history at the time of application. They take the GRE and formally apply to the graduate program during the second semester of their third (junior) year and begin taking graduate courses in the first semester of their fourth (senior) year. By the end of the fourth year, students must complete the language requirement of at least three progressive semesters at the college level or above, in a language appropriate to their studies.

During the second semester of their senior year, students should select a thesis advisor from among the art history faculty. This faculty member will direct the student's thesis and chair the student's mid-program review committee. Students will be evaluated through a mid-program review during the last two weeks of April of their senior year. This is the equivalent of the first year review in the two-year MA program. It focuses on a review of student course work and performance, on selecting the

major and minor areas of study in preparation for the comprehensive exam (see below) and on selection of a thesis topic.

Students will register for thesis hours during the second semester of their fifth year, pending successful completion of the comprehensive exam and approval of their thesis abstract. They will take the comprehensive exam during the first week of the second semester of the fifth year. Upon the successful completion of their comprehensive exam, they will obtain approval of their thesis abstract from their thesis committee ("pre-thesis review") by the end of the second week of the second semester of their fifth year.

In all other details, the graduate portion of the BA/MA program is identical to the two-year MA program, as stipulated above.

Dual Degree Program

MA/MBA in Art History

To support the university's mission of advancing knowledge across disciplines, and in recognition that business education and training has relevance to many academic fields, the Leeds School of Business and Department of Art and Art History endorse a dual degree program in which both a Master of Business Administration and a Master of Fine Arts (or Master of Arts in art history) is awarded to those students who satisfy the requirements outlined below. This three-year program offers students the opportunity to earn both degrees together in less time than if the degrees were earned sequentially.

Admissions Process and Degree Requirements

Students must apply to and meet the application requirements for each program separately. Admitted students spend their first year in one of the two programs, the second year in the other program and the third year is a combination of the two. MFA students are required to complete 43 credit hours of MBA course work and 45 credit hours of AAH course work. MA (art history) students are required to complete 43 credit hours of MBA course work and 30 credit hours of art history course work. Both degrees must be awarded simultaneously.

Note: Residents of Western states, including Alaska and Hawaii, may be eligible for in-state tuition for this dual degree program. For more information, visit the "Western Regional Graduate Program" section on the Office of the Registrar's Exceptions to One-Year Domicile (<http://www.colorado.edu/registrar/students/state-residency/domicile-exceptions>) webpage.

Requirements

Prerequisites

The following are required for admission to the graduate program:

1. A baccalaureate degree from an approved college with a cumulative grade point average of at least 3.00.
2. A score of 153 or higher on the verbal section and an above-average score (at least 60 percent below) on all other sections of the Graduate Record Examination.
3. A broad general background in history, literature and philosophy.
4. An extensive background in art history.
5. Applicants to the master's program in art history are asked to write a 750- to 1,000-word essay in Part II, number 6 on the application form. Applicants are also required to provide a writing sample of approximately 10–20 pages. Typically, this is a paper submitted for an undergraduate class.

Advisor

Upon admission, students are assigned a faculty advisor. Students should remain in close contact with the advisor as regards course registration and program requirements. At the end of the second semester of full time study, students should select a thesis advisor (or project advisor) from among the art history faculty.

Course Requirements

The candidate for the MA degree in art history is required to demonstrate an adequate reading knowledge of French, German or another appropriate language before receiving the degree by satisfactory course work equal to three progressive semesters at the college level or above, or by passing an approved language examination. Language examinations may be arranged with one of the art history faculty on an individual basis.

Students are encouraged and expected to attend undergraduate lecture courses as needed to prepare themselves for graduate seminars and for the comprehensive exam.

No more than 9 credit hours of independent study credit may be applied toward the MA degree. A limit of 9 credit hours of transfer credits may be applied toward the MA degree.

Degree Plans

Plan I: Thesis Option

A minimum of 30 credit hours must be completed, of which 21 must be completed in residence on the Boulder campus.

Required Courses

ARTH 6929	Seminar: Theories of Art History ¹	3
ARTH 5949	Visiting Scholars Seminar ²	3
ARTH 6959	Master's Thesis (Art History)	4-6

Electives

At least one 3-credit-hour, 5000- or 6000-level course in four of the following areas of art history: medieval, early modern and Renaissance, art of the Americas, Asian art, modern art, contemporary art and critical theory/museology. When available, ancient art may constitute an area.	12
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At least one 3-credit-hour, 3000-level or above course in a department outside the Department of Art and Art History that supplements the major or minor areas of specialization.

Additional courses to meet the 30-credit hour minimum.	5-3
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Total Credit Hours	30
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¹ Must be taken during the first semester, and may be taken twice for up to 6 credit hours.

² Must be taken during the second semester when offered. Students are encouraged to repeat this course.

First-Year Review

During the last two weeks of April, students are evaluated during the first-year review. It focuses on a review of student course work and performance, on selecting the major and minor areas of study in preparation for the comprehensive exam (see below) and on selection of a thesis topic, if applicable.

Comprehensive Exam

This exam is given to measure the graduate student's knowledge of art history at the MA level. It consists of essay questions pertinent to the student's major and minor areas of study. It is given once per year during the second week of October. The comprehensive exam consists of two

essays: a two-hour essay in the major area and a 90-minute essay in the minor area. Students must pass the comprehensive exam in order to be eligible to register for thesis credit hours.

Thesis Abstract ("pre-thesis review")

By the end of the semester preceding the student's thesis semester, the student will prepare an abstract of approximately 1–2 typewritten pages, with attached bibliography, outlining the thesis topic and method of inquiry. The thesis abstract must be approved by the student's pre-thesis review committee in order for the student to register for thesis hours.

Thesis

This should demonstrate scholarly research and writing in art history, should be based on independent study and analysis and should represent the equivalent of 4–6 credit hours. In most cases, the master's thesis is the equivalent of a 40–50 page paper, exclusive of endnotes, bibliography and illustrations.

Thesis Defense

In consultation with the thesis advisor, the student will select a thesis committee that consists of not less than three members of the art history graduate faculty, including the thesis advisor. The student will then schedule the thesis defense and prepare all necessary paperwork. The thesis must be submitted to all members of the thesis committee at least one week before the thesis defense. Graduate School guidelines ("specifications") must be used to prepare the MA thesis. Upon successful defense, the thesis is submitted to the Graduate School in the electronic form specified by the Graduate School, in accordance with the Graduate School's deadlines. A hard copy of the signature page, complete with the thesis committee members' signatures, is submitted to, and remains in, the Graduate School.

Plan II: Project Option

A minimum of 36 credit hours must be completed, of which 21 must be completed in residence on the Boulder campus.

Required Courses

ARTH 6929	Seminar: Theories of Art History ¹	3
ARTH 5949	Visiting Scholars Seminar ²	3
ARTH 6969	Master's Project (Art History)	4-6

Electives

At least one 3-credit-hour, 5000- or 6000-level course in four of the following areas of art history: medieval, early modern and Renaissance, art of the Americas, Asian art, modern art, contemporary art and critical theory/museology. When available, ancient art may constitute an area. 12

At least one 3-credit-hour, 3000-level or above course in a department outside the Department of Art and Art History that supplements the major or minor areas of specialization. 3

Additional courses to meet the 36-credit hour minimum. 11-9

Total Credit Hours 36

¹ Must be taken during the first semester, and may be taken twice for up to 6 credit hours.

² Must be taken during the second semester when offered. Students are encouraged to repeat this course.

Time Limit

It is expected that the MA program be completed within two years.

Art Practices - Master of Fine Arts (MFA)

The art practices areas include ceramics, painting and drawing, IMAP (Interdisciplinary Media Arts Practice: photography, video, digital arts and integrated arts), film (in collaboration with the Film Studies Program), printmaking and sculpture.

Concurrent Degree Program

BA/MFA in Film Studies and Art Practices (Film Track)

The film studies/art practices bachelor of arts/master of fine arts critical studies degree gives highly motivated BA students the opportunity to earn an MFA degree using an accelerated undergraduate program in combination with a fifth year of study.

Program Description

The BA/MFA degree in film studies (FS) is a critical studies track under the auspices of the art practices MFA program. This collaboration between the Film Studies Program and the Department of Art and Art History is an extension of our common interests in visual art. The Film Studies tenured and tenure-track faculty also have graduate faculty standing within Art and Art History.

The BA/MFA track prepares students for professional careers in teaching and criticism, from the perspective of innovative critical approaches and in preparation for a PhD track at another university. The aim of the BA/MFA film program is to aid in the advancement of the scholarly understanding of film art, with emphasis on theoretical and research approaches and their role in academia. The BA/MFA will, therefore, prepare its graduates to assume the responsibilities of the academic study of cinema as one of the fine arts and to pursue careers in teaching, research, curating and the overall advancement of the study of cinema as art.

The program offers studies leading to the MFA in the areas of film criticism and theory. Advanced students are encouraged to explore interdisciplinary approaches as well as to enhance their program of study with cognate courses in other departments such as history, comparative literature, anthropology, English, women's studies, ethnic studies, Spanish and Portuguese, French and Italian, Germanic and Slavic languages and literatures and others. Film studies offers a broad selection of seminar topics on their current faculty research interests and in response to student demand. The Visiting Film Artist program brings additional distinguished, innovative film and video artists and critics to campus and students are encouraged to register for their seminars.

Admission to the Program

- Admission to the program occurs during the second semester of the junior year. Applicant should have a cumulative GPA of 3.3 and have completed all MAPS deficiencies. All applicants will provide a copy of their (internal) CU transcript. (Please note: Applicant should specify on the on the form that they are applying for the spring term, BA/MFA degree, major codes AS-FLM2 and GR-ART). After completing the top portion of the form, the student should make an appointment with the Director, Professor Ernesto Acevedo-Muñoz (www.colorado.edu/filmstudies/ernesto-acevedo-munoz (<http://www.colorado.edu/filmstudies/ernesto-acevedo-munoz>)).
- The sole application deadline is the second Monday in October. Please submit the standard BA/MA application form (http://www.colorado.edu/GraduateSchool/academics/_docs/Concurrentapplication.pdf) with your package. Note: Applicants

should specify on the form that they are applying for the spring term, BA/MFA degree, major codes AS-FLM2 and GR-ART2.

- Students will secure the sponsorship and/or advisory commitment of a Film Studies faculty member at the rank of assistant professor or higher. The applicant will include a brief letter or statement from the Faculty member attesting to the advisory relationship.
- Applicants will submit a one-page prospectus detailing a possible research topic for an MFA thesis. The prospectus must include a minimum bibliography of 10–15 items.
- "October Surprise": Applicants must successfully complete a writing assignment in the form of a 10–12 page analytical/theoretical or historical argument paper on a film determined by the faculty. Students will pick up a DVD and a "prompt" or question in the Film Studies office at 4 p.m. on the Friday before the application is due. Over the weekend, the applicants must watch the movie, do some research, make an argument, and write the paper, which will be handed in with the application Monday at 9 a.m. The "October Surprise" portion of the application process is designed to have students demonstrate their writing skills and their ability to find, define, and argue a topic in a fairly sophisticated manner for an aspiring master's student.
- Only currently enrolled, University of Colorado Boulder students, may be considered for admission to the program. Transfer students must complete at least 24 credit hours as a degree-seeking student before applying to the program.
- Student enrolled in the BA/MFA track cannot pursue a double major or double degree of any kind.

Requirements

Prerequisites

The following are required for admission to the graduate program:

- Bachelor's degree from an approved college or school of art with a minimum grade point average of 2.750.
- Minimum of 34 credit hours of acceptable work in art; 12 credit hours in fine arts history is preferred.
- Submission of a portfolio, including 20 images, representing creative work, a written statement of goals and objectives and an artist statement.
- Applicants interested in IMAP-Video or film track should submit their portfolios on DVDs, for screening by the IMAP and film committees.

Advisor

Upon admission, students are assigned a tenured or tenure-track faculty member to serve as an academic advisor in the student's area of purpose.

Course Requirements

A minimum of 54 credit hours (of which 36 credit hours must be taken in residence on the Boulder campus) of acceptable graduate work must be completed beyond the bachelor's degree.

Procedures for transferring credit from other graduate programs are governed by the regulations of the Graduate School. Transfer credit, not to exceed 18 credit hours for studio arts or nine credit hours for art history, must first be approved by the student's academic advisor, associate chair and the Graduate School.

Students who wish to change their area of concentration after admission must petition the art practices curriculum committee.

Required Courses and Semester Credit Hours

Home studio (major area)—min. 12	12
Electives (student and non-studio; up to 6 credit hours may be taken in an allied field, at the 3000 level and above)	21
Art history, theory or film critical studies	9
Visiting Artist Seminar	3
Graduate Art Seminar	3
Thesis	6
Total Credit Hours	54

Film Track

ARTF 5030 is allowed as a substitute for ARTS 5118.

Program Requirements

First-Semester and First-Year Reviews

In consultation with the advisor, the student will establish the membership of his or her committee, consisting of a minimum of three faculty members and one second-year graduate student, and schedule the first semester review; its purpose is to give feedback to the student with regard to progress toward the degree. At the end of the first year, the committee is convened for a first year review; its purpose is to evaluate the student's progress in the program and to determine if she or he will continue in the program.

Pre-Thesis Review

At the end of the semester preceding the graduating semester, the pre-thesis review takes place. Its purpose is for the graduate student to present the focus of his or her written thesis and exhibition, to review and evaluate the student's progress in the program, and to determine if the student is ready to register for thesis hours.

Thesis/Exhibition/Defense

The MFA thesis defense must be conducted while the student's work is on view during the MFA Exhibition. The MFA thesis must be submitted in its final draft form to all the thesis committee members two weeks prior to the scheduled thesis defense. After the defense, two copies of the thesis, with the required signatures on the signature sheet, must be turned into the Graduate Program Coordinator. One of these is catalogued in the Norlin Library.

Time Limit

It is expected that the MFA program be completed within two-and-a-half years.

Graduation

Before registering for ARTS 6957, students must have a pre-thesis review with their faculty advisor and thesis committee. Studio arts thesis work must take the form of original creative work of acceptable professional standards. The oral defense exam must be done in conjunction with the thesis exhibition, and the candidate must provide a critical written statement (creative thesis) concerning the work. The candidate's written creative thesis is housed with the Art and Architecture Collection in Norlin Library, and 10-15 digital images (representing work in the exhibition) become part of and are housed with the departmental Visual Resources Center. The committee may request a contribution of original work.

Asian Languages and Civilizations

The Department of Asian Languages and Civilizations offers BA/MA, MA, Dual MA and PhD graduate degrees with specializations in Chinese (<https://www.colorado.edu/alc/graduate/chinese>) or Japanese (<https://www.colorado.edu/alc/graduate/japanese>). Celebrating a history of over 30 years, the department offers small class sizes that allow ALC graduate students the opportunity to work closely with faculty who are noted scholars in their fields.

For more information about the Department of Asian Languages and Civilizations, please visit the department website (<https://www.colorado.edu/alc>).

Course codes for these programs are **CHIN** and **JPNS**.

Master's Degree

- Asian Languages and Civilizations - Master of Arts (MA) (p. 910)

Doctoral Degree

- Asian Languages and Civilizations - Doctor of Philosophy (PhD) (p. 911)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adil, Sabahat Fatima (https://experts.colorado.edu/display/fisid_155862)
Assistant Professor; PhD, University of Chicago

Alexander, Katherine Laura Bos (https://experts.colorado.edu/display/fisid_157674)
Assistant Professor; PhD, University of Chicago

Arima, Yoshie (https://experts.colorado.edu/display/fisid_147528)
Instructor; MA, University of Colorado Boulder

Attwa, Mona Farrag (https://experts.colorado.edu/display/fisid_155976)
Instructor; MA, American Univ In Cairo (Egypt)

Brown, Janice Carole (https://experts.colorado.edu/display/fisid_143612)
Professor; PhD, Univ of British Columbia (Canada)

Chaturvedi, Vidhu (<http://www.colorado.edu/alc/vidhu-chaturvedi>)
Instructor

Chen, Jin (https://experts.colorado.edu/display/fisid_143539)
Instructor; MA, University of Colorado Boulder

Chung, Jae Won (<http://www.colorado.edu/alc/jae-won-chung>)
Assistant Professor

Farokhfal, Reza (https://experts.colorado.edu/display/fisid_146455)
Instructor; MA, Concordia University (Canada)

Hsu, Chun-ling (https://experts.colorado.edu/display/fisid_126783)
Instructor; MEd, University of Wisconsin-River Falls

Kim, Sangbok (https://experts.colorado.edu/display/fisid_149220)
Instructor; PhD, University of California-Los Angeles

Kimbrough, Randle Keller (https://experts.colorado.edu/display/fisid_141167)
Associate Professor; PhD, Yale University

Kleeman, Faye Yuan (https://experts.colorado.edu/display/fisid_113313)
Professor; PhD, University of California-Berkeley

Kleeman, Terry F (https://experts.colorado.edu/display/fisid_114181)
Professor; PhD, University of California-Berkeley

Kroll, Paul W (https://experts.colorado.edu/display/fisid_102408)
Professor; PhD, University of Michigan Ann Arbor

Matsunaga, Yumiko (https://experts.colorado.edu/display/fisid_149899)
Senior Instructor; MA, University of Wisconsin-Madison

Muhammed, Randa (https://experts.colorado.edu/display/fisid_152815)
Instructor; BA, South Valley University (Egypt)

Parson, Rahul Bjorn (https://experts.colorado.edu/display/fisid_156069)
Assistant Professor; PhD, University of California, Berkeley

Qian, Zhiying (https://experts.colorado.edu/display/fisid_157736)
Senior Instructor; PhD, University of California, Berkeley

Richter, Antje (https://experts.colorado.edu/display/fisid_145310)
Associate Professor; Dr habil, Univ of Kiel (Germany)

Richter, Matthias Ludwig (https://experts.colorado.edu/display/fisid_144864)
Associate Professor; PhD, Univ of Hamburg (Germany)

Stuckey, Andrew (<http://www.colorado.edu/alc/andrew-stuckey>)
Assistant Professor; PhD, UCLA

Courses

CHIN 5010 (3) Sinological Methods

Provides training in research methods for graduate work in Sinology. Regular exercises require students to use standard bibliographic sources and tools, such as leishu, congshu, specialized dictionaries, dynastic histories, geographical treatises, gazetteers, and private historiography. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5030 (3) Readings in Pre-Modern Chinese Literary Theory

Introduces the field of pre-modern Chinese literary theory and its relevance in Chinese intellectual history. Based on the close reading of primary sources, i.e. typically on selected core texts of Chinese literary thought, as well as on the reading of secondary literature. Texts and topics vary from year to year.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5120 (3) History of Literature through the Ninth Century

Surveys, with readings in primary and secondary sources, major landmarks in various areas of ancient and medieval literature. Focuses on the classic and most influential works of the Zhou through Tang dynasties. Gives attention to matters of historical fact and actuality as well as to textual and interpretive history.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5130 (3) History of Chinese Literature from the Tenth to the Nineteenth Century

Survey of Chinese literature from the tenth to the nineteenth century, with readings in primary and secondary sources. Focuses on the major literary works, genres, figures, and movements of the Song through the Qing dynasties.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5210 (3) Ancient Prose

Studies selected pre-imperial and Han prose texts important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on works such as the Lun yu, Mengzi, Zhuangzi, Huainanzi, Shiji, Hanshu, and Lunheng. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5220 (3) Ancient Poetry

Studies selected pre-imperial and Han poetic works important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on the Shijing and the Chu ci, as well as the fu and shi of Han writers. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5230 (3) History of Early Chinese Thought

Introduces early Chinese philosophy, mostly "Masters' Literature" of the 5th–1st c. BCE, which is foundational for all later Chinese philosophy and political thought. Close reading of primary sources will be combined with an introduction to secondary scholarship in English and modern Chinese, both articles on individual texts/philosophers and comprehensive histories of early Chinese philosophy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5280 (3) Topics in Ancient Literature

Examines a specific problem or issue in ancient Chinese literature, e.g., early views of language's relationship to reality, or the commentary tradition and the emergence of allegorical and metaphysical approaches to interpreting texts. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5410 (3) Medieval Prose

Studies works of early medieval (ca. 200-600 AD) and/or late medieval (600-900) prose that played important role in development of Chinese literature. Writers and topics vary, ranging from surveys of specific genre, literary essays, proto-fiction, or historical writings, to focused studies of major figures Liu Zhiji, Han Yu, or Liu Zongyuan. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5420 (3) Medieval Poetry

Studies works of early medieval (ca. 200-600 AD) poetry. Writers and topics vary ranging from surveys of specific genre, shi or fu, or shared subject such as religious or commemorative verse, or specific periods, to focused studies of particular major figures Cao Zhi, Tao Qian, Li Bo, or Du Fu. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5430 (3) Medieval Thought and Religion

Studies selected works of early medieval (ca. 200-600 AD) and/or late medieval (600-900) religious importance. Selections vary from fundamental texts of both literary and religious value, Daoist and Buddhist canons, the Huangting jing, Zhen gao, Miaofa lianhua jing, and Tan jing, particular topics of social or cultural importance, character assessment, arcane learning, or methods of commentary. Knowledge of Classical Chinese at the level of CHIN 4220 is required..

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5480 (3) Topics in Medieval Literature

Examines a specific problem or issue in medieval literature, e.g., the role of encyclopedias and anthologies in literary training, or the place and forms of literary composition at the imperial court. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5610 (3) Early Modern Prose

Studies Song, Ming, and Qing prose texts selected for their inherent literary merit and for their significance in the Chinese literary tradition. Typically focuses on works by major authors such as Ouyang Xiu, Su Shi, and Yuan Hongdao. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5620 (3) Early Modern Poetry

Studies Song, Yuan, Ming and Qing poetry. Stresses major figures, stylistic variations, various poetry schools, new directions in shi verse, and the rise and development of ci. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5630 (3) Early Modern Fiction

Explores selected vernacular and classical fiction of the Ming and Qing periods. Normally focuses on long novels such as *Xiyou ji*, *Sanguo yanyi*, *Shuihu zhuan*, *Jin Ping Mei*, as well as short stories by Feng Menglong and Ling Mengchu. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5680 (3) Topics in Early Modern Literature

Examines a specific problem or issue in early modern literature (e.g., the relationships among religion, folklore, and early fiction; the issue of genre and traditional fiction); the role of elite versus popular cultures in the composition of fiction; or the relationship of the state and censorship and the southern philosophical schools to the publication of fiction. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5750 (3) Daoism

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 4750 and RLST 4750 and RLST 5750

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5810 (3) Modern Literature

Examines selected texts in various genres of Chinese literature from the May Fourth period (beginning 1917) to the establishment of the People's Republic of China (1949). Focuses on major and influential works produced in this fertile period of experimentation with Western, modernist types of literature. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5820 (3) Contemporary Literature

Examines selected texts in various genres of Chinese literature from 1949 (the establishment of the People's Republic of China) to the present. Focuses on major works from the very different literary worlds of Taiwan and mainland China. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5830 (3) History of Chinese Film

Examines the development of narrative film in China from the early twentieth century to today, covering the major periods, styles, and themes developed in Chinese cinema. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5880 (3) Topics in 20th Century Literature

Examines a specific problem or issue in 20th century literature, e.g., feminist fiction in China, modernism in fiction and poetry, or the role of literary criticism in modern literature. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5890 (3) Topics in Chinese Film

Examines a specific problem or issue in Chinese film, e.g. 5th generation filmmakers, early film, genre (martial arts, melodrama, Hong Kong action, etc.), Taiwan New Cinema, Hollywood crossover. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5900 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5980 (1) Practical Issues in Chinese Language Pedagogy

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses. Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 4980

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 6900 (1-6) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

JPNS 5010 (3) Bibliography and Research Methods

Introduces research materials on Japan in Japanese and Western languages, including bibliographic tools, style sheets, and library resources. Overview of secondary sources and publication outlets/methods of disseminating research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5020 (3) Methods of Teaching Japanese

Surveys pedagogical theory and methods for the teaching of Japanese as a second language, including issues of presentation, interaction, and evaluation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5050 (3) Japanese Sociolinguistics: Japanese Language and Society

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4050 and LING 4050

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5070 (3) Second Language Acquisition of Japanese

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4070

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5080 (3) Kanji in Japanese Orthography

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4080

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5150 (3) Japanese Literary Translation

Explores theories and practice of translation of literary texts as applied to Japanese-English translation; strategies for handling a variety of texts; and professional standards and ethics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5210 (3) Classical Prose Literature

Examines selected prose works and authors from the Classical, or Heian, period (784-1185). Texts may include selections from diaries, tale literature, and *zuihitsu* such as Izumi Shikibu *Nikki*, Genji Monogatari, and Makura no Soshi. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5220 (3) Waka, Renga, and Haiku

Studies the three most important poetic forms in Japanese literary history. Emphasizes the reading and analysis of selected texts and authors that best represent these genres. Readings include selections from the first eight imperial poetry anthologies (*hachidaishu*), famous renga sequences (Minase Sangin *Hyakuin*, for example), and the haiku of Basho. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5280 (3) Topics in Classical Japanese Literature

Studies a specific problem or issue in classical (eighth through twelfth century) Japanese literature, e.g., the development of specifically Japanese theories of literature or the concept of genre in the Japanese tradition. Topics vary from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5310 (3) Advanced Classical Japanese 1

Focuses on stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras. Department enforced: knowledge of Classical Japanese at the level of JPNS 4310 is required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5320 (3) Advanced Classical Japanese 2

Advanced analysis of stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras, including kanbun and hentaigana; translation and explication of texts.

Requisites: Requires prerequisite course of JPNS 5310 (minimum grade C). Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5410 (3) Medieval Prose Literature

Focuses on selected prose works and authors from the medieval, or Kamakura and Muromachi periods (1185-1600). Texts may include selections from a variety of war tales, histories, courtly fiction, diaries, memoirs, short prose narratives (otogi-zoshi), Noh plays, and Buddhist literature such as Heike Monogatari, Towazugatari, Izayoi Nikki, Tsurezuregusa, and Shasekishu. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5420 (3) Japanese Buddhism and Literature

Studies selected works from the Japanese literary tradition in which Buddhism plays a significant thematic role. Focuses on texts such as the Nihon Ryoiki, Buddhist poetry (Shakkyo-Ka) from the imperial poetry anthologies, Heike Monogatari, Hojoki, the poetry of Saigyō and Bashō, and selected Noh plays. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5480 (3) Topics in Medieval Literature

Focuses on a specific problem or issue in medieval literature, e.g., the spread of literary composition beyond the court. Topics vary from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5610 (3) Japanese Dramatic Literature

Examines major writers and texts of the no, kyogen, kabuki, and bunraku theaters, including the plays and critical writings of such authors as Kannami Kiyotsugu, Zeami Motokiyo, Konparu Zenchiku, and Chikamatsu Monzaemon. Texts and secondary readings vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5620 (3) Early Modern Japanese Literature and Culture

Examines the literature, arts, drama and culture of Japan's early modern period in the original language, as well as secondary scholarship and methodologies for pursuing work on early modern materials. Genres covered include kana-zoshi, uklyo-zoshi, dangibon, yomihon, sharebon, kibiyoshi, ninjobon, kokkelbon, gokan, halkai, senryo, kyoka, joruri, kabuki, and literary thought.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5810 (3) Modern Japanese Literature

Studies selected texts in Japanese literature from the Meiji Restoration (1868) to the end of the Pacific War. Surveys various literary genres, emphasizing the development of the modern novel as an aspect of Japan's response to Western cultural forms. The unique cultural politics of each of the periods (Meiji, Taisho, and Showa) are illuminated through the filter of both canonical and more marginalized texts. Specific selections vary from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5820 (3) Contemporary Japanese Literature

Covers developments in Japanese prose fiction and/or other literary genres from the end of the Pacific War in 1945 to the present.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5830 (3) Readings in Modern and Contemporary Japanese Thought and Culture

Examines central issues in Japanese culture and society since the Meiji Restoration (1868) through selected readings of the works of major writers in the fields of literature, anthropology, feminism, political science, and religion, among others. Provides a broad context for cultural studies in modern and contemporary Japan by positioning the most important commentators within their historical and social situations.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5920 (1-3) Topics in Modern Literature and Culture

Close study of a specific problem or issue in modern or contemporary literature or culture: e.g., transwar literary nationalism. Formerly JPNS 5880.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5980 (1) Practical Issues in Japanese Language Pedagogy

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language class. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning. Department enforced prerequisite: knowledge of Modern Japanese at the level of JPNS 4120.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4980

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 6900 (1-6) Japanese Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 6940 (1) Japanese Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 6950 (1-6) Japanese Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

Asian Languages and Civilizations - Master of Arts (MA)

The MA program in Chinese is designed to offer students maximum general exposure to the long sweep of Chinese literary and cultural history, as well as the opportunity to delve into the study of a particular period, field, topic or genre. With six professors covering literature and culture from early China through the medieval era to the early modern period and contemporary China, the program is truly comprehensive in scope. The program focuses especially on preparing students for PhD study and careers in sinology. Since 1991, more than 50 graduates of the Chinese MA program have gone on to doctoral study here or at other first-rank institutions in the U.S.

The MA program in Japanese is designed to provide advanced-level training in Japanese language, literature and civilization, with the aim of preparing students for both Japan-related professional careers and doctoral study in Japanese literature and culture. The program boasts four professors with specializations in the literature and performing arts of classical, medieval, early-modern and modern Japan. In recent years, our MA students have gone on to PhD programs in Japanese literature,

art history and religious studies at this and numerous other first-rank institutions in the U.S. and abroad.

For more information, visit the department's Prospective Students (<http://www.colorado.edu/alc/graduate>), Chinese (<http://www.colorado.edu/alc/graduate/chinese>) and Japanese (<http://www.colorado.edu/alc/graduate/japanese>) webpages.

Concurrent Degree Program BA/MA in Chinese or Japanese and Asian Languages and Civilizations

The concurrent BA/MA (Bachelor of Arts/Master of Arts) degree program in Chinese or Japanese recognizes the need for master's-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the Chinese or Japanese language, knowledge of the culture of China or Japan and its literature, and the skills acquired by BA and MA graduates in the humanities: research, analysis, interpretation, translation and communication.

This degree offers a challenging and focused academic experience for exceptional students (particularly those who enter the university with significant preparation in Chinese or Japanese studies from high school or with other backgrounds, or those who participate in study abroad opportunities at CU) who demonstrate the ability to express their ideas clearly, both orally and in written form, using standard English. Highly motivated students who are accepted into the program begin graduate work no later than the senior year and earn both the BA and MA in five years. Students must have a minimum 3.25 GPA for all courses taken at CU Boulder and should have completed all MAPS and core requirements by the end of the sophomore year.

The application is open only to CU Boulder students. Students must submit the written application for admission (<http://www.colorado.edu/graduateschool/academic-forms>), along with a statement of purpose, a writing sample and three letters of recommendation, at least one from a full-time member of the Chinese or Japanese faculty, by Sept. 1 of their junior year (or, in exceptional circumstances, during the student's senior year) to the director of graduate studies in Chinese or Japanese (<https://www.colorado.edu/alc/graduate/advising>). Applications will be reviewed by the graduate faculty of Chinese or Japanese. Students interested in applying for this option must consult with the department's undergraduate academic advisor (<https://www.colorado.edu/alc/undergraduate/advising>) early in their career at CU to establish their program of study.

Please refer to the Chinese BA/MA (<https://www.colorado.edu/alc/graduate/chinese>) and Japanese BA/MA (<https://www.colorado.edu/alc/graduate/japanese>) pages on the department website for specific information about requirements and curriculum.

Dual Degree Program Dual MA in Asian Languages and Civilizations and History or Religious Studies

The Department of Asian Languages and Civilizations participates in a dual master's program with the Departments of History (<http://www.colorado.edu/history/graduate-students/ma-programs/dual-ma-programs>) and Religious Studies (<http://www.colorado.edu/rilst/graduate/dual-ma>). Students admitted to the MA programs in these departments may apply to complete a second MA in one of the other programs. Such degrees serve the needs of students who seek a truly interdisciplinary experience among intellectually affiliated

departments. Students interested in exploring this option should contact the director of graduate studies in Chinese or Japanese (<https://www.colorado.edu/alc/graduate/advising>) for specific requirements.

Requirements

The MA in Asian languages and civilizations offers specializations in Chinese or Japanese.

All entering students in the Chinese program must take CHIN 5010 at the earliest opportunity. Students employed as teaching assistants also must take CHIN 5980 or JPNS 5980. Selection of courses beyond these is made in consultation with the director of graduate studies in Chinese or Japanese (<https://www.colorado.edu/alc/graduate/advising>).

Prospective graduates will be required to present either 24 hours of approved course work plus a master's thesis (Plan I), or 30 hours of approved course work without a thesis (Plan II). The 24 hours must be completed at the 5000 level or above. Up to six credits from other departments may be completed at the 3000 or 4000 level at the discretion of the department.

Specific requirements for the MA in Chinese (<https://www.colorado.edu/alc/graduate/chinese>) and MA in Japanese (<https://www.colorado.edu/alc/graduate/japanese>), as well as a full list and description of graduate courses (<https://www.colorado.edu/alc/courses>) offered, are available on the department website.

Asian Languages and Civilizations - Doctor of Philosophy (PhD)

The PhD programs in Chinese and Japanese offer extensive training in the modern and premodern literatures of China and Japan for students seeking to pursue research and teaching careers at the collegiate level.

For more information, visit the department's Prospective Students (<https://www.colorado.edu/alc/graduate>), Chinese (<https://www.colorado.edu/alc/graduate/chinese>) and Japanese (<https://www.colorado.edu/alc/graduate/japanese>) webpages.

Requirements

The PhD in Asian languages and civilizations offers specializations in Chinese or Japanese with concentrations in literary and/or cultural studies of either the premodern or modern periods.

The PhD requires a minimum of 45 credit hours in graduate courses numbered 5000 or above in Chinese or Japanese, and 30 credit hours of dissertation work beyond the required course work. Selection of courses should be made in consultation with the director of graduate studies in Chinese or Japanese (see the department's Graduate Advising (<https://www.colorado.edu/alc/graduate/advising>) webpage). Academic preparation is expected in both classical and modern language.

Some graduate or advanced undergraduate course work from related fields may also be included, in accordance with Graduate School rules. Additionally, some course work completed for the MA degree at CU or other similarly rigorous institutions may count toward the 45 credit hours required. PhD students may transfer to the department up to 21 hours of acceptable graduate-level credit.

Visit the department's PhD in Chinese (<http://www.colorado.edu/alc/graduate/chinese>) and PhD in Japanese (<http://www.colorado.edu/alc/graduate/japanese>) webpages for specific requirements, as well as a full

list and description of graduate courses (<https://www.colorado.edu/alc/courses>) offered.

Asian Studies

The Center for Asian Studies was established in 1999 to advance knowledge of Asia through undergraduate and graduate education, faculty research and outreach programs for the broader community. The Center for Asian Studies is pleased to offer the Graduate Certificate in Asian Studies. In addition, a number of department and schools allow the pursuit of the study of Asia including the Leeds School of Business, Global Business Certificate with a Global Experience in Asia.

The center is committed to managing and expanding the interdisciplinary major in Asian Studies by providing student fellowships, scholarships, and study opportunities; by investing in faculty research and professional development; by providing support for building Asia-related resources on the CU Boulder campus; by developing academic exchanges with Asia-based colleagues and students; and by engaging the local community with Asia-related programs and events.

The center also serves to promote the university's Flagship 2030 Initiative to "Build a Global Crossroads" by internationalizing education on campus and promoting Asia in the context of global studies.

Finally, the center serves as a link and community-building resource for faculty and students across the university.

Course code for this program is ASIA.

Certificate

- Asian Studies - Graduate Certificate (p. 911)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Berry, J. Colleen (https://experts.colorado.edu/display/fisid_155491)
Instructor; PhD, Indiana University Bloomington

Jones, Carla Mae (https://experts.colorado.edu/display/fisid_134172)
PhD, University of North Carolina Chapel Hill

Oakes, Timothy S. (https://experts.colorado.edu/display/fisid_109269)
PhD, University of Washington

Asian Studies - Graduate Certificate

The Center for Asian Studies is pleased to offer the Graduate Certificate in Asian Studies. The certificate is available to all graduate students and post-BA students in the professional schools currently enrolled at CU Boulder, and to non-degree-seeking ACCESS students with a bachelor's degree. It enables students with intellectual or professional interest in Asia who are not focused primarily on Asia within their own degree program to acquire an official credential indicating that they have expertise in some aspect of Asian knowledge or practice.

For more information, visit the Center for Asian Studies' Asian Studies Graduate Certificate (<http://www.colorado.edu/cas/academics/asian-studies-graduate-certificate>) webpage.

Requirements

How to Apply

- Write to the Certificate Director (colleen.berry@colorado.edu)
- Upon acceptance, meet with the Certificate Director to approve a plan for coursework and meeting the language requirement
- Upon completion, submit transcript to the Center for Asian Studies for review by the Certificate Director and Steering Committee

Course Requirements

Students must complete 12 credit hours of approved graduate courses with a grade of B or higher.

- Specialization allowed in East Asia, South Asia, Central Asia, Southeast Asia, or West Asia/Middle East
- 2 courses in a single discipline or department
- 2 courses from outside of that discipline or department
- Thematic courses that have at least 50% Asia content may also be counted, dependent on approval by the Certificate Director and Committee
- Up to 3 credits may be taken as independent study on an Asia-related topic at the 5000 level or higher with approval from the Certificate Director
- 9 credits must be at or above the 5000 level
- Two years' college-level proficiency in an Asian language relevant to specialization (does not count toward the certificate credit hours)

Note: Independent Study - Students may take 3 credits of independent study on an Asia-related topic at the 5000 level or higher with a CAS Faculty Affiliate from outside of their home department; students may not take both a theory class and an independent study for the certificate.

Approved Undergraduate Courses at 3000 or 4000 level

These courses must be outside the student's home department.

Anthropology

ANTH 4020	Explorations in Anthropology (Islam; Ethnography of Southeast Asia; Global Cultures: Islam; Global Islams)
ANTH 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)
ANTH 4180	Anthropological Perspectives: Contemporary Issues (Nepal and the Himalayas)
ANTH 4690	Anthropology of Tibet
ANTH 4750	Culture and Society in South Asia
ANTH 4760	Ethnography of Southeast Asia and Indonesia

Art & Art History

ARTH 3619	The Arts of China
ARTH 3629	The Arts of Japan
ARTH 3929	Special Topics in Art History (Asian Art: Gods, Kings, and Power; Art in Asian Religions)
ARTH 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
ARTH 4269	Art and Archaeology of the Ancient Near East
ARTH 4919	Capstone Seminar: Topics in Art History (Contemporary Asian Art; China!; Contemporary Art in the Middle East; Contemporary Art of the Himalayas)

ARTH 4929 Special Topics in Art History (Art of Buddhism; Politics/Propaganda Asian Art; Art of the Himalayas/Tibet)

Asian Languages & Civilizations

ARAB 3230	Islamic Culture and the Iberian Peninsula
ARAB 3231	In the Footsteps of Travelers: Travel Writing in Arabic Lit
ARAB 3241	Art in Islamic Cultures
ARAB 3330	The Arabic Novel
ARAB 3340	Representing Islam
ARAB 3350	Narrating the City: Literary Mappings of the Urban Landscape
ARAB 3410	Gender, Sexuality and Culture in the Modern Middle East
ARAB 4250	Arabic Media
CHIN 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization
CHIN 3311	The Dao and the World in Medieval China
CHIN 3321	Culture and Literature of Ancient China
CHIN 3331	Culture and Literature of Late Imperial China
CHIN 3334	Chinese Narrative Tradition
CHIN 3341	Literature and Popular Culture in Modern China
CHIN 3342	Literary Culture in Contemporary China
CHIN 3351	Reality and Dream in Traditional Chinese Literature
CHIN 3361	Women and the Supernatural in Chinese Literature
CHIN 3371	Topics in Chinese Film
CHIN 4210	Introduction to Classical Chinese
CHIN 4220	Readings in Classical Chinese
CHIN 4300	Open Topics: Readings in Chinese Literature
CHIN 4750	Daoism
HIND 3400	Special Topics
HIND 3441	Screening India: A History of Bollywood Cinema
HIND 3651	Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination
HIND 3661	South Asian Diasporas: Imagining Home Abroad
HIND 3811	The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature
HIND 3831	The Many Faces of Krishna in South Asia Literature and Culture
HIND 3851	Devotional Literature in South Asia
JPNS 3200	Adv Wrtg Topics on Chinese & Japanese Literature and Civilization
JPNS 3331	Business Japanese
JPNS 3511	From Rebellion to Calamity: Contemp Japanese Lit in Transl
JPNS 3811	Love, Death, and Desire: Classical Japanese Literature in Translation
JPNS 3821	Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation
JPNS 3831	The Floating World of Play and Passion: Early Modern Japanese Literature in Translation
JPNS 3841	Tradition and Transgression: Modern Japanese Literature in Translation
JPNS 3851	Studies in Japanese Popular Culture

JPNS 3861	Imagining the Samurai in Japanese Literature and Culture	HIST 4166	The Vietnam War in Politics and Culture
JPNS 3871	Horror and the Macabre in Japanese Literature, Film, Culture	HIST 4328	The Modern Middle East, 1600 to the Present
JPNS 3881	Environment, Nature and Disaster in Japanese Literature and Culture	HIST 4329	Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001
JPNS 3891	Travel/Travel Writing in Japanese Literature and Culture	HIST 4338	History of Modern Israel/Palestine
JPNS 4050	Japanese Sociolinguistics: Japanese Language and Society	HIST 4339	Borderlands of the British Empire
JPNS 4150	Japanese to English Translation: Theory and Practice	HIST 4348	Topics in Jewish History (Jews Under Islam or Tel Aviv: Urban History and Culture)
JPNS 4210	Contemporary Japanese 1: Current Issues	HIST 4349	Decolonization of the British Empire
JPNS 4300	Open Topics: Readings in Japanese	HIST 4378	History of Modern Jewish-Muslim Relations
JPNS 4310	Classical Japanese 1	HIST 4528	Islam in South and Southeast Asia (1000 to the Present)
JPNS 4320	Classical Japanese 2	HIST 4538	History of Modern India
JPNS 4400	Critical Theory and Japanese Literature and Culture	HIST 4548	Women in Modern India
KREN 3841	Modern Korean Literature in English Translation	HIST 4558	Buddha to Gandhi: A History of Indian Nonviolence
Asian Studies		HIST 4618	Early Modern China, 960-1842
ASIA 3300	Sex and Gender in Asian Film and Literature	HIST 4619	Women in East Asian History
ASIA 4300	Open Topics in Asian Literature and Culture	HIST 4628	Modern China: Collapse of Imperial Brilliance, 1644-1949
ASIA 4840	Independent Study	HIST 4638	Contemporary China: Radicalism and Reform, 1949 to Present
Classics		HIST 4648	Inventing Chinese Modernity, 1800 to Present
CLAS 4169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)	HIST 4658	China and Islam from the 7th Century to the 20th Century
CLAS 4269	Art and Archaeology of the Ancient Near East	HIST 4688	Window on Modern China
College of Engineering		HIST 4718	Ancient, Classical, and Medieval Japanese History
HUEN 3750	Xi'an, China: Self-Awareness and Images of the Other	HIST 4728	Modern Japanese History
HUEN 3843	Special Topics (China through the Eyes of the West)	HIST 4738	History of Early Modern Japan (1590-1868)
Economics		HIST 4758	The History of Postwar Japan, 1945 to Present
ECON 4534	Chinese Economic History in Comparative Perspective	Humanities	
Education		HUMN 3093	Topics in Humanities (Representing Islam; The Arabic Novel; Narrating the City)
EDUC 4800	Special Topics (Asia)	HUMN 3321	Culture and Literature of Ancient China
Film Studies		HUMN 3341	Literature and Popular Culture in Modern China
FILM 4023	Topics in International Cinema (Contemporary Asian Cinema)	HUMN 3811	Love, Death, and Desire: Classical Japanese Literature in Translation
Geography		HUMN 3841	Tradition and Transgression: Modern Japanese Literature in Translation
GEOG 3822	Geography of China	HUMN 4100	Writing the World in Traditional China
GEOG 3832	Geographies of South Asia	International Affairs	
GEOG 4762	Geographies of Political Islam: Empire, Terror and Revolution	IAFS 3000	Special Topics in International Affairs (Political Economy/Middle East; Turkey–Mediator/Arab Spring; Gender, Geopolitics and Islam)
GEOG 4822	Environment and Development in China	IAFS 3520	Global Seminar: Justice, Human Rights and Democracy in Israel
GEOG 4832	Geography of Tibet	IAFS 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
History		IAFS 3650	History of Arab-Israeli Conflict
HIST 3109	Seminar in Asian History	IAFS 4500	The Post-Cold War World (China in Global Economy; Arab Awakening; Afghanistan and Iraq; Contemporary China/International Views; Cultural Revolution/China 1966-79; South Asia/Conflict Resolution)
HIST 3628	Seminar in Recent Chinese History	International Business	
HIST 3718	Seminar in Japanese History	INBU 3300	International Business and Management
HIST 4020	Topics in Comparative History (British Empire India 1760-1947; Modernity in China and Japan)		
HIST 4109	World War II in Asia and the Pacific		

INBU 3301	Doing Business in China
INBU 4151	International Operations in Hong Kong
INBU 4200	International Financial Management
Jewish Studies	
JWST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
JWST 3650	History of Arab-Israeli Conflict
JWST 4050	Anthropology of Jews and Judaism (Cultures of Israel and Palestine)
JWST 4302	Global Seminar: Justice, Human Rights and Democracy in Israel
JWST 4338	History of Modern Israel/Palestine
JWST 4378	History of Modern Jewish-Muslim Relations
Media Studies	
MDST 4211	Asian Media and Culture
MDST 4341	International Media and Global Crises
Music	
EMUS 3467	World Music Ensemble (Japanese Ensemble; Gamelan Ensemble)
MUSC 4152	East Asian Music
Philosophy	
PHIL 3800	Open Topics in Philosophy (Buddhism as Philosophy)
Political Science	
PSCI 3072	Government and Politics in Southeast Asia
PSCI 3102	South Asian Politics
PSCI 4022	Chinese Foreign Policy
PSCI 4028	Special Topics (Islam and Development; Politics of Southeast Asia)
PSCI 4052	Chinese Politics
PSCI 4242	Middle Eastern Politics
Religious Studies	
RLST 3200	Hinduism
RLST 3300	Foundations of Buddhism
RLST 3530	Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul
RLST 3750	Women in Buddhism
RLST 3800	Chinese Religions
RLST 3820	Topics in Religious Studies (Tibetan Buddhism; Religion in Modern China; Buddhist Art and Ritual; Islam, Politics and Militancy; Story of the Quran; Art in Asian Religions)
RLST 4200	Topics in Hinduism
RLST 4250	Topics in Buddhism
RLST 4260	Topics in Judaism (when it has an Asia focus)
RLST 4650	Islam in the Modern World
Women & Gender Studies	
WGST 3220	Women in Islam
WGST 3410	Gender, Sexuality and Culture in the Modern Middle East
WGST 3500	Global Gender Issues
WGST 3750	Women in Buddhism
WGST 4619	Women in East Asian History

Graduate Courses with a Theory Focus

If a student takes one of these courses, they may not also take an Independent Study course for the certificate; the course must be taught by a CAS Faculty Affiliate and the student must complete written assignments/projects on an Asia-related topic.

Anthropology

ANTH 5020	Explorations in Anthropology
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Art and Film Studies

ARTF 5023	Topics in International Cinema (Contemporary Asian Cinema)
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Art & Art History

ARTH 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
ARTH 5269	Art and Archaeology of the Ancient Near East
ARTH 5929	Special Topics in Art History (when it has an Asia focus)
ARTH 6929	Seminar: Theories of Art History (when it has an Asia focus)
ARTH 6939	Graduate Seminar: Open Topics in Art History (East and West)

Classics

CLAS 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
CLAS 5269	Art and Archaeology of the Ancient Near East

Economics

ECON 8413	Seminar: International Trade Theory
ECON 8764	History of Economic Development

History

HIST 5053	Britain and the Empire, 1688-1964
HIST 5339	Borderlands of the British Empire
HIST 5349	Decolonization of the British Empire

Media Studies

MDRP 6201	Global Media and Culture
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Religious Studies

RLST 5820	Interdisciplinary Seminar on Religion (The Body in Chinese Religion)
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Law

LAWS 6518	Introduction to Islamic Law
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Graduate Courses with an Asia Focus

Anthropology

ANTH 5020	Explorations in Anthropology (Islam; Ethnography of Southeast Asia; Global Cultures: Islam; Global Islams)
ANTH 5750	Culture and Society in South Asia
ANTH 5760	Ethnography of Southeast Asia and Indonesia

Art & Art History

ARTH 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
ARTH 5269	Art and Archaeology of the Ancient Near East

Classics

CLAS 5169	Topics in Ancient and Classical Art and Archaeology (Persian Empire)
CLAS 5269	Art and Archaeology of the Ancient Near East

Geography

GEOG 5832	Geography of Tibet
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History

HIST 5129	Colloquium in Modern Asian History
HIST 5328	The Modern Middle East, 1600 to the Present
HIST 5538	History of Modern India
HIST 5548	Women in Modern India
HIST 5619	Women in East Asian History
HIST 5628	Modern China: Collapse of Imperial Brilliance, 1644-1949
HIST 5638	Contemporary China: Radicalism and Reform, 1949 to Present
HIST 5658	China and Islam from the 7th Century to the 20th Century
HIST 5728	Modern Japanese History
HIST 5738	History of Early Modern Japan (1590-1868)
HIST 6019	Readings in World History (The Japanese Empire)
HIST 6109	Readings in Asian History
HIST 6349	Decolonization in Transnational Perspective: The End of the British Empire in S Asia & Middle East
HIST 6528	Reading in South Asian History
HIST 7119	Graduate Research Seminar in Asian History

Music

EMUS 5467	World Music Ensemble (Japanese Ensemble; Gamelan Ensemble)
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School of Law

LAWS 6518	Introduction to Islamic Law
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Political Science

PSCI 7012	Seminar: Comparative Political Systems (when it has an Asia focus)
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Religious Studies

RLST 5200	Topics in Hinduism
RLST 5210	Advanced Readings in Sanskrit
RLST 5250	Topics in Buddhism
RLST 5260	Topics in Judaism (when it has an Asia focus)
RLST 5650	Islam in the Modern World

Theatre & Dance

THTR 5061	On Stage Studies: Asian Performance
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Graduate Literature Courses

For students with sufficient training in Chinese or Japanese

Chinese

CHIN 5010	Sinological Methods
CHIN 5030	Readings in Pre-Modern Chinese Literary Theory
CHIN 5120	History of Literature through the Ninth Century
CHIN 5130	History of Chinese Literature from the Tenth to the Nineteenth Century
CHIN 5210	Ancient Prose
CHIN 5220	Ancient Poetry
CHIN 5230	History of Early Chinese Thought
CHIN 5280	Topics in Ancient Literature
CHIN 5410	Medieval Prose
CHIN 5420	Medieval Poetry

CHIN 5430	Medieval Thought and Religion
CHIN 5480	Topics in Medieval Literature
CHIN 5610	Early Modern Prose
CHIN 5620	Early Modern Poetry
CHIN 5630	Early Modern Fiction
CHIN 5680	Topics in Early Modern Literature
CHIN 5750	Daoism
CHIN 5810	Modern Literature
CHIN 5820	Contemporary Literature
CHIN 5830	History of Chinese Film
CHIN 5880	Topics in 20th Century Literature
CHIN 5890	Topics in Chinese Film

Japanese

JPNS 5010	Bibliography and Research Methods
JPNS 5050	Japanese Sociolinguistics: Japanese Language and Society
JPNS 5150	Japanese Literary Translation
JPNS 5210	Classical Prose Literature
JPNS 5220	Waka, Renga, and Haiku
JPNS 5280	Topics in Classical Japanese Literature
JPNS 5310	Advanced Classical Japanese 1
JPNS 5320	Advanced Classical Japanese 2
JPNS 5410	Medieval Prose Literature
JPNS 5420	Japanese Buddhism and Literature
JPNS 5480	Topics in Medieval Literature
JPNS 5610	Japanese Dramatic Literature
JPNS 5620	Early Modern Japanese Literature and Culture
JPNS 5810	Modern Japanese Literature
JPNS 5820	Contemporary Japanese Literature
JPNS 5830	Readings in Modern and Contemporary Japanese Thought and Culture
JPNS 5920	Topics in Modern Literature and Culture

Astrophysical and Planetary Sciences

The curriculum and research in the department emphasizes three major areas: astrophysics, planetary sciences, and solar and space physics.

Those wishing to pursue graduate work in APS leading to candidacy for an advanced degree should carefully read the Master's Degree Requirements (p. 866) and the Doctoral Degree Requirements (p. 867).

Course code for this program is ASTR.

Doctoral Degree

- Astrophysical and Planetary Sciences - Doctor of Philosophy (PhD) (p. 919)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Armitage, Philip J (https://experts.colorado.edu/display/fisid_124718)
Professor; PhD, University of Cambridge (England)

Ayres, Thomas R (https://experts.colorado.edu/display/fisid_100090)
Research Professor; PhD, University of Colorado Boulder

Baker, Daniel N (https://experts.colorado.edu/display/fisid_103264)
Distinguished Professor; PhD, University of Iowa

Bally, John (https://experts.colorado.edu/display/fisid_105710)
Professor; PhD, University of Massachusetts at Amherst

Barth, Charles A.
Professor Emeritus

Begelman, Mitchell C (https://experts.colorado.edu/display/fisid_100446)
Professor; PhD, University of Cambridge (England)

Brain, David A (https://experts.colorado.edu/display/fisid_149098)
Assistant Professor; PhD, University of Colorado Boulder

Brown, Benjamin P (https://experts.colorado.edu/display/fisid_153758)
Assistant Professor; PhD, University of Colorado Boulder

Burns, Jack O (https://experts.colorado.edu/display/fisid_124317)
Professor; PhD, Indiana University Bloomington

Cash, Webster C (https://experts.colorado.edu/display/fisid_101759)
Professor; PhD, University of California-Berkeley

Comerford, Julia M (https://experts.colorado.edu/display/fisid_151471)
Assistant Professor; PhD, University of California-Berkeley

Conti, Peter S.
Professor Emeritus

Cranmer, Steven (https://experts.colorado.edu/display/fisid_155051)
Associate Professor; PhD, University of Delaware

Danforth, Charles W. (https://experts.colorado.edu/display/fisid_130779)
Instructor

Darling, Jeremiah K (https://experts.colorado.edu/display/fisid_141767)
Associate Professor; PhD, Cornell University

Dulk, George A.
Professor Emeritus

Duncan, Douglas K (https://experts.colorado.edu/display/fisid_126824)
Senior Instructor

Ellingson, Erica (https://experts.colorado.edu/display/fisid_100118)
Associate Professor; PhD, University of Arizona

Ergun, Robert E (https://experts.colorado.edu/display/fisid_115912)
PhD, University of California-Berkeley

Esposito, Larry Wayne (https://experts.colorado.edu/display/fisid_100502)
Professor; PhD, University of Massachusetts at Amherst

France, Kevin Christopher (https://experts.colorado.edu/display/fisid_145201)
Assistant Professor; PhD, Johns Hopkins University

Glenn, Jason (https://experts.colorado.edu/display/fisid_115556)
Professor; PhD, University of Arizona

Green, James C (https://experts.colorado.edu/display/fisid_102344)
Professor; PhD, University of California-Berkeley

Halverson, Nils W (https://experts.colorado.edu/display/fisid_134252)
Associate Professor; PhD, California Institute of Technology

Hamilton, Andrew J S (https://experts.colorado.edu/display/fisid_101517)
Professor; PhD, University of Virginia

Hindman, Bradley W (https://experts.colorado.edu/display/fisid_103726)
Asst Research ProfessorLecturer; PhD, University of Colorado Boulder

Hornstein, Seth D (https://experts.colorado.edu/display/fisid_144237)
Senior Instructor; PhD, University of California-Los Angeles

Linsky, Jeffrey
Professor Emeritus

Malville, J. McKim
Professor Emeritus

McCray, Richard A.
Professor Emeritus

Rast, Mark Peter (https://experts.colorado.edu/display/fisid_142997)
Associate Professor; PhD, University of Colorado Boulder

Schneider, Nicholas M (https://experts.colorado.edu/display/fisid_102620)
Associate Professor; PhD, University of Arizona

Shull, J Michael (https://experts.colorado.edu/display/fisid_103350)
Professor; PhD, Princeton University

Snow, Theodore P. Jr
Professor Emeritus

Speiser, Theodore W.
Professor Emeritus

Stocke, John T (https://experts.colorado.edu/display/fisid_103369)
Professor; PhD, University of Arizona

Thomas, Gary E.
Professor Emeritus

Toomre, Juri (https://experts.colorado.edu/display/fisid_100767)
Professor; PhD, University of Cambridge (England)

Courses

ASTR 5110 (3) Atomic and Molecular Processes

Explores the application of quantum physics and statistical mechanics to problems in astrophysics, space physics and planetary science, with an emphasis on radiative processes and spectroscopy of atoms and molecules.

Requisites: Restricted to graduate students only.

ASTR 5120 (3) Radiative and Dynamical Processes

An introduction to radiative and dynamical processes aimed at graduate students in astrophysics, space physics and planetary science. Covers transport phenomena, the macroscopic treatment of radiation fields, magnetohydrodynamics and dynamical processes associated with planetary orbits and N-body systems.

Requisites: Restricted to graduate students only.

ASTR 5140 (3) Astrophysical and Space Plasmas

Teaches magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5141

Requisites: Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

ASTR 5150 (3) Introductory Plasma Physics

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzmann equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory).

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5150

Requisites: Restricted to graduate students only.

ASTR 5300 (3) Introduction to Magnetospheres

Introduces solar and stellar winds, and planetary and stellar magnetospheres. Acquaints students with the guiding center theory for particle motion, magnetospheric topology, convection, radiation belts, magnetic storms and substorms, and auroras.

Requisites: Restricted to graduate students only.

ASTR 5330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 4330 and GEOL 4330 and GEOL 5330

Requisites: Restricted to graduate students only.

ASTR 5400 (3) Introduction to Fluid Dynamics

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5400

Requisites: Restricted to graduate students only.

ASTR 5410 (3) Fluid Instabilities, Waves, and Turbulence

Involves linear and nonlinear analyses of small-scale waves and instabilities in stratified fluids, with effects of rotation. Studies internal gravity and acoustic waves with terrestrial, planetary and astrophysical applications. Studies thermal and double-diffusive convection, homogeneous and stratified shear flow instabilities. Examines these topics from the onset of small amplitude disturbances to their nonlinear development and equilibration. Department enforced prerequisite: ASTR 5400 or ATOC 5060.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5410

Requisites: Restricted to graduate students only.

ASTR 5540 (3) Mathematical Methods

Presents an applied mathematics course designed to provide the necessary analytical and numerical background for courses in astrophysics, plasma physics, fluid dynamics, electromagnetism, and radiation transfer. Topics include integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations. Draws illustrative examples from the areas of physics listed above.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5540

Requisites: Restricted to graduate students only.

ASTR 5550 (3) Observations, Data Analysis and Statistics

Introduces multi-wavelength observational techniques, their limitations and effects of various noise sources. Describes basic data handling, error analysis, and statistical tests relevant to modeling. Topics include probability distributions, model-fitting algorithms, confidence intervals, correlations, sampling and convolution. Students derive physical measurements and uncertainties with hands-on analysis of real datasets. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

Requisites: Restricted to graduate students only.

ASTR 5560 (3) Radiative Processes in Planetary Atmospheres

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite or corequisite: ASTR 5110.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5560

Requisites: Restricted to graduate students only.

ASTR 5700 (3) Stellar Astrophysics

Explores stellar interiors, evolution and atmospheres, with the Sun and its heliosphere being used as the closest and best-studied example of a star. Covers energy generation, transport, principles of stellar structure, stellar rotation, pulsation and evolution to supernova and compact object stages. Includes radiation transport in stellar photospheres, chromospheres, coronas, winds. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ASTR 5120.

ASTR 5710 (3) High-Energy Astrophysics

Studies astrophysics of UV, x-ray, gamma-ray and cosmic-ray sources, including fundamentals of radiative and particle processes, neutron stars, black holes, pulsars, quasars, supernovas and their remnants; stellar flares; accretion disks; binary x-ray sources; and other cosmic x-ray sources. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5720 (3) Galaxies

Highlights the classification, structure, content, dynamics, and other observational properties of galaxies, active galaxies, and clusters of galaxies. Discusses Hubble's Law, the cosmic distance scale, and the intergalactic medium. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5730 (3) Stellar Atmospheres and Radiative Transfer

Explores stellar atmospheres: basic stellar atmospheres, spectral line formation, interpretation of stellar spectra and model atmospheres.

Examines solar physics: the Sun as a star, solar cycle, chromospheric and coronal structure, energy balance, magnetic field and solar wind. Department enforced prerequisites: ASTR 5110 and undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5740 (3) Interstellar Astrophysics

Highlights structure, dynamics and ecology of the interstellar medium, stressing the physical mechanisms that govern the thermal, ionization and dynamic state of the gas and dust; observations at all wavelengths; star formation; relation to external galaxies. Department enforced prerequisite: ASTR 5110.

Requisites: Restricted to graduate students only.

ASTR 5760 (3) Astrophysical Instrumentation

Covers the fundamentals underlying the design, construction and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include Fourier transforms and their applications, optical design concepts, incoherent and coherent signal detection, electronics and applications, and signal acquisition and processing. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5770 (3) Cosmology

Studies the smooth universe, including Friedmann-Robertson-Walker metric, Friedmann equations, cosmological parameters, inflation, primordial nucleosynthesis, recombination, and cosmic microwave background. Also studies the lumpy universe, including linear growth of fluctuations, power spectra of CMB and galaxies, dark matter, and large scale flows. Covers galaxy formation and intergalactic medium. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

Requisites: Restricted to graduate students only.

ASTR 5780 (3) Mission Design and Development for Space Sciences

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5440

Grading Basis: Letter Grade

ASTR 5800 (3) Planetary Surfaces and Interiors

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5800

Requisites: Restricted to graduate students only.

ASTR 5810 (3) Planetary Atmospheres

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5810 and GEOL 5810

Requisites: Restricted to graduate students only.

ASTR 5820 (3) Origin and Evolution of Planetary Systems

Considers the origin and evolution of planetary systems, including proto-planetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5820 and GEOL 5820

Requisites: Restricted to graduate students only.

ASTR 5830 (3) Topics in Planetary Science

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5830 and GEOL 5830

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 5835 (1) Seminar in Planetary Science

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester. Department enforced prerequisite: senior level undergraduate physics.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5835 and GEOL 5835

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 5920 (1-6) Reading and Research in Astrophysical and Planetary Sciences

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 6000 (1) Seminar in Astrophysics

Studies current research and research literature on an astrophysical topic. Students and faculty give presentations. Subjects vary each semester. May be repeated for a total of 4 credit hours to meet candidacy requirements.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 6050 (3) Space Instrumentation

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 6050 and GEOL 6050

Grading Basis: Letter Grade

ASTR 6610 (3) Earth and Planetary Physics 1

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6610 and PHYS 6610

Requisites: Restricted to graduate students only.

ASTR 6620 (3) Earth and Planetary Physics 2

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6620 and PHYS 6620

Requisites: Restricted to graduate students only.

ASTR 6630 (3) Earth and Planetary Physics 3

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6630 and PHYS 6630

Requisites: Restricted to graduate students only.

ASTR 6650 (1-3) Seminar in Geophysics

Advanced seminar studies in geophysical subjects for graduate students.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6650 and PHYS 6650

Requisites: Restricted to graduate students only.

ASTR 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

ASTR 6950 (1-6) Master's Thesis**ASTR 7160 (3) Intermediate Plasma Physics**

Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 7160

Recommended: Prerequisite PHYS 5150.

ASTR 7500 (1-3) Special Topics in Astrophysical and Planetary Sciences

Acquaints students with current research in astrophysical and planetary sciences. Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ASTR 7920 (1-6) Reading and Research in Astrophysical and Planetary Sciences

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ASTR 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Astrophysical and Planetary Sciences - Doctor of Philosophy (PhD)

Students pursuing a PhD from the Department of Astrophysical and Planetary Sciences generally specialize in the areas of astrophysics or planetary science.

The department does not offer a terminal, stand-alone master's degree program. Students enrolled in the doctoral program may earn their master's degree as they progress toward their PhD.

The program successfully integrates astrophysics, planetary science, solar physics and space instrumentation with strong observational and theoretical components. These assets facilitate interaction and collaboration between the disciplines and enable students to explore a wide variety of research areas.

The Sommers–Bausch Observatory, conveniently located on campus, provides excellent hands–on experience with telescopes and observing, while the world–class Fiske Planetarium, supported by our department, offers a unique opportunity for public outreach. These campus resources are complemented by other affiliated research organizations in Boulder.

For more information, visit the department's Prospective Students (<http://www.colorado.edu/aps/prospective-students>) webpage.

Requirements

A minimum of 37 credit hours of work (including 4 credit hours of graduate seminars) in courses numbered 5000 or above is required; however, the overall emphasis is on independent study and research. A minimum of 30 credit hours of PhD dissertation credit hours are required.

Students in the PhD program are required to remove any deficiencies identified at the preliminary interview, to pass a two-part comprehensive examination composed of a written test on graduate course material and an oral exam on a research paper based on a semi-independent research project, and satisfactorily defend the PhD thesis before a faculty committee.

During the first year of graduate study, students generally obtain a broad background in courses regarded as basic to all three areas in addition to more specialized studies. Many students take graduate-level courses in other departments (e.g., Departments of Physics, Atmospheric and Oceanic Sciences, Geological Sciences, Applied Mathematics or Aerospace Engineering), depending upon their particular interests or participation in interdisciplinary programs (see below).

Required Courses and Semester Credit Hours

ASTR 5110	Atomic and Molecular Processes	3
ASTR 5120	Radiative and Dynamical Processes	3
ASTR 5400	Introduction to Fluid Dynamics	3
ASTR 5540	Mathematical Methods	3

ASTR 5550	Observations, Data Analysis and Statistics	3
Total Credit Hours		15

Electives: Astrophysics Focus

The department offers a broad range of courses and research in this area, leading to the PhD degree. Graduate-level courses are offered in the following subjects:

ASTR 5140	Astrophysical and Space Plasmas	3
ASTR 5700	Stellar Astrophysics	3
ASTR 5710	High-Energy Astrophysics	3
ASTR 5720	Galaxies	3
ASTR 5730	Stellar Atmospheres and Radiative Transfer	3
ASTR 5760	Astrophysical Instrumentation	3
ASTR 5770	Cosmology	3
ASTR 6000	Seminar in Astrophysics	1

Electives: Planetary Sciences Focus

As planetary sciences is an interdisciplinary field, students can obtain degrees from the Departments of Astrophysical and Planetary Sciences, Atmospheric and Oceanic Sciences, Geological Sciences, Physics or Aerospace Engineering. Boulder is also home to a division of the Southwest Research Institute, with over 25 planetary scientists, many of whom work with CU students. Research and courses related to the physics and dynamics of the atmospheres of other planets, planetary surfaces and interiors, and other solar system studies are available.

Graduate-level courses related to the physics and dynamics of the Earth's atmosphere are offered in the following subjects:

ASTR 5140	Astrophysical and Space Plasmas	3
ASTR 5300	Introduction to Magnetospheres	3
ASTR 5330	Cosmochemistry	3
ASTR 5410	Fluid Instabilities, Waves, and Turbulence	3
ASTR 5800	Planetary Surfaces and Interiors	3
ASTR 5810	Planetary Atmospheres	3
ASTR 5820	Origin and Evolution of Planetary Systems	3
ASTR 5830	Topics in Planetary Science	3
ASTR 5835	Seminar in Planetary Science	1
ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5560	Radiative Processes in Planetary Atmospheres	3

Research Opportunities

Observational and Theoretical Astrophysics

Research in this field is conducted in the following areas:

- Stellar atmospheres, radiative transfer, stellar winds of hot/cool stars
- formation of stars and planetary systems
- solar physics
- interstellar and intergalactic medium
- cosmology and large-scale structure of the universe; galaxy formation
- stellar interiors, black holes and neutron stars
- gravitational physics
- cosmic X-ray sources, supernovae and their remnants and accretion phenomena, jets and clusters of galaxies
- galactic evolution, quasars and active galaxies

- radio and sub-millimeter astronomy, microwave background
- plasma astrophysics and MHD
- astrophysical fluid dynamics
- UV, optical, IR, submillimeter, radio and X-ray instrumentation
- instrument and detector development
- sounding rocket and balloon astronomy

Research is carried out with the ARC 3.5m Apache Point telescope, the Sloan Digital Sky Survey-IV and these national telescopes and laboratories and international collaborators: High Altitude Observatory (HAO) in Boulder (solar physics); National Optical Astronomical Observatories in Tucson and Chile (optical astronomy); National Radio Astronomy Observatory (NRAO); the Very Large Array (VLA); the Green Bank Telescope (GBT); the Hubble Space Telescope (HST); the Chandra, SWIFT and XMM X-ray telescopes; the Fermi Gamma-Ray Space Telescope; and the National Solar Observatory (NSO). CU Boulder also is involved with the Messenger (Mercury), MAVEN (Mars), JUNO (Jupiter), Cassini (Saturn) and New Horizons (Pluto) missions, as well as the HST Cosmic Origins Spectrograph.

Locally, APS operates a 24-inch Cassegrain-Coude and 16- and 18-inch Cassegrain telescopes through Sommers-Bausch Observatory. These are available for photographic, photometric and spectrographic observations, as well as for instrument and detector development. Opportunities for graduate research also are found with the university's Laboratory for Atmospheric and Space Physics (LASP), the Center for Astrophysics and Space Astronomy (CASA) and JILA.

Theoretical, Observational and Laboratory Atmospheric and Planetary Science

Research in this field is conducted in the following areas:

- planetary disks, Kuiper Belt objects, extra-solar planets
- dynamics and chemistry of planetary atmospheres, planetary clouds and planetary climates; evolution of planetary atmospheres; comparison of planetary and terrestrial atmospheres
- planetary aeronomy, airglow and aurora, UV and IR spectroscopy, noctilucent clouds, structure and composition of planetary atmospheres (Venus, Mars, Jupiter, Saturn, Uranus, Neptune and Pluto), planetary magneto-spheres and cometary physics
- satellite monitoring of the Earth's atmosphere and environment, including remote sensing of mesospheric ozone, stratospheric trace species, convection, outgoing radiation, and magnetospheric dynamics
- planetary geology, planetary interiors and surfaces, and planetary geophysics.

Graduate research opportunities exist with individual faculty members, as well as jointly with academic and research units, such as the Departments of Geological Sciences, Physics and Aerospace Engineering, as well as the Department of Atmospheric and Oceanic Sciences (ATOC), the National Center for Atmospheric Research (NCAR), the National Oceanic and Atmospheric Administration (NOAA) and the Laboratory for Atmospheric and Space Physics (LASP). The latter is involved in space investigations of the Earth, Sun and planets. Financial support is available in connection with all of the above research activities.

Atmospheric and Oceanic Sciences

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research

environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

Graduate students admitted to ATOC are eligible to receive an advanced degree in atmospheric and oceanic sciences. Graduate students outside of ATOC can pursue the graduate certificate in atmospheric and oceanic sciences while earning a graduate degree from another department at CU Boulder, or while taking course work as a non-degree-seeking student through Continuing Education's ACCESS Program provided they have already earned a bachelor's degree and meet the course prerequisites. In addition, students inside and outside the department may pursue a graduate certificate in oceanography. For more information on graduate certificate programs, see the Graduate School/Interdisciplinary Programs section.

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc>) website.

Course code for this program is ATOC.

Master's Degree

- Atmospheric and Oceanic Sciences - Master of Science (MS) (p. 924)

Doctoral Degree

- Atmospheric and Oceanic Sciences - Doctor of Philosophy (PhD) (p. 925)

Certificates

- Atmospheric and Oceanic Sciences - Graduate Certificate (p. 926)
- Oceanography - Graduate Certificate (p. 926)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Brown, Derek Philip (https://experts.colorado.edu/display/fisid_150027)
Instructor; PhD, University of Colorado Boulder

Cassano, John J. (https://experts.colorado.edu/display/fisid_121781)
Associate Professor; PhD, University of Wyoming

Forrest, Betsy Carroll (https://experts.colorado.edu/display/fisid_101645)
Lecturer; PhD, University of Colorado Boulder

Friedrich, Katja (https://experts.colorado.edu/display/fisid_133607)
Associate Professor; PhD, Ludwig-Maximilians Univ of Munich (Germany)

Han, Weiqing (https://experts.colorado.edu/display/fisid_115493)
Professor; PhD, Nova University

Hart, John E.
Professor Emeritus

Jahn Hall, Alexandra (https://experts.colorado.edu/display/fisid_155096)
Assistant Professor; PhD, McGill Univ (Canada)

Karnauskas, Kristopher Benson (https://experts.colorado.edu/display/fisid_155094)

Assistant Professor; PhD, University of Maryland College Park Campus

Kay, Jennifer E. (https://experts.colorado.edu/display/fisid_153815)
Assistant Professor; PhD, University of Washington

Keen, Richard A.
Professor Emeritus

Lovenduski, Nicole Suzanne (https://experts.colorado.edu/display/fisid_147557)

Assistant Professor; PhD, University of California-Los Angeles

Lundquist, Julie Kay (https://experts.colorado.edu/display/fisid_147838)
Associate Professor; PhD, University of Colorado Boulder

Nigro, Melissa A (https://experts.colorado.edu/display/fisid_152154)
Instructor; PhD, University of Colorado Boulder

Pilewskie, Peter Andrew (https://experts.colorado.edu/display/fisid_134466)

Professor; PhD, University of Arizona

Randall, Cora Einterz (https://experts.colorado.edu/display/fisid_102010)
Professor; PhD, University of California-Santa Cruz

Toohey, Darin W (https://experts.colorado.edu/display/fisid_110652)
Professor; PhD, Harvard University

Toon, Owen Brian (https://experts.colorado.edu/display/fisid_110521)
Professor; PhD, Cornell University

Weiss, Jeffrey B (https://experts.colorado.edu/display/fisid_102145)
Associate Professor; PhD, University of California-Berkeley

Courses

ATOC 5000 (3) Critical Issues in Climate and the Environment

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4800 and ENVS 5830

Requisites: Restricted to graduate students only.

ATOC 5050 (3) Atmospheric Thermodynamics and Dynamics

Covers atmospheric thermodynamics and dynamics and the underlying governing laws and mathematical and physical principles. Topics include atmospheric composition and thermodynamics, conservation laws and atmospheric governing equations, geostrophic balance and balanced flows, vorticity dynamics and boundary layers. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one year of calculus-based physics and math through differential equations.

ATOC 5051 (3) Introduction to Physical Oceanography

Provides fundamental knowledge of observations, theory, dynamics and modeling in physical oceanography. Promotes critical thinking and the development of skills for data analysis and interpretation. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites one year of calculus-based physics and math up through differential equations.

ATOC 5060 (3) Dynamics of the Atmosphere and Oceans

Examines large-scale motions in a stratified rotating atmosphere and ocean, and quasi-geostrophic flow, barotropic and baroclinic instabilities, cyclogenesis, global circulations and boundary layer processes. Ageostrophic motions, including Kelvin waves, internal gravity waves and the theory of frontogenesis are also considered. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ATOC 5050, one year of calculus-based physics and math up through differential equations.

ATOC 5061 (3) Dynamics of Oceans

Explores theories of the large-scale ocean, including quasigeostrophic, planetary geostrophic and shallow water equations. Topics may vary to focus on ocean climate (e.g. thermocline, westward intensification), ocean waves (e.g. gravity, Rossby, and Kelvin) or ocean models (toy, analytic and numerical).

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites ATOC 5400 and ATOC 5051 or ATOC 5060.

ATOC 5151 (3) Atmospheric Chemistry

Reviews basic kinetics and photochemistry of atmospheric species and stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidation capacity of the atmosphere and global climate change. ATOC graduate core course.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5151

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one semester of college-level chemistry.

ATOC 5152 (3) Advanced Atmospheric Chemistry

Follows Graduate Atmospheric Chemistry (ATOC 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5152

Recommended: Prerequisite CHEM 5151 or ATOC 5151.

Grading Basis: Letter Grade

ATOC 5200 (3) Biogeochemical Oceanography

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4200

Requisites: Restricted to graduate students only.

ATOC 5215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4215 and ASEN 4215 and ASEN 5215

Requisites: Restricted to graduate students only.

ATOC 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget. ATOC graduate core course. Department enforced prerequisites: one year of calculus-based physics, and math up through differential equations.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5235

Requisites: Restricted to graduate students only.

ATOC 5300 (3) The Global Carbon Cycle

Covers the role of the ocean, terrestrial biosphere, and atmosphere in the global carbon cycle. Specific topics include marine carbonate chemistry, biological production, terrestrial fluxes, anthropogenic emissions, and the evolution of the global carbon cycle in a changing climate.

Requisites: Restricted to graduate students only.

ATOC 5400 (3) Introduction to Fluid Dynamics

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics. Department enforced prerequisite: partial differential equations or equivalent.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5400

Requisites: Restricted to graduate students only.

ATOC 5410 (3) Fluid Instabilities, Waves, and Turbulence

Nonlinear waves and instabilities; wave-mean and wave-wave interactions, resonant triads; secondary instability and transition to turbulence; diagnosis, modeling, and parameterization of turbulent flows in geophysics and astrophysics. Department enforced prerequisite: ASTR 5120 or ATOC 5060 or ATOC 5400.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5410

Requisites: Restricted to graduate students only.

ATOC 5540 (3) Mathematical Methods

Applied mathematics course; provides necessary analytical background for courses in plasma physics, fluid dynamics, electromagnetism, and radiative transfer. Covers integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5540

Requisites: Restricted to graduate students only.

ATOC 5550 (3) Mountain Meteorology

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4550

ATOC 5560 (3) Radiative Processes in Planetary Atmospheres

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite: ATOC 5235.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5560

Requisites: Restricted to graduate students only.

ATOC 5600 (3) Physics and Chemistry of Clouds and Aerosols

Examines the physics and chemistry of clouds and aerosols in the planetary atmospheres, where they impact climate, atmospheric chemistry, remote sensing and weather. Applies basic microphysical, radiative and chemical processes affecting particles to issues in current literature. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one semester of college-level chemistry and calculus-based physics and math up through differential equations.

ATOC 5730 (3) Physical Oceanography and Climate

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Nino, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4730

Grading Basis: Letter Grade

ATOC 5750 (3) Desert Meteorology and Climate

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4750

Requisites: Restricted to graduate students only.

ATOC 5760 (3) Astrophysical Instrumentation

Covers the fundamentals underlying the design, construction, and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include: Fourier transforms and their applications; optical design concepts; incoherent and coherent signal detection; electronics and applications; signal acquisition and processing.

Requisites: Restricted to graduate students only.

ATOC 5770 (3) Wind Energy Meteorology

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4770

ATOC 5810 (3) Planetary Atmospheres

Covers the structure, composition, and dynamics of planetary atmospheres. Also includes origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres past and future.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5810 and GEOL 5810

Requisites: Restricted to graduate students only.

ATOC 5820 (3) Origin and Evolution of Planetary Systems

Reviews protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets and asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the orbital evolution of solar system bodies.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5820 and GEOL 5820

Requisites: Restricted to graduate students only.

ATOC 5830 (3) Topics in Planetary Science

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5830 and GEOL 5830

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ATOC 5835 (1) Seminar in Planetary Science

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5835 and GEOL 5835

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

ATOC 5900 (1-6) Independent Study

Students may register for more than one section of this course in the same semester.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATOC 6020 (1) Seminar in Atmospheric and Oceanic Sciences

Studies an area of current research in the atmospheric and oceanic sciences. Students read selected papers from the literature. Students and faculty give presentations and participate in discussions. May be repeated for a total of 6 credit hours within the degree. May be repeated for a total of 3 credit hours within a semester.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATOC 6100 (3) Modeling Weather and Climate

Discusses background theory and procedures used for modeling climate on a variety of space and time scales. Includes numerical simulation of weather and climate with models in a hierarchy of complexity, assessments of error growth, prediction of circulations and impact of radiative and other influences. Explores various numerical methods, develops core computing skills and considers data handling and visualization. Consists of a combination of lectures and laboratory.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ATOC 5050 or calculus.

ATOC 6700 (1) Weather Forecasting and Discussion

Explores the techniques used to make short-term weather forecasts in the mid-latitudes using real-time weather observations, numerical forecast model output and conceptual models of mid-latitude weather phenomena. Students will be required to develop and defend conceptual models of the short-term evolution of the weather and will conduct detailed post-forecast analysis of successful and unsuccessful forecasts.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ATOC 5050.

ATOC 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

ATOC 7500 (1-3) Special Topics in Atmospheric and Oceanic Sciences

Acquaints students with current research in atmospheres, oceans, and climate. Topics may vary each semester. Students may register for more than one section of this course in the same semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATOC 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Requisites: Restricted to graduate students only.

Atmospheric and Oceanic Sciences - Master of Science (MS)

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

Students can earn a master's degree with either a thesis or an exam. Students considering master's study in atmospheric and oceanic sciences should carefully read the Master's Degree Requirements (p. 866) section of this catalog, as well as the department's Prospective Graduate Students (<http://www.colorado.edu/atoc/academics/prospective-graduate-students>) and Current Graduate Students (<http://www.colorado.edu/atoc/academics/current-graduate-students>) webpages.

Requirements

Course Requirements

Students must complete at least 30 credit hours of course work, of which 24 must be from courses numbered 5000 or above, and at least 15 must be from ATOC graduate courses, including four of the core ATOC courses.

- Up to 6 credit hours of approved 3000- and 4000-level course work from engineering, math, physics, chemistry or biology may be applied toward the MS degree. No credit will be given toward the MS degree for ATOC course work below the 5000 level.
- A minimum of 15 credit hours from regular ATOC courses (independent study courses cannot be used to satisfy this requirement).
- Four courses within one of the two tracks of ATOC core courses:

Atmosphere Track (A-Track)

ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5151	Atmospheric Chemistry	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3
ATOC 5600	Physics and Chemistry of Clouds and Aerosols	3

Oceanography Track (O-Track)

ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5200	Biogeochemical Oceanography	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3

- Up to 3 credit hours of Independent Study (ATOC 5900), Weather Forecasting and Discussion (ATOC 6700) and/or Seminar in Atmospheric and Oceanic Sciences (ATOC 6020) may be used toward the 30 hours of regular course work in the degree requirements.
- Up to 9 credit hours may be transferred from another accredited institution and applied toward an MS degree. Transfer credit for ATOC core course work must be approved by the graduate advisor.
- A student is required to maintain at least a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the MS, a course mark below C is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

Degree Plans

The master's degree will be a Master of Science in atmospheric and oceanic sciences, regardless of track chosen. The master's thesis is not constrained by choice of track.

Plan I: Thesis Option

Students must complete a minimum of 4 (but no more than 6) thesis hours, which can be counted toward the total 30 hours of course work and the 15 hours of ATOC course work requirements. Students must successfully complete an MS thesis and oral final examination based on the thesis.

Note: Students planning to pursue a PhD degree may elect to obtain the MS degree, but this is not requirement for advancement to the PhD program.

Thesis Guidelines

The MS thesis must consist of original and independent research conducted by the graduate student under the supervision of the research advisor. The thesis topic must be related to the major field, and:

- Represent the equivalent of 4 to 6 credit hours of course work.
- Receive the approval of the major department at least 30 days before commencement at which the degree is to be conferred.
- Be completed at the time the final examination is held.
- Comply with the University of Colorado Graduate School Thesis and Dissertation Specifications.
- Be filed with the Graduate School by posted deadlines for the semester for which the degree is to be conferred.

Thesis Exam Committee

The examination committee for the MS thesis final exam will consist of three graduate faculty members, at least two of whom must be ATOC core faculty members. The examination consists of a 30-minute oral presentation given by the candidate on the thesis subject, followed by a period of questions for the candidate by the committee. The oral presentation is open to anyone who wishes to attend. The full examination typically does not exceed two hours in duration.

Any student with a research advisor outside of ATOC (e.g., an advisor who is from another department or is a full-time employee at NCAR, NOAA, etc.), must also have an academic advisor who is an ATOC core faculty member. The academic advisor should be identified by the student in collaboration with their research advisor as soon as possible, and no later than one month after research begins. Once an ATOC faculty member agrees to act as academic advisor, it is their responsibility to communicate ATOC policies and requirements to the research advisor, and to ensure that the student is meeting all ATOC requirements and making good academic progress toward the degree.

Plan II: Non-Thesis/Final Exam Option

The requirements for an MS degree non-thesis/final exam option include the following:

- 30 semester hours of course work, of which 24 must be from courses numbered 5000 or above, and at least 15 must be from ATOC graduate courses, including four of the core ATOC courses.
- Successful completion of a written final examination based on ATOC regular course work. The ATOC Comprehensive Exam I is typically used to satisfy this requirement.

Note: Students planning to pursue a PhD degree may elect to obtain the MS degree, but this is not a requirement for advancement to the PhD program.

Time Limit

Students are expected to complete all degree requirements within four years of the date of commencing course work, but normally in two years. Students may petition the Graduate School for extension(s).

Atmospheric and Oceanic Sciences - Doctor of Philosophy (PhD)

The Department of Atmospheric and Oceanic Sciences (ATOC) is an interdisciplinary program that provides an educational and research environment to examine the dynamical, physical and chemical processes in the atmosphere, ocean and land surface, and the manner in which they interact. A major theme is the establishment of a physical basis for understanding, observing and modeling climate and global change.

ATOC attracts many of the most outstanding graduate students in the field. Our students receive a significant number of fellowships and nationally recognized awards each year, provide excellent instruction to CU Boulder's undergraduates as teaching assistants, and make scientific advances while conducting innovative research. Our graduates go on to successful careers in academia, national research institutes and private industry.

Graduate students, research staff and faculty work together on a wide range of research themes:

- atmospheric & oceanic dynamics

- atmospheric chemistry & physics
- chemical & physical oceanography
- clouds & aerosols
- planetary atmospheres
- radiative transfer & remote sensing
- regional, boundary layer & wind energy meteorology

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc>) website.

Requirements

Academic Standards

A student is required to maintain a 3.00 (B) average in all work attempted while enrolled in the Graduate School. For the PhD, a course grade of C+ or below is unsatisfactory and will not be counted toward fulfilling requirements for the degree.

Academic Preparation

An undergraduate degree in mathematics, physics, engineering, chemistry or another natural science is recommended. The general prerequisites expected of incoming graduate students include undergraduate courses in calculus, linear algebra, differential equations and computer programming, as well as one-year sequences of undergraduate calculus-based physics and chemistry. Upper-division undergraduate courses in physics, chemistry, engineering and mathematics are strongly recommended. Undergraduate courses in atmospheric and oceanic sciences are useful, but not expected, as part of the undergraduate background.

Course Requirements

A total of 36 credit hours are required, including 18 credit hours in ATOC core courses, as well as a graduate-level course in applied or computational mathematics. In addition, 30 dissertation hours are required. Other specific course requirements are covered in the *ATOC Graduate Handbook*.

All PhD students are required to take a total of six ATOC core courses, or their equivalent, from one of the two following ATOC core course tracks. Regardless of track chosen, the degree will be in atmospheric and oceanic sciences. The doctoral dissertation topic is not constrained by choice of track.

Atmosphere Track (A-Track)

ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5151	Atmospheric Chemistry	3
ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3
ATOC 5600	Physics and Chemistry of Clouds and Aerosols	3
Total Credit Hours		18

Oceanography Track (O-Track)

ATOC 5050	Atmospheric Thermodynamics and Dynamics	3
ATOC 5051	Introduction to Physical Oceanography	3
ATOC 5060	Dynamics of the Atmosphere and Oceans	3
ATOC 5200	Biogeochemical Oceanography	3

ATOC 5235	Introduction to Atmospheric Radiative Transfer and Remote Sensing	3
Select one of the following:		3
ATOC/ASEN 5215	Descriptive Physical Oceanography	
ATOC/ASTR 5400	Introduction to Fluid Dynamics	
GEOL 5270	Marine Chemistry and Geochemistry	
GEOL 5430	Paleoceanography and Paleoclimatology	
MCEN 5021	Introduction to Fluid Dynamics	
Total Credit Hours		18

ATOC offers many graduate elective courses, and students are encouraged to take related electives offered by other departments.

Examinations

Students must pass a two-part comprehensive examination before admission into candidacy. Part I of the comprehensive examination is a written exam based on course material and is normally taken just prior to the second year. Part II of the comprehensive examination is normally taken in the third year and is an oral examination based on an original research paper prepared by the student. After a preliminary copy of the dissertation has been accepted for defense by the student's committee, a final examination on the dissertation and related topics is conducted.

Atmospheric and Oceanic Sciences - Graduate Certificate

Current CU Boulder graduate students and students with a bachelor's degree who are nondegree ACCESS students may pursue the graduate certificate in atmospheric and oceanic sciences.

For more information about ATOC programs and application procedures, call the ATOC office at 303-492-6633 or visit the department's Certificate in Atmospheric and Oceanic Sciences (<http://www.colorado.edu/atoc/academics/graduate-certificate-programs/certificate-atmospheric-and-oceanic-sciences>) webpage.

Requirements

Students who wish to obtain the Graduate Certificate in Atmospheric and Oceanic Sciences (ATOC) must satisfactorily complete four ATOC graduate level courses* or their cross-listed equivalents (e.g., ATOC 5151 or CHEM 5151) provided the cross-listed equivalents are not offered through the student's home department(s). To satisfactorily complete a course, students must earn a grade of B or better.

*ATOC graduate level courses are considered those above the 5000 level. ATOC 5000 Critical Issues in Climate and the Environment cannot be applied towards the Graduate Certificate in Atmospheric and Oceanic Sciences requirements.

Students must meet course prerequisites prior to enrollment. Most of the ATOC Graduate Certificate courses require at least one year of calculus and one year of calculus-based physics.

Upon completion of the ATOC Graduate Certificate requirements, students must complete a Graduate Certificate Request Form and submit it, together with a copy of their unofficial CU-Boulder transcript, to the ATOC graduate program assistant (atocasst@colorado.edu).

Oceanography - Graduate Certificate

Graduate students can pursue the a graduate certificate while earning a normal graduate degree (MS or PhD) at CU Boulder or while taking course work as a nondegree seeking student through Continuing Education's ACCESS Program, provided they have already earned a bachelor's degree and meet the course prerequisites.

Graduate certificates are noted on the official CU Boulder transcript.

Requirements

Students who wish to obtain the graduate certificate in oceanography must complete at least three oceanography core courses (see below) passed with a letter grade of B or better. In addition, students may take an independent study course to replace one of the core courses.

Required Courses and Credit Hours

Complete at least three of the following courses:

ATOC 5051	Introduction to Physical Oceanography
ATOC 5061	Dynamics of Oceans
ATOC 5200	Biogeochemical Oceanography
ATOC/ASEN 5215	Descriptive Physical Oceanography
ATOC 5300	The Global Carbon Cycle
ATOC 7500	Special Topics in Atmospheric and Oceanic Sciences (Physical Oceanography and Climate)
ASEN 5307	Engineering Data Analysis Methods
ASTR/ATOC 5400	Introduction to Fluid Dynamics
ASTR/ATOC 5410	Fluid Instabilities, Waves, and Turbulence
GEOL 5060	Oceanography
GEOL 5270	Marine Chemistry and Geochemistry
GEOL 5430	Paleoceanography and Paleoclimatology

For additional information about the ATOC Certificate or the Oceanography Certificate, contact: atocasst@colorado.edu

Behavioral Genetics

The Institute for Behavioral Genetics (IBG) is an organized research unit of the CU Boulder Graduate School dedicated to conducting and facilitating research on the genetic and environmental bases of individual differences in behavior.

Founded in 1967, IBG is one of the top research facilities in the world for genetic research on behavior. Data collection and analysis are ongoing for several internationally renowned studies including the Colorado Adoption Project, the Colorado Twin Registry, the National Youth Survey Family Study, the Colorado Learning Disabilities Research Center, the National Longitudinal Study of Adolescent Health, and the Adolescent Brain and Cognitive Development Study. IBG is home to one of the nation's largest DNA repositories for research on human behavior, as well as housing a wide array of behaviorally and genetically defined lines of selected, recombinant inbred, transgenic and knockout-gene mice. Current research includes studies of aging, neurodegenerative disease, psychopathology, reading and learning disabilities, cognition, substance abuse, behavioral development and evolution.

Certificate

- Behavioral Genetics - Graduate Certificate (p. 927)

Behavioral Genetics - Graduate Certificate

The Institute for Behavioral Genetics (IBG) offers a training program in behavioral genetics. The goal of the program is to train scientists in the study of genetic contributions to individual differences in behavior. This is accomplished by requiring students to obtain strong training in a primary academic discipline, by providing training in the interdisciplinary field of behavioral genetics, and by providing an atmosphere in which close interactions among scholars with different perspectives may be established.

Requirements

Admission Requirements

To be considered for admission, the Graduate School requires an undergraduate GPA of at least 2.75. Additionally, the most competitive applicants should have verbal and math GREs >85th percentile. Subject GRE scores are not required but will be considered if they have been completed. We carefully consider all components of the application including undergraduate grades, letters of recommendation, previous research experience and GRE scores.

Required Courses

Deviations from the IBG certificate requirements may be requested by petition to the student's advisory committee. Specific requests for course substitution, resolution of an ambiguity, etc., should be made by written petition. A petition may be approved by a majority vote of both the advisory committee and the IBG Training Committee. Disapproval of a petition may be changed to approval by a majority vote of the IBG faculty. Students with sufficient backgrounds may also test out of required courses 1–2 (i.e., pass the final exam for the course).

Required Courses and Semester Credit Hours

Required Courses

PSYC/IPHY 5200	Physiological Genetics and Genomics	3
PSYC 5102	Intro to Behavioral Genetics	3
PSYC 5741	General Statistics ¹	4
or PSYC 5751	General Statistics	
or IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	
or PSYC 5541	Special Topics in Psychology	
PSYC 5112	Concepts in Behavioral Genetics (Required Course: Responsible Conduct in Research)	3

Electives

Complete two courses from the following: 6

PSYC 5122	Quantitative Genetics
IPHY 5102	Introduction to Physiology Genomics
PSYC 5242	Biometrical Methods in Behavioral Genetics
IPHY 5262	Application of Bioinformatics and Genomics
PSYC 7102	Seminar: Behavioral Genetics (Benchmark Papers in Behavioral Genetics)
NRSC 5100	Introduction to Neuroscience I
or NRSC 5110	Introduction to Neuroscience II

or NRSC 5052 Behavioral Neuroscience

or NRSC 5132 Neuropharmacology

Complete one course from the following:

IPHY 5300	Statistical Genetics for Complex Traits
MCDB 5230	Gene Expression (Lecture and Discussion)
MCDB 5471	Mechanisms of Gene Regulation in Eukaryotes
NRSC 5032	Neurobiology of Learning and Memory
NRSC 5072	Clinical Neuroscience: A Clinical and Pathological Perspective
NRSC 5092	Behavioral Neuroendocrinology
NRSC 5132	Neuropharmacology
IPHY 6010	Seminar (Molecular Genetics of Addiction)
NRSC 5545	Neurobiology of Addiction (neuropharmacology, or one of courses 2–4 is required of NIDA trainees)
PSYC 5453	Developmental Psychopathology
PSYC 7102	Seminar: Behavioral Genetics (Genetics of Psychopathology; this course is required for NIMH trainees)
PSYC 7102	Seminar: Behavioral Genetics (Population Genetics in the Modern Genomics Era)

Other approved seminar courses on topics relevant to behavioral genetics

¹ Or other graduate-level course in statistics (of at least one semester) approved by the student's advisory committee.

NOTE: As some courses can only be taught every other year, it is each student's responsibility to take relevant courses when offered. Some equivalent courses may be offered at the Health Sciences Center or other venues. Course substitutions may be requested.

Teaching Requirements

Each of the students in the IBG Training Program must TA for at least one semester in a course judged by their advisory committee to be relevant to their professional specialty. (As part of their general responsibilities for the development of the student, advisory committees may sometimes require additional teaching.)

General Requirements

IBG students are required to conduct their doctoral dissertation research on topics of direct relevance to animal or human behavioral genetics, under the supervision of an IBG faculty member. A training file for each student is maintained in the IBG office for tracking progress toward completion of program requirements. Each student is to assist in updating this file at least once per year.

Specific departmental and Graduate School requirements in addition to those listed here are the responsibility of each student, in consultation with his/her advisory committee.

Examinations

Each student in the training program is examined at least annually by an advisory committee. Examination results are to be incorporated into the student's training file by the Chairperson of each advisory committee.

Annual Presentations at IBG Orientation

All continuing students are required to present a poster describing their research activity of the past year at the annual IBG Orientation—held each year in August (the last Friday before the beginning of the fall semester).

Exit Colloquium

All students are expected to do an exit colloquium at the conclusion of their training program. This presentation should be modeled as a "job talk," not a repeat of the final defense.

Chemistry and Biochemistry

The Department of Chemistry and Biochemistry is internationally recognized for its research and education. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas including analytical, atmospheric, biochemistry, biophysical, chemical physics, environmental, organic, materials and nanoscience, and physical chemistry.

Graduate students enjoy extensive scientific collaboration with chemistry and biochemistry faculty, with other departments such as Molecular, Cellular and Developmental Biology, and Physics, and with research institutes and agencies such as the Cooperative Institute for Research in Environmental Sciences (CIRES), Joint Institutes of Laboratory Astrophysics (JILA) and the National Oceanic and Atmospheric Administration (NOAA).

Course code for this program is CHEM.

Master's Degrees

- Biochemistry - Master of Science (MS) (p. 936)
- Chemistry - Master of Science (MS) (p. 936)

Doctoral Degrees

- Biochemistry - Doctor of Philosophy (PhD) (p. 937)
- Chemistry - Doctor of Philosophy (PhD) (p. 941)
- Chemical Physics - Doctor of Philosophy (PhD) (p. 939)

Certificate

- Molecular Biophysics - Graduate Certificate (p. 943)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahn, Natalie (https://experts.colorado.edu/display/fisid_106044)
Professor; PhD, University of California-Berkeley

Anseth, Kristi S (https://experts.colorado.edu/display/fisid_103471)
Distinguished Professor; PhD, University of Colorado Boulder

Asirvatham, Margaret (https://experts.colorado.edu/display/fisid_103670)
Senior Instructor; PhD, Kansas State University of Agriculture and App Sci

Batey, Robert T. (https://experts.colorado.edu/display/fisid_122668)
Professor; PhD, Massachusetts Institute of Technology

Bierbaum, Veronica (https://experts.colorado.edu/display/fisid_101124)
Professor; PhD, University of Pittsburgh

Birks, John W.
Professor Emeritus

Browne, Eleanor Carol (https://experts.colorado.edu/display/fisid_156464)
Assistant Professor; PhD, University of California-Berkeley

Cameron, Jeffrey Carlyle (https://experts.colorado.edu/display/fisid_156473)
Assistant Professor; PhD, Washington University

Caruthers, Marvin H (https://experts.colorado.edu/display/fisid_103328)
Distinguished Professor; PhD, Northwestern University

Cech, Thomas R (https://experts.colorado.edu/display/fisid_103252)
Distinguished Professor; PhD, University of California-Berkeley

Copley, Shelley (https://experts.colorado.edu/display/fisid_104067)
Professor; PhD, Harvard University

Damrauer, Niels Harley (https://experts.colorado.edu/display/fisid_129797)
Associate Professor; PhD, University of California-Berkeley

Dukovic, Gordana (https://experts.colorado.edu/display/fisid_147414)
Associate Professor; PhD, Columbia University In the City of New York

Eaves, Joel David (https://experts.colorado.edu/display/fisid_147419)
Assistant Professor; PhD, Massachusetts Institute of Technology

Ellison, G. Barney
Professor Emeritus; PhD, Yale University

Falke, Joseph (https://experts.colorado.edu/display/fisid_101970)
Professor; PhD, California Institute of Technology

George, Steven (https://experts.colorado.edu/display/fisid_103289)
Professor; PhD, University of California-Berkeley

Gin, Douglas L. (https://experts.colorado.edu/display/fisid_122861)
Professor; PhD, California Institute of Technology

Goodrich, James Andrew (https://experts.colorado.edu/display/fisid_109239)
Professor; PhD, Carnegie Mellon University

Gough, Raina V (https://experts.colorado.edu/display/fisid_149207)
Instructor

Hendrickson, Susan Marie (https://experts.colorado.edu/display/fisid_145101)
Senior Instructor; PhD, Colorado State University

Hynes, James T (https://experts.colorado.edu/display/fisid_106076)
Distinguished Professor; PhD, Princeton University

Jimenez-Palacios, Jose Luis (https://experts.colorado.edu/display/fisid_125580)
Professor; PhD, Massachusetts Institute of Technology

Jonas, David (https://experts.colorado.edu/display/fisid_107145)
Professor; PhD, Massachusetts Institute of Technology

- Koch, Tad H.
Professor Emeritus; PhD, Iowa State University
- Koval, Carl A (https://experts.colorado.edu/display/fisid_101151)
Professor; PhD, California Institute of Technology
- Kuchta, Robert (https://experts.colorado.edu/display/fisid_100844)
Professor; PhD, Brandeis University
- Kugel, Jennifer Franzen (https://experts.colorado.edu/display/fisid_109472)
Assoc Research Professor; PhD, University of Colorado Boulder
- Lineberger, William Carl (https://experts.colorado.edu/display/fisid_101695)
Distinguished Professor; PhD, Georgia Institute of Technology
- Liu, Xuedong (https://experts.colorado.edu/display/fisid_118458)
Professor; PhD, University of Wisconsin-Madison
- Marshak, Michael Pesek (https://experts.colorado.edu/display/fisid_156422)
Assistant Professor; PhD, Massachusetts Institute of Technology
- McHenry, Charles
Professor Emeritus; PhD, University of California, Santa Barbara
- Michl, Josef (https://experts.colorado.edu/display/fisid_102977)
Professor; PhD, Czech Academy of Sciences, Prague (Czech Republic)
- Miyake, Garret Morgan (https://experts.colorado.edu/display/fisid_154831)
Assistant Professor; PhD, Colorado State University
- Nesbitt, David (https://experts.colorado.edu/display/fisid_100333)
- Nozik, Arthur (https://experts.colorado.edu/display/fisid_113395)
Research Professor; PhD, Yale University
- Palmer, Amy E (https://experts.colorado.edu/display/fisid_141901)
Associate Professor; PhD, Stanford University
- Pardi, Arthur (https://experts.colorado.edu/display/fisid_105996)
Professor; PhD, University of California-Berkeley
- Parker, Roy Robert (https://experts.colorado.edu/display/fisid_151440)
Professor; PhD, University of California-San Francisco
- Parson, Robert (https://experts.colorado.edu/display/fisid_101032)
Professor; PhD, University of Michigan Ann Arbor
- Peters, Kevin
Professor Emeritus
- Pierpont, Cortlandt G.
Professor Emeritus; PhD, Brown University
- Sammakia, Tarek (https://experts.colorado.edu/display/fisid_101597)
Professor; PhD, Yale University
- Schnizer-Luger, Karoline (https://experts.colorado.edu/display/fisid_156579)
Professor; PhD, Univ of Basel (Switzerland)
- Schwartz, Daniel K. (https://experts.colorado.edu/display/fisid_118479)
Professor; PhD, Harvard University
- Sievers, Robert E (https://experts.colorado.edu/display/fisid_102866)
Professor; PhD, University of Illinois at Urbana-Champaign
- Skodje, Rex T (https://experts.colorado.edu/display/fisid_103448)
Professor; PhD, University of Minnesota Twin Cities
- Sousa, Marcelo Carlos (https://experts.colorado.edu/display/fisid_122806)
Professor; PhD, Univ of Buenos Aires (Argentina)
- Spencer, Sabrina Leigh (https://experts.colorado.edu/display/fisid_154911)
Assistant Professor; PhD, Massachusetts Institute of Technology
- Stephen, Ricardo Hugh (https://experts.colorado.edu/display/fisid_145994)
Instructor; PhD, University of Colorado Boulder
- Taatjes, Dylan J (https://experts.colorado.edu/display/fisid_102436)
Associate Professor; PhD, University of Colorado Boulder
- Tan, Zhongping (https://experts.colorado.edu/display/fisid_149809)
Assistant Professor; PhD, Columbia University In the City of New York
- Tolbert, Bert Mills
Professor Emeritus
- Tolbert, Margaret A (https://experts.colorado.edu/display/fisid_104976)
Distinguished Professor; PhD, California Institute of Technology
- Uhlenbeck, Olke C (https://experts.colorado.edu/display/fisid_102471)
Professor Adjunct; PhD, Harvard University
- Vaida, Veronica (https://experts.colorado.edu/display/fisid_100313)
Professor; PhD, Yale University
- Volkamer, Rainer (https://experts.colorado.edu/display/fisid_144988)
Associate Professor; PhD, Univ of Heidelberg (Germany)
- Walba, David M (https://experts.colorado.edu/display/fisid_105830)
Professor; PhD, California Institute of Technology
- Walczak, Maciej Andrzej (https://experts.colorado.edu/display/fisid_153323)
Assistant Professor; PhD, University of Pittsburgh
- Wang, Xiang (https://experts.colorado.edu/display/fisid_145812)
Associate Professor; PhD, Boston University
- Weber, Jorg Mathias (https://experts.colorado.edu/display/fisid_142930)
Associate Professor; PhD, Univ of Kaiserslautern (Germany)
- Wuttke, Deborah S (https://experts.colorado.edu/display/fisid_108412)
Professor; PhD, California Institute of Technology
- Yin, Hang Hubert (https://experts.colorado.edu/display/fisid_144763)
Associate Professor; PhD, Yale University
- Zhang, Wei (https://experts.colorado.edu/display/fisid_146429)
Associate Professor; PhD, University of Illinois at Urbana-Champaign
- Ziemann, Paul Jeffrey (https://experts.colorado.edu/display/fisid_153281)
Professor; PhD, Pennsylvania State University Central Office

Courses

CHEM 5011 (3) Advanced Inorganic Chemistry 1

Lect. Inorganic chemistry based on principles of bonding, structure, reaction mechanisms, and modern synthetic methods. Chemistry and general properties of representative and transition elements and their compounds.

Requisites: Requires prerequisite courses of CHEM 4011 and CHEM 4531 (all minimum grade B-) or graduate standing.

CHEM 5061 (3) Advanced Inorganic Chemistry 2

Lectures in physical inorganic chemistry with an emphasis on topics for understanding modern solar energy conversion to electricity and fuels. Includes a description of bonding and properties of coordination compounds in terms of the ligand field and molecular orbital theories. The primary research literature will be used to motivate exploration of relevant themes including spectroscopy, electron transfer, energy transfer, bioenergetic conversion, and small-molecule activation.

Requisites: Requires prerequisite course of CHEM 4011 (minimum grade C-) or graduate standing.

CHEM 5141 (3) Environmental Water and Soil Chemistry

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4141

Requisites: Restricted to graduate students only.

CHEM 5151 (3) Atmospheric Chemistry

Lect. Basic kinetics and photochemistry of atmospheric species. Stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidative capacity of the atmosphere and global climate change.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5151

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one semester of college-level chemistry.

CHEM 5152 (3) Advanced Atmospheric Chemistry

Follows Graduate Atmospheric Chemistry (CHEM 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5152

Recommended: Prerequisite CHEM 5151 or ATOC 5151.

CHEM 5161 (3) Analytical Atmospheric Spectroscopy

Optical spectrochemical analysis, atmospheric transmittance, including atomic and molecular spectroscopy, line-by-line spectral databases such as HITRAN, absorption, emission, fluorescence, scattering processes of gases, surface enhancements, aerosols, optical spectroscopic instrument components, and techniques, and their applications to atmospheric, and environmental problems. Department enforced prereq., undergraduate physical chemistry or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5171 (3) Electroanalytical Chemistry

Lect. Establishes a background for understanding electrochemical systems through a review of the relevant thermodynamic, kinetic and electronic principles. Compares classical and modern electrochemical methods of analysis. Several special topics are discussed in depth. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5181 (3) Mass Spectrometry and Chromatography

Mass spectrometry, including instrumentation, ionization techniques and interpretation of mass spectra. Theory and practice of analytical separation processes including ion mobility, capillary electrophoresis and liquid gas chromatography. Introduction to applications in e.g. atmospheric and biological mass spectrometry. Introduction to computer simulation of instrumentation and physical processes. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5201 (3) Atmospheric Aerosol Discussions

Discusses recent literature concerning atmospheric aerosols and their role in atmospheric problems, including global ozone depletion, air quality, regional haze, acid rain, and global climate change.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CHEM 5151 or ATOC 5151.

CHEM 5251 (3) Materials Chemistry and Properties

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4251

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

CHEM 5261 (3) Organic Materials: Structures and Functions

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4261

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

CHEM 5271 (3) Chemistry of Solar Energy

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4271

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

CHEM 5281 (3) Semiconductor Processing and Device Fabrication

Understanding of semiconductor processing and device fabrication from chemistry perspective. Overview of processing steps used to fabricate inorganic semiconductor devices including deposition, patterning and etching techniques. Description of process integration during device fabrication. Discussion of key issues facing advanced semiconductor fabrication.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CHEM 5311 (3) Advanced Synthetic Organic Chemistry

Lect. Surveys synthetic transformations emphasizing important functional group transformations and carbon-carbon, bond-forming reactions. Required of all organic chemistry graduate students.

Department enforced prerequisite: one year of organic chemistry or graduate standing.

CHEM 5321 (3) Advanced Physical Organic Chemistry

Lect. Modern concepts of physical organic chemistry and their use in interpreting data in terms of mechanisms of organic reactions and reactivities of organic compounds. Required of all organic chemistry graduate students. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

CHEM 5331 (3) Advanced Spectroscopic Techniques in Organic Chemistry

Lect. Advanced spectroscopic techniques for structure and determination in organic chemistry. Emphasizes proton and carbon-13 NMR spectroscopy. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

CHEM 5341 (3) Chemical Biology and Drug Design

Develop knowledge base and skills in the interdisciplinary field of chemical biology, including aspects of chemistry and biology, and integrating both with respect to hierarchical levels of structure (atomic, molecular, cellular). Students will receive training that helps to develop their careers in biotech, pharmaceutical and other research-oriented industries as well as in academia. Department enforced prerequisites: introductory organic chemistry and general biochemistry.

Requisites: Restricted to graduate students only.

CHEM 5400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Formerly CHEM 5411.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4400 and CHEM 4511

Requisites: Restricted to graduate students only.

CHEM 5491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies.

Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4491

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CHEM 5501 (3) Advanced Topics in Physical Chemistry

Covers various topics in physical chemistry focusing on their mathematical and physical background. Topics include the application of classical mechanics and electrodynamics in chemistry, the classical mechanics background for the description of atoms and molecules, the use of vector spaces in wave mechanics and quantum mechanics and the classical description of spectroscopy in terms of interaction of light and matter. Department enforced prerequisites: undergraduate physical chemistry, graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5531 (3) Statistical Mechanics

Lect. Fundamental concepts of quantum and classical statistical mechanics. Applications to properties of gases, liquids, solids, spin and polymer systems. Reaction, fluctuation, nucleation and relaxation phenomena. Department enforced prerequisite: undergraduate physical chemistry.

Requisites: Restricted to graduate students only.

CHEM 5541 (3) Chemical Dynamics

Lect. Discussion of mechanism and rate of chemical reactions from a fundamental point of view. Discusses nature of collision and develops concepts of cross section and rate constant. Theories of elementary bimolecular and decay processes are critically examined. Department enforced prerequisite: undergraduate physical chemistry.

Requisites: Restricted to graduate students only.

CHEM 5555 (4) Theoretical and Computational Chemistry

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4555

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CHEM 5571 (3) Surface Science

Lect. Principles of surface science with emphasis on fundamental surface phenomena, surface techniques and surface chemistry. Basic description of surfaces, adsorbate-surface interactions, surface kinetics and methods of surface analysis. Surface science of heterogeneous catalysis, semiconductor processing, and environmental interfaces. Department enforced prerequisites: undergraduate physical chemistry and graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5581 (3) Introductory Quantum Chemistry

Lect. Basic principles and techniques of quantum mechanics with applications to questions of chemical interest. Quantum dynamics of atoms, molecules and spin; electronic structure of atoms and molecules. Department enforced prerequisite: two semesters of physical chemistry and graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5591 (3) Advanced Molecular Spectroscopy

Lect. Rotational, vibrational and electronic spectra of molecules, and their interpretation in terms of the quantum theory of molecular structure.

Department enforced prerequisites: two semesters of physical chemistry and graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5621 (3) Genome Databases: Mining and Management

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4621 or MCDB 5621 CHEM 4621

Requisites: Restricted to graduate students only.

CHEM 5700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of organic and physical chemistry will be required. Formerly CHEM 5711.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4700

Requisites: Restricted to graduate students only.

CHEM 5720 (4) Metabolic Pathways and Human Disease

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4720

Requisites: Restricted to graduate students only.

CHEM 5740 (4) Biochemistry of Gene Transmission, Expression and Regulation

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4740

Requisites: Restricted to graduate students only.

CHEM 5751 (3) Current Topics in Biochemical Research

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4751

Requisites: Restricted to graduate students only.

CHEM 5770 (3) Fundamentals of Biochemistry I

Analysis of topics in biochemistry including DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, and protein structure and dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5771 covering the same topics except for the requirement of a written research proposal.

CHEM 5771 (5) Advanced General Biochemistry 1

Lect. In-depth analysis of DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, protein structure, protein dynamics, and physical chemistry of macromolecules. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students.

CHEM 5776 (1) Scientific Ethics and Responsible Conduct in Research

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5776

Requisites: Requires prerequisite course of CHEM 5771 or CHEM 5271 (minimum grade B-). Restricted to graduate students only.

CHEM 5780 (3) Fundamentals of Biochemistry II

Analysis of topics in biochemistry including protein structure, methods of structure determination and prediction, protein folding, and protein dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5781, covering the same topics except for the requirement of a written research proposal.

Requisites: Requires prerequisite course of CHEM 5770 (minimum grade B-). Restricted to graduate students only.

CHEM 5781 (5) Advanced General Biochemistry 2

Lect. Detailed consideration of contemporary topics in biochemistry, including protein structure (primary, secondary, tertiary, and quaternary), methods of structure determination and prediction, protein folding (kinetics, thermodynamics, denaturation, and renaturation), and protein dynamics (internal motions and methods of analysis).

Requisites: Requires prerequisite course of CHEM 5771 (minimum grade B-). Restricted to graduate students only.

CHEM 5791 (3) Bioorganic Chemistry in Biotechnology

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4791

Requisites: Restricted to graduate students only.

CHEM 5801 (3) Advanced Signal Transduction and Cell Cycle Regulation

Lect. Advanced discussion of current research and literature in signal transduction, including ligands, receptors, and intracellular signaling pathways, as well as control on transcription, chromatin structure, DNA replication, mitosis, and cell cycle progression.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210 or MCDB 5220.

CHEM 5811 (3) Advanced Methods in Protein Sequencing and Analysis

Lect. Advanced discussion of current methods in protein sequencing, sequence analysis, and posttranslational modifications, emphasizing techniques of mass spectrometry, use of protein databases, sequence alignment and motifs, structure prediction, and modeling of signaling pathways. Department consent required.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210.

CHEM 5821 (1) Special Topics in Signaling and Cell Regulation

Lect. Reviews and evaluates literature on subjects of current interest in signal transduction transcription, cell cycle progression, and cell regulation. Primarily for graduate level presentation of special topics by students, faculty, and research staff. Department consent required.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6001 (1) Seminar: Inorganic Chemistry

Student, faculty, and guest presentations and discussions of current research in inorganic chemistry and related topics (transition element and main group element compound properties, inorganic compound in biological, industrial, and materials applications). Required of all inorganic chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

Requisites: Restricted to graduate students only.

CHEM 6021 (1-3) Special Topics in Inorganic Chemistry

Lect. Subjects of current interest in inorganic chemistry. Primarily used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6031 (3) Special Topics in Nanoscience

Introduces the synthesis, physical properties, and applications of nanometer-scale materials and devices. Includes synthesis of metal and semiconductor nanoparticles and nanowires, optical and electronic properties of nanoscale systems, and applications in biotechnology and energy.

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4511 (all minimum grade B-) or graduate standing.

CHEM 6101 (1) Seminar: Analytical Chemistry

Student, faculty, and guest presentations and discussions of current research in analytical chemistry. Required of all analytical chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

Requisites: Restricted to graduate students only.

CHEM 6111 (1-3) Special Topics in Analytical Chemistry

Lect. Subjects of current interest in analytical chemistry. Used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6301 (1-3) Seminar in Organic Chemistry

Discussions principally concerned with recent literature in organic chemistry. Required of all organic chemistry graduate students.

Requisites: Restricted to graduate students only.

CHEM 6311 (1-3) Special Topics in Synthetic Organic Chemistry

Lect. Selected topics in synthetic organic chemistry, encompassing both methods and/or total synthesis of complex molecules.

Requisites: Requires prerequisite course of CHEM 5311 (minimum grade B-). Restricted to graduate students only.

CHEM 6321 (1-3) Special Topics in Physical Organic Chemistry

Lect. Selected topics in physical organic chemistry, which may include photochemistry, carbene chemistry, free radical chemistry, molecular orbital methods, organic materials, or gas phase ion chemistry.

Requisites: Requires prerequisite course of CHEM 5321 (minimum grade B-). Restricted to graduate students only.

CHEM 6401 (1-3) Seminar: Physical Chemistry

Student, faculty, and guest presentations of current research in physical chemistry. Discussion of research topics related to the subject of weekly physical chemistry/chemical physics seminar and appropriate journal articles.

Requisites: Restricted to graduate students only.

CHEM 6411 (1-3) Advanced Topics in Physical Chemistry

Lect.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6601 (1) Biochemistry Seminar

Required of all biochemistry graduate students. Credit is deferred until presentation of satisfactory seminar.

Requisites: Restricted to graduate students only.

CHEM 6621 (1) Special Topics in RNA

Reviews and evaluates recent scientific literature in the field of RNA chemistry and biology, including topics in structure, catalysis, bioinformatic approaches and control of gene expression. Primarily for graduate level presentation of special topics by students and research staff.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 6621

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6711 (3-6) Advanced Topics in Biochemistry

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6731 (3-6) Advanced Topics in Biochemistry

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6801 (0) Departmental Research Seminar

Lectures by visiting scientists and occasionally by staff members and graduate students on topics of current research. Meets once a week. Required for all graduate students in chemistry.

Requisites: Restricted to graduate students only.

CHEM 6901 (1-6) Research in Chemistry

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6941 (1) Master's Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

CHEM 6951 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

CHEM 7021 (2) Seminar: Structural Inorganic Chemistry

Current research in the area of structural inorganic chemistry. Concerns topics related to electronic and molecular structure of transition metal complexes. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7101 (2) Seminar: Chromatography and Trace Analysis

Student and faculty discussions and reports on research advances in chromatography, trace analysis and environmental chemistry.

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7111 (2) Seminar: Electrochemistry

Student and faculty discussions and reports on research advances in electrochemistry. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7131 (1) Seminar in Atmospheric Aerosol Chemistry

Discusses advances in atmospheric aerosol chemistry, with emphasis on new methods for analysis and their application to laboratory and field studies.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5151 and CHEM 5181.

CHEM 7161 (1) Seminar: Heterogeneous Atmospheric Chemistry

Topics in atmospheric chemistry emphasizing the structure and reactivity of atmospheric particulates. Presentations on current research and critical evaluations of recent literature. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7211 (1) Seminar: Topics in Synthetic Methodology and Natural Product Synthesis

Discussion of contemporary synthetic organic chemistry with a focus on new methodology and total synthesis of natural products.

Requisites: Restricted to graduate students only.

CHEM 7221 (1) Seminar: Photochemistry and Free Radical Chemistry

Current research in areas of organic free radical chemistry, photochemistry, and related topics are presented and discussed. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7231 (1) Seminar: Reactive Intermediates

Application of contemporary ideas of chemical physics to organic molecules. Special attention to structures and bonding in organic ions and radicals. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7241 (1) Seminar: Synthetic Organic Chemistry

Series of seminars on directed total synthesis. Emphasizes modern synthetic methodology and applications to total synthesis of natural products. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7251 (1) Selected Topics in Chemical Genetics

Discusses the brief history of the emerging field of chemical genetics, and focuses on the recent development of concepts, techniques, applications, and its impact on both science and human health.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7271 (1) Seminar: Picosecond Dynamics of Reactions

Includes development and application of picosecond laser spectroscopy to organic and organometallic reactions. Emphasizes relationship between current theoretical developments and experiments. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7281 (1) Seminar: Molecular Self-Assembly

Discusses current topics and recent advances in molecular self-assembly, with emphasis on new liquid crystal designs and applications.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7291 (1) Seminar: Physical Organic Chemistry

Modern experimental techniques and theoretical models in physical organic chemistry are discussed in relation to the development of new materials, such as molecular size tinkertoys to the development of novel photochemical systems and their spectroscopies. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7301 (1) Seminar: Synthetic and Mechanistic Chemistry

Discusses particularly the synthesis of complex organic molecules and the mechanism of reagents used in organic synthesis. Includes a study of transition metal mediated organic reactions. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7311 (1) Selected Topics in Organic Materials

Current research in the area of organic/materials chemistry. Concerns topics related to organic materials synthesis, carbon nanotube functionalization, artificial photosynthesis, gas storage and catalysis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7401 (1) Seminar in Photochemical Reaction Control

Discusses progress towards control of molecular reactivity using light, including synthetic methods for creating control subjects. Emphasizes new methods to achieve coherent control.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7421 (2) Seminar: Negative Ion Chemistry

Chemistry of negative ions; experimental methods and designs; laser spectroscopy of ions; theoretical methods; reactive dynamics of ions in the gas phase. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7431 (1) Seminar: Topics in Theoretical Chemical Physics

Seminars presented on a variety of topics in theoretical chemical physics. Molecular collisions and unimolecular dynamics predominantly featured. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7441 (2) Research Seminar: Theoretical Chemistry

Studies theoretical description of molecular dynamics as related to rate processes. Focuses on chemical reactions in liquids, absorption-desorption on surfaces, nucleation reactions, and energy flow in molecules. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7461 (1) Seminar: Gas Phase Ion Chemistry

Studies gas phase ion chemistry relevant to thermochemical measurements and atmospheric, interstellar, and biomedical applications.

Requisites: Restricted to graduate students only.

CHEM 7471 (1) Seminar in Ultrafast Spectroscopy of Proteins

Discusses advances and developments in biomolecular dynamics, and considers the connection of protein dynamics with function. Emphasizes experimental studies via ultrafast laser spectroscopy.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7481 (2) Seminar: Molecular Spectroscopy and Photochemistry

Discussion and presentation of current research in spectroscopy and photochemistry of organic as well as organometallic systems. Reviews state of the art techniques available for the theoretical and experimental characterization of excited states. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7491 (1) Seminar: Molecular Vibrational Dynamics

Topics pertaining to vibrational dynamics of small molecules are discussed, with particular emphasis upon IR laser spectroscopy, van der Waals' clusters, vibrationally induced dipole moments, and predissociation. Discussion of current research and recently published literature. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7501 (1) Seminar: Theoretical Molecular Dynamics

Variety of topics in theoretical chemical physics, emphasizing dynamics of molecules in dissipative environments or in radiation fields. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7511 (1) Seminar: Reaction Dynamics in Condensed Phases

Studies elementary steps in chemical reactions and their observation by ultrafast spectroscopy. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7521 (1) Seminar: Atmospheric Kinetics and Photochemistry

Discusses laboratory studies of degradation mechanisms. Applies these studies to atmospheric phenomena such as global warming and stratospheric ozone loss. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7531 (1) Seminar: Surface Chemistry and Thin Film Growth

Topics in surface chemistry and thin film growth with focus on atomic layer deposition (ALD) and molecular layer deposition (MLD). Properties of thin films grown using ALD and MLD. Applications of thin films in areas including flexible displays, energy storage and catalysis. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7551 (1) Selected Topics in Ion Spectroscopy

Treats current topics in the spectroscopy of ions. Seminar lectures are given by graduate students on their research and on literature topics, and the results of both in-house and external research groups are studied. Additionally, ideas for interesting directions of research and new experiments are proposed and discussed.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7601 (2) Seminar: Nucleic Acid Chemistry

Topics in various aspects of current research; emphasizes student readings and presentations. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7611 (1) Seminar: Structures and Dynamics of Biopolymers in Solution

Discussion of experimental and theoretical approaches for probing structures and dynamics of proteins, peptides, and nucleic acids; and computations in molecular dynamics simulation, modeling, and geometry. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7621 (1) Seminar: Biochemistry and Molecular Biology of Signal Transduction

Discusses and reviews the current literature and experimental results in signal transduction, cell cycle and tumor suppressor gene regulation. Emphasizes the understandings of molecular and biochemical mechanisms of the origin of human tumor cells.

Requisites: Restricted to graduate students only.

CHEM 7651 (2) Seminar: Environmental Biochemistry

Topics in various aspects of current biochemical and environmental research. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7661 (1) Structure/Function of Human Mediator Transcription Complexes

Study of the mechanisms of eukaryotic gene expression with an emphasis on the structure and function of human mediator transcription complexes.

Requisites: Restricted to graduate students only.

CHEM 7671 (1) Seminar: Topics in Designing Probes for Signaling Reactions

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered.

Requisites: Restricted to graduate students only.

CHEM 7691 (1) Seminar: Protein Dynamics and the Mechanism of Sensory Proteins

Discusses recent results and current literature in the areas of the mechanism of sensory proteins, internal motions of proteins, and protein folding. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7701 (1) Seminar: Enzyme Mechanisms and Kinetics

Studies experimental approaches to understand the mechanisms of enzymic catalysis. Techniques include steady-state and pre-steady-state kinetics, isotope trapping and partitioning, inhibition by substrate analogues, and covalent modification of proteins. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7711 (1) RNA Mediated Inorganic and Organic Reactions

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered.

Requisites: Restricted to graduate students only.

CHEM 7741 (1) Seminar: Signal Transduction and Protein Phosphorylation

Devoted to experimental methods for understanding mechanisms of signal transduction in mammalian cells through pathways involving regulation of protein phosphorylation. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7751 (1) Seminar: Protein Structure and Folding

Studies structure and folding of proteins and protein complexes using biophysical methods, including nuclear magnetic resonance (NMR), circular dichroism, and fluorescence spectroscopies. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7761 (1) Seminar: Eukaryotic Transcriptional Regulation

Studies the regulation of transcription by RNA Polymerase II from human promoters. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7781 (1) Seminar: Topics in Structural Biology

Discussion of advances and developments in structural biology with emphasis on new methods for protein expression, purification and crystallization; and structure solution implementation.

Requisites: Restricted to graduate students only.

CHEM 7791 (1) Seminar: Topics in Ribonucleoprotein Assemblies

Studies aspects of the biochemical and structural analysis of ribonucleic acid (RNA) and its interactions with proteins and assemblies into functional ribonucleoprotein (RNP) enzymes. Techniques focus on x-ray crystallography, spectroscopic methods, and biochemical probing.

Requisites: Restricted to graduate students only.

CHEM 8991 (1-10) Doctoral Dissertation

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Biochemistry - Master of Science (MS)

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

Requirements

Language Requirement

The department does not require foreign language proficiency for the master's degree.

Examinations

Administration of preliminary examinations varies, depending on the student's entering field. Candidates opting for MS Plan I must pass a master's thesis defense examination at the time they complete their work. MS Plan II does not require a final oral examination.

Required Courses and Semester Credit Hours

There are two methods of obtaining a master's degree from the Department of Chemistry and Biochemistry. Both plans are available only with departmental approval.

Plan I: Thesis

This plan requires 30 credit hours, including 15 credit hours of formal course work, 15 credit hours in research/seminar courses, the completion of a research investigation and the presentation of a thesis.

Plan II: Research Report

This plan requires 30 credit hours including 21 credit hours of formal course work plus 9 credit hours of research/seminar and presentation of a research report, but no thesis.

Chemistry - Master of Science (MS)

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

Requirements

Language Requirement

The department does not require foreign language proficiency for the master's degree.

Examinations

Administration of preliminary examinations varies, depending on students' entering field. Candidates opting for MS Plan I must pass a master's thesis defense examination at the time they complete their work. MS Plan II does not require a final oral examination.

Required Courses and Semester Credit Hours

There are two methods of obtaining a master's degree from the Department of Chemistry and Biochemistry. Both plans are available only with departmental approval.

Plan I: Thesis

This plan requires 30 credit hours, including 15 credit hours of formal course work, 15 credit hours in research/seminar courses, the completion of a research investigation and the presentation of a thesis.

Plan II: Research Report

This plan requires 30 credit hours including 21 credit hours of formal course work plus 9 credit hours of research/seminar and presentation of a research report, but no thesis.

Biochemistry - Doctor of Philosophy (PhD)

The Department of Chemistry and Biochemistry is internationally recognized for its research and education. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas, including analytical, atmospheric, biochemistry, biophysical, chemical physics, environmental, organic, materials and nanoscience, and physical chemistry.

Graduate students enjoy extensive scientific collaboration with chemistry and biochemistry faculty; with other departments, such as physics and molecular, cellular and developmental biology; and with research institutes and agencies, such as the Cooperative Institute for Research in Environmental Sciences (CIRES), Joint Institutes of Laboratory Astrophysics (JILA) and the National Oceanic and Atmospheric Administration (NOAA).

The Biochemistry Division offers a world-class interdisciplinary research environment in a beautiful mountain setting. Established in 1986, the Biochemistry Division spans a wide range of fields, from bioinformatics and cellular and molecular biology to synthetic and biophysical chemistry. Current areas of focus involve:

- nucleic acid chemistry and biochemistry, including RNA structure and function and mechanisms of transcription and replication
- structural biology, including X-ray and NMR, proteomics and informatics
- molecular biophysics and signal transduction
- proteomics, genomics and bio-informatics

Requirements

Course Requirements

General Requirements

Sixty credit hours of course work is required, consisting of 30 hours of research in CHEM 8991, at least 15 hours in formal courses (see next section), and the remainder in other courses, such as summer courses, seminar courses, group meeting courses and research in CHEM 6901. All students are required to take a 1-credit course in Scientific Ethics and Responsible Conduct in Research (CHEM 5776).

A minimum grade of B- is required in all courses counting for the PhD degree; students should also be aware that they must maintain a cumulative grade point average of 3.0 in all formal courses and an overall grade point average of 3.0 or they will be placed on academic probation. Students may also be placed on probation if they are not making satisfactory progress in their research. Probationary status must be removed within two semesters or a student will become ineligible to receive a PhD degree from the Department of Chemistry and Biochemistry. Students on probation will not have a high priority for financial support.

A degree plan of courses taken and yet to be taken must be filed with the Graduate School by the end of the student's third semester.

Selection of Formal Courses

All students are required to take a minimum of 15 credit hours of formal courses. Formal courses are regularly scheduled, examined and graded; courses such as summer courses, seminar courses, group meeting courses and research in CHEM 6901 are not considered formal courses.

Each student's program plan for course work must be approved by the student's research advisor and the Biochemistry Graduate Committee. These formal courses must be approved prior to the end of the fourth semester, and students are encouraged to complete formal course requirements within their first four semesters. The Biochemistry Division recognizes that some formal courses of interest are only offered every two years, and the Biochemistry Graduate Committee takes this into account.

Transfer of Credit

Up to 10 credit hours of graduate-level, formal coursework may be transferred from another school subject to demonstrated proficiency in the subject(s) and written approval by the Biochemistry Graduate Committee. Students can obtain forms for this purpose from the graduate secretary.

Formal Application of Admission for Candidacy for the Biochemistry PhD Degree

All students must make formal application for admission to candidacy for the PhD degree before they take their comprehensive oral examination. Students can obtain the appropriate form from the graduate administrative assistant. This Graduate School requirement should be fulfilled even though students have not completed all their formal course work. After filling in the form, indicating graduate courses taken and to be taken, it should be approved and signed by the student's research advisor and then the Biochemistry Graduate Committee. A completed form needs to be in the student's file before they can take the comprehensive oral examination.

PhD students shall have passed their written cumulative exam and the oral comprehensive examination before being admitted to candidacy for the PhD degree. Students should note that the approved research proposal must be filed in order for a student to be advanced to candidacy.

Research Requirements

During the course of the PhD thesis work, students will arrange annual meetings with a thesis advisory committee composed of their research advisor and two other biochemistry faculty. The purpose of these advisory meetings is to ensure the student is making adequate progress on a suitable PhD thesis project. The final annual meeting should be scheduled about one year from the end of the thesis work. For this meeting, the advisory committee will be expanded to five faculty members: the thesis advisor, three biochemistry faculty and one faculty member from another department. This committee will become the examination committee that evaluates the results of a completed research program submitted as a thesis for the final examination as described above.

Examination Requirements

Each PhD student is required to satisfy a preliminary examination and pass a series of comprehensive examinations to be advanced to candidacy. The candidate must then pass a final thesis defense examination to be awarded the PhD degree. Interdisciplinary students should adhere to specific program requirements.

Preliminary Examinations

The Graduate School requires that the department administer preliminary examinations in order to "satisfy itself (by examination or other means) that students who signify intent to undertake the PhD degree are qualified to do so." The Biochemistry Division preliminary examination will be conducted at the end of the student's second semester by a committee of three or more members of the division. The record of

each student, including undergraduate preparation, performance in graduate course work, TA performance and performance in laboratory rotations will be reviewed, and a recommendation will be made on the qualification of the student to continue in the PhD program. Outcomes may include recommendation for additional course work, delay in joining a research lab or a recommendation to leave the program. Students who are considering interdivisional work should consult the Biochemistry Graduate Committee for advice on the preliminary examination requirement.

Language Requirements

The Graduate School rules state that "a student who is noticeably deficient in the written and/or oral use of the English language cannot obtain an advanced degree from CU Boulder." The department assesses the English language proficiency of each PhD student in the oral comprehensive examination.

The department does not require proficiency in a foreign language for the PhD degree.

Comprehensive Examinations

The comprehensive examinations are made up of three parts: a written examination, an oral examination and the evaluation of an original research proposal. The oral examination and the research proposition evaluation shall be conducted by a five member examining board, according to the rules of the Graduate School. One member of this board shall be the student's research advisor. The membership of this board shall be selected by the Biochemistry Graduate Committee, in consultation with other faculty members as necessary. The comprehensive examinations are considered passed when the requirements of all parts have been met.

Written Comprehensive Examination

All biochemistry PhD students will take a written comprehensive examination at the end of their first year. If a student fails the exam, they may be encouraged to take classes in fall semester of their second year to help make up for deficiencies, and they must take the written exam again. The student can still take their oral comprehensive exam, but they will not be able to advance to candidacy until they pass the written exam. The written comprehensive examination will remain in the student's folder, and will be available to the orals committee to help them determine whether the student is capable of PhD work.

The written comprehensive examination for the biochemistry PhD will be written and graded by a selection of faculty within the department. The Biochemistry Graduate Committee is responsible for the overall administration of the process, and will certify that each PhD candidate has satisfied the examination requirements as stated above.

Oral Comprehensive Examination

Students must take the oral comprehensive examination no later than the end of the fourth semester. This examination will include questioning on two topics: the student's research and general topics. Students are expected to demonstrate a clear understanding of their thesis research and fundamental knowledge in biochemistry, and show the ability to think creatively. Students are strongly advised to spend time reviewing material from chemistry and biochemistry courses they have taken as undergraduates and graduates, since this material is often the subject of questioning during the examination.

The oral examination committee consists of three of the five faculty members appointed to the examining board selected by the Biochemistry Graduate Committee. The student's research advisor, while a member of the examining board, may not be a member of this committee.

Students are responsible for arranging the examination date with their committee and should notify the graduate secretary two weeks prior to the scheduled date. At least one week before the exam date, students will present a short written overview (5 single-spaced pages) of their thesis research plan to each committee member. This overview will outline clearly the direction of the student's thesis, provide the committee with advance notice of the thesis research area, and will describe promising research results (if any).

The decision of the oral examining board shall be determined by a simple majority of the members. The committee shall determine whether the student is capable of PhD degree work or not. The possible outcomes of the examination are:

PASS: The student's performance on the examination was PhD caliber.

INCOMPLETE: The student's performance was PhD caliber in some areas, but was below what is expected for a PhD student in other important areas. In this case, the committee will give the student a set of specific requirements to fulfill and will reconvene in no more than three months to complete the examination. If the examination is not completed within the three-month period, it is considered a fail.

FAIL: The student's performance on the examination was not PhD caliber. By Graduate School rules, a student has the option of requesting a second attempt of this examination. This request should be made to the Biochemistry Graduate Committee. Before the student can take a second exam, the committee may require that the student completes class work to remediate deficiencies and/or completes a research master's degree. If the request for a second examination is granted, it will occur no later than a year from the first exam, but the committee may set an earlier date. For the second examination, the oral committee is expanded to five faculty, with at least two from the first examination. The result of this examination will be limited to pass or fail. If a student doesn't take this second examination by the date specified by the committee, they will not be able to continue in the PhD program.

Out-of-Field Research Proposal

Each graduate student in the department is required to write an out-of-field research proposal. Biochemistry students write and defend such a proposal in Advanced General Biochemistry 2 (CHEM 5781) (spring semester "core"). Biochemistry students should make note of critiques of the proposal, rewrite it and hand it in to the CORE instructor for final approval. The final copy of the approved proposal needs to be in the student's file before they can take the written comprehensive examination.

Upon satisfactory completion of all three examination requirements, the five members of the examination board shall recommend the student for advancement to candidacy for the PhD degree.

Final Examination

This examination is primarily a defense of the candidate's thesis. The examining committee consists of the student's thesis advisor as chair, and four other faculty members, at least one of whom is rostered outside of the department. These committee members are selected by the Biochemistry Graduate Committee upon request and after consultation with the student. The student must arrange for one of these other committee members to be the "second reader" of the thesis. The second reader will carefully review the thesis with the candidate. The student is responsible for arranging the date of the examination and notifying the graduate secretary at least two weeks prior to the date, and is responsible for distributing copies of the dissertation to the committee members — after it has been approved by the thesis advisor — at least two weeks

before the examination. Failure to meet this latter deadline is a legitimate reason for any thesis committee member to postpone the examination.

Time Limit

Students should note the time limit specified in the Graduate School rules: "All doctoral students are expected to complete all degree requirements within six years from the date of the start of course work in the program." Information on extensions is available in the Doctoral Degree Requirements (p. 868) section.

Petitions

With the approval of the thesis advisor, students may petition for exceptions to the above mentioned rules due to special circumstances. The petition should be addressed to the Biochemistry Graduate Committee, which may consult with other faculty before responding to the petition.

Chemical Physics - Doctor of Philosophy (PhD)

Chemical physics is a discipline at the interface between chemistry and physics. Chemical physics applies physical methods and theory to study molecular and collective properties of matter. The focus is on understanding complex phenomena from gas phase molecular dynamics, to nanoscale, mesoscale and biological phenomena, through model systems and fundamental physical principles.

The chemical physics program allows students to strike a balance between core courses and courses that are better suited to address the student's specific research goals and interests. Students must consult with the chemical physics graduate advisors in their parent departments, either chemistry and biochemistry or physics, to plan their formal course work.

This program is administered by an interdepartmental committee. For more information, contact the graduate program manager in either the Department of Chemistry and Biochemistry (chemgrad@colorado.edu) or the Department of Physics (Jeanne.nijhowne@colorado.edu).

Requirements

Program Admissions

Graduate students in good standing in either the chemistry or physics PhD program may declare their intent to work toward a PhD in chemical physics by notifying the chair of the chemical physics program. The department that originally admitted a student is referred to as their home department. Newly admitted students with an interest in the chemical physics PhD should consult with both their home departmental advisor and their chemical physics graduate advisor for advice on initial course selection. Advanced students must be in good standing in their home department and able to complete the chemical physics PhD within the time limit set by the Graduate School in order to declare their intent to work toward the chemical physics PhD. Once they have been accepted by the Graduate Advisor in chemical physics to enroll for candidacy in the PhD program in chemical physics, the graduate advisor will notify the graduate secretary in their home department to have their major code changed to CPHY.

Once a student has declared their intent to work toward a PhD in chemical physics, the preliminary examination shall be conducted by the chemical physics graduate advisor. The exam shall review all completed courses, undergraduate and graduate, related to chemical physics. The

student must also earn grades of B or better in at least six credit hours of University of Colorado graduate courses that have been approved for the PhD in chemical physics by the graduate advisor. Students must pass the preliminary examination within two semesters of declaring their intent to work toward a PhD in chemical physics. Students are formally admitted to the chemical physics PhD program when they pass the preliminary examination.

Courses

General Requirements

Students must complete a program of formal courses (see "Selection of Formal Courses" below) approved by their PhD thesis advisor and the Committee on Chemical Physics. Students must file an approved degree plan of courses already taken, in progress and planned for future semesters with the Graduate School by the end of their fourth semester. The 30 doctoral dissertation credit hours required by the Graduate School may be completed in either CHEM 8991 or PHYS 8990.

A minimum grade of B# is required in all courses counted for the PhD degree. Students must maintain both a cumulative grade point average of 3.0 in their program of formal courses and an overall grade point average of 3.0.

Selection of Formal Courses

The chemical physics program makes the distinction between formal and graduate level courses. All students will be required to complete an approved program of formal courses that contains at minimum 6 credit hours of formal course work. Formal courses are graded based on individual course work. Many graduate level courses are not considered formal courses in the context of the chemical physics PhD requirements, but may be counted toward Graduate School course requirements. Each student's degree plan for course work must be approved by the student's PhD thesis advisor and a chemical physics graduate advisor. The formal courses shall be chosen to develop the student's competency in classical mechanics, quantum mechanics, thermodynamics and statistical mechanics, electricity and magnetism, chemical kinetics, and in their area of thesis research.

Transfer of Credit

Up to 10 credit hours of graduate level, formal course work may be transferred from another school, subject to demonstrated proficiency in the subject(s), approval by the Chair of the Committee on Chemical Physics, and approval by the Graduate School. Forms for this purpose can be obtained from the graduate program manager.

Formal Application for Admission to Candidacy for the PhD Degree

All students must make formal application for admission to candidacy for the PhD degree by the fourth semester. The required forms can be obtained from the graduate program manager. This Graduate School requirement should be fulfilled even if the student has not completed all the courses required by their degree plan. To satisfy Graduate School requirements, the degree plan may include graduate-level courses that are not approved as formal courses in chemical physics, but the degree plan must include the student's approved program of formal courses in chemical physics. After filling in the form, indicating graduate courses taken and to be taken, it should be approved and signed by the student's PhD thesis advisor and then by the Chair of the Committee on Chemical Physics.

Examination Requirements

Each student is required to pass a preliminary examination before admission to the program. Each student in the program is required to pass a comprehensive examination to advance to candidacy. After completing all graduate school and course requirements, the candidate must then submit a dissertation and pass a final dissertation defense to be awarded the PhD in chemical physics.

Language Requirements

Foreign Language Requirement

The program does not require proficiency in a foreign language for the PhD degree.

English Language Proficiency

The English language proficiency required for an advanced degree by the Graduate School will be assessed for each student through written course work and in the oral portion of the comprehensive examination.

Advancement to Candidacy

Advancement to candidacy for the PhD in chemical physics requires that the student select a PhD thesis advisor, complete a program of courses approved by the PhD thesis advisor and the Committee on Chemical Physics, write a proposal describing their proposed PhD thesis research, and pass a comprehensive examination covering chemical physics and the proposed thesis research. The oral examination should normally be completed by the end of the second year.

The comprehensive examination shall be conducted by a five member Comprehensive Exam Committee (CEC), according to the rules of the Graduate School. The CEC shall consist of graduate faculty from the Department of Chemistry and Biochemistry and the Department of Physics; there must be at least one member from each department. One member of the CEC shall be the student's thesis advisor. The membership of the CEC shall be selected by the student, but must be approved by the PhD thesis advisor, the graduate advisor and the Graduate School.

In order to attempt the oral examination, the student must demonstrate satisfactory progress toward completing their approved program of courses and submit an application for candidacy to the Graduate School at least two weeks in advance of the scheduled oral examination. Students are responsible for arranging the examination date, time and place with their CEC and should notify the chemical physics program chair and their departmental graduate secretary at least two weeks prior to the scheduled date. The candidate must schedule the exam so that all members of the board are available for a full two hours.

One week in advance of the oral examination, the student should submit a written proposal to their CEC that demonstrates suitability of the project for a PhD thesis, adequate background knowledge of chemical physics, the field of research and the relevant literature. The oral examination will assess the student's competence in the core areas of chemical physics: elementary physics and chemistry, quantum mechanics, chemical kinetics, thermodynamics and statistical mechanics, electricity and magnetism, as well as the student's research plans. The research advisor is strongly encouraged to attend the oral examination, but is recused from final discussion and voting on the outcome. Three (out of four) passing votes are needed for the CEC to approve the written proposal and the oral examination. A pass may be conditional or unconditional.

If the student does not pass the oral examination, the committee may recommend additions to the approved program of courses in chemical physics or that the student complete the MS or PhD program

in their home department (note that there is no MS degree program in chemical physics). A student who does not pass has the right to attempt the examination once more after a period of time set by the CEC. Advancement to candidacy occurs when all examination requirements and conditions have been met.

Annual Progress Review

Students in chemical physics must complete the annual progress review required in the third year and beyond.

Dissertation Defense

This examination is primarily a defense of the candidate's thesis. The examining committee consists of the student's PhD thesis advisor as chair and four other faculty members, at least three of whom must be from the Department of Chemistry and Biochemistry and the Department of Physics, with at least one from each department. These committee members are selected by the program chair upon request by and after consultation with the student and must be approved by the Graduate School two weeks in advance.

The student must arrange for one of these other committee members to be the "second reader" of the thesis. The second reader will carefully review the thesis with the candidate. The student is responsible for arranging the date, time and location for the defense, notifying their home department's graduate program manager in time for the appropriate approvals by the Graduate School, and distributing copies of the dissertation to the committee members at least two weeks before the defense.

Failure to meet this latter deadline is a legitimate reason for any thesis committee member to postpone the dissertation defense. A passing defense requires an affirmative vote from at least four out of five committee members. A student who does not pass has the right to attempt to defend the dissertation once more after a period of time set by the examining committee.

Dissertation Requirements

A doctoral student writes a dissertation based upon their own original investigation. The dissertation must demonstrate mature scholarship, critical judgment and a familiarity with the tools and methods of research.

- Every dissertation presented in partial fulfillment of the requirements for an advanced degree must represent the equivalent of at least 30 credit hours of work.
- The student is responsible for notifying the Graduate School of the exact title of the dissertation on or before the posted deadlines during the semester in which the doctoral degree is to be conferred.
- The dissertation must comply in mechanical features with the specifications for theses and dissertations available in the Graduate School.
- The dissertation must be submitted electronically before the posted deadline in order to graduate in a given semester. It should be submitted to <http://www.etsadmin.com/colorado>. A signature page with at least two original signatures must also be turned in to the Graduate School office by the end of the business day on or before the dissertation deadline.
- The final grade is withheld until the dissertation is completed. In progress (IP) grades are assigned during each semester until the defense is successfully completed. The final copy of the dissertation is accepted by the examination committee, at which time the final

grade for all dissertation hours is submitted to the Graduate School on a final grade card.

Chemistry - Doctor of Philosophy (PhD)

The Department of Chemistry and Biochemistry is internationally recognized for its research and education. As part of a commitment to continuing this tradition of excellence, the department provides a graduate program that integrates opportunities for cutting-edge creative research and study across a wide range of areas, including analytical, atmospheric, biochemistry, biophysical, chemical physics, environmental, organic, materials and nanoscience, and physical chemistry.

Graduate students enjoy extensive scientific collaboration with chemistry and biochemistry faculty; with other departments, such as Physics and Molecular, Cellular and Developmental Biology; and with research institutes and agencies, such as the Cooperative Institute for Research in Environmental Sciences (CIRES), Joint Institutes of Laboratory Astrophysics (JILA) and the National Oceanic and Atmospheric Administration (NOAA).

The course work for this program is tailored to the individual student's research interests and needs. Although course offerings vary each year, approximately 40 graduate-level courses are offered annually, covering topics of important and contemporary interest in all areas of chemistry and biochemistry. Students are also given the chance to familiarize themselves with faculty research by attending seminars by faculty on their research and research group meetings, and by individual meetings with faculty members.

PhD program students complete a number of other requirements, including a comprehensive examination, which consists of written cumulative examinations, and an oral examination. At some point later in the program, students complete an original research proposal and give a seminar to the department on a topic outside their own research. Most students graduate with their PhD in about five years.

Requirements

Examination Requirements

Each PhD student is required to satisfy divisional preliminary examinations and pass a series of comprehensive examinations to be advanced to candidacy. The candidate must then pass a final thesis defense examination to be awarded the PhD degree. Interdisciplinary students should adhere to specific program requirements.

Preliminary Examinations

The Graduate School requires that the department administer preliminary examinations in order to "satisfy itself (by examination or other means) that students who signify intent to undertake the PhD degree are qualified to do so." The format of the departmental preliminary examination of each student will be a responsibility of the division that admits them. The preliminary examination will be completed before the end of the second semester of study. Students will be required to follow the format of the preliminary examination of the division that admits them. Students who are uncertain of their division or who are considering an interdivisional major should consult the graduate advisor for advice on the preliminary examination requirement.

Language Requirements

The Graduate School rules state that "a student who is noticeably deficient in the written and/or oral use of the English language cannot obtain an advanced degree from CU Boulder." The department assesses the English language proficiency of each PhD student in the oral comprehensive examination.

The department does not require proficiency in a foreign language for the PhD degree.

Comprehensive Examinations

The comprehensive examinations are made up of three parts: a series of cumulative examinations, an oral examination and evaluation of an original research proposal. The oral examination and the research proposition evaluation shall be conducted by a five-member examining board, according to the rules of the Graduate School. One member of this board shall be the student's research advisor, and one member shall be from outside the primary field of study of the student. The membership of this board shall be selected by the Graduate Advisor, in consultation with other faculty members as necessary. The comprehensive examinations are considered passed when the requirements of all parts have been met.

Cumulative Examinations

The cumulative examinations are given in each division eight times a year from September through May on the first Saturday morning of each month except January. Students must take each examination from the beginning of their third semester and pass six before failing eleven. Students will usually take only the examinations offered in their division, but may elect to take up to three in other divisions; in these cases, students must inform the graduate program manager of their intentions prior to the examination date. Students in the atmospheric program will be advised on the selection of the appropriate examinations. An examination that is not taken counts as a failure unless the student has been excused *in writing* from the examination by the graduate advisor. During the first year, the student may elect to take one or more examinations with the advantage that only half of the failed exams are counted; half-failures are rounded to the lower number. Students should note that they are not allowed to read the exam(s) and then leave without taking the exam without penalty of a failure.

A student completing a master's degree in this department, either voluntarily or on the recommendation of the PhD oral examination committee, may wish to be considered for admission to the PhD program. Such students must take the cumulative examinations from the beginning of their third semester (voluntary MS) or continue with examinations (recommended MS), to assist the Graduate Scholastic Committee in deciding upon admission.

Oral Comprehensive Examination

Students must take the oral comprehensive examination no later than the end of the fourth semester. Master's degree students in this department who wish to continue for a PhD degree must take the oral examination no later than the end of the fifth semester even if they have not completed the master's degree.

This examination will include questioning on two topics: the student's research, and general topics. Students are expected to demonstrate a clear understanding of their thesis research and fundamental knowledge in chemistry, and show the ability to think creatively. Students are strongly advised to spend time reviewing material from chemistry and biochemistry courses they have taken as undergraduates and graduates, since this material is often the subject of questioning during the examination.

The oral examination committee consists of three of the five faculty members appointed to the examining board selected by the graduate advisor. The student's research advisor, while a member of the examining board, may not be a member of this committee. The decision of this committee shall be determined by a simple majority of the members. The committee shall determine whether the student is capable of PhD degree work, master's degree work or no advanced degree work. The committee may require that the student repeat the examination, and/or may require the student to take additional courses. The committee may require that the student complete a thesis master's degree before continuing on to the PhD; in this case, the committee will decide if it is necessary for the student to repeat the oral comprehensive examination at some time during the completion of the master's degree research. The committee may also require that a student complete a master's degree (thesis or course work MS), and then leave the graduate program. As described in the Graduate School rules, students who fail the examination have the right to request a second attempt; in this case, the student should contact the Graduate Scholastic Committee.

Students are responsible for arranging the examination date with their committee and should notify the graduate secretary two weeks prior to the scheduled date. At least one week before the exam date, students will present a short written overview (approximately 5 pages) of their thesis research plan to each committee member. This overview will outline clearly the direction of the student's thesis, provide the committee with advance notice of the thesis research area, and will describe promising research results (if any). Students might be asked at the time of the exam to describe and defend alternate experimental approaches to their research goals.

Research Proposal

Upon completion of the oral comprehensive examination, each student shall submit an original research proposal on a topic not related to the student's thesis research to the two members of the examination board who were not members of the oral examination committee. The proposal may be written as a part of any graduate course in the department where written proposals are required, or may be written as a part of an individual's group meeting activity. It is the thesis advisor's primary responsibility to assure that the proposal is original. The proposal must obtain the approval of both the members of the research proposition committee. In the event of a dispute between the two members, the proposal will be referred to the full examination board for a decision.

Upon satisfactory completion of all three examination requirements, the five members of the examination board shall recommend the student for advancement to candidacy for the PhD degree.

Final Examination

This examination is primarily a defense of the candidate's thesis. The examining committee consists of the student's thesis advisor as chair and four other faculty members, at least one of whom is rostered outside of the department. These committee members are selected by the graduate advisor upon request and after consultation with the student. The student must arrange for one of these other committee members to be the "second reader" of the thesis. The second reader will carefully review the thesis with the candidate. The student is responsible for arranging the date of the examination and notifying the graduate program manager at least two weeks prior to the date, and is responsible for distributing copies of the dissertation to the committee members — after it has been approved by the thesis advisor — at least two weeks before the examination. Failure to meet this latter deadline is a legitimate reason for any thesis committee member to postpone the examination.

Course Requirements

General Requirements

Sixty credit hours of courses are required, consisting of 30 hours of research in CHEM 8991, at least 15 hours in formal courses (see next section), and the remainder in other courses, such as summer courses, seminar courses, group meeting courses and research in CHEM 6901.

A minimum grade of B- is required in all courses counting for the PhD degree; students should also be aware that they must maintain a cumulative grade point average of 3.0 in all formal courses and an overall grade point average of 3.0 or they will be placed on academic probation. Students may also be placed on probation if they are not making satisfactory progress in their research. Probationary status must be removed within two semesters or a student will become ineligible to receive a PhD degree from the Department of Chemistry and Biochemistry. Students on probation will not have a high priority for financial support.

A degree plan of courses taken and yet to be taken must be filed with the Graduate School by the end of the student's third semester.

Selection of Formal Courses

All students will be required to take a minimum of 15 credit hours of formal courses. Formal courses are regularly scheduled, examined and graded; courses such as summer courses, seminar courses, group meeting courses and research in CHEM 6901 are not considered formal courses. Each student's program plan for course work must be approved by the student's research advisor and the departmental graduate advisor. These formal courses must be approved prior to the end of the second semester, and students are encouraged to complete formal course requirements within their first three semesters.

Transfer of Credit

Up to 10 credit hours of graduate-level, formal course work may be transferred from another school subject to demonstrated proficiency in the subject(s) and written approval by the graduate advisor. Forms for this purpose can be obtained from the graduate secretary.

Formal Application of Admission for Candidacy for the PhD Degree

All students must make formal application for admission to candidacy for the PhD degree by the end of the third semester on forms that can be obtained from the graduate secretary. This Graduate School requirement should be fulfilled even though students have not completed all their formal course work. After filling in the form indicating graduate courses taken and to be taken, it should be approved and signed by the student's research advisor and then the graduate advisor.

PhD students shall have passed their cumulative exams and the oral comprehensive examination before they may be admitted to candidacy for the PhD degree. Students should note that the approved research proposal must be filed in order for a student to be advanced to candidacy.

Research Requirements

The results of a completed research program are submitted as a thesis for the final examination described above. Some students may pursue their PhD research in a laboratory outside of the department (e.g., JILA, NOAA, etc.) with the approval of the graduate advisor. In this case, the student must find a surrogate advisor in the department who agrees to monitor the activity of the student. It is recommended that meetings

between the surrogate advisor, student and day-to-day advisor be frequent, perhaps in the form of a group meeting.

Time Limit

Students should note the time limit specified in the Graduate School rules: "All doctoral students are expected to complete all degree requirements within six years from the date of the start of course work in the program." Information on extensions is available in the Doctoral Degree Requirements (p. 868) section.

Molecular Biophysics - Graduate Certificate

This program introduces graduate students to the field of biophysics, its methodologies and the state-of-the-art biophysical research efforts being carried out in diverse laboratories and departments on the CU Boulder campus. It creates interdepartmental connections that provide the breadth of training needed to develop biophysical scholars.

Students must be admitted through the regular admissions process to a PhD program in one of the following departments:

- chemical and biological engineering;
- chemistry and biochemistry;
- molecular, cellular and developmental biology; or
- physics

They must satisfy all of their home department's requirements to receive a PhD as well as the additional requirements of the certificate program. For more information, visit the program's Molecular Biophysics Training Program: Certificate Option (<http://www.colorado.edu/biophysics/certificate>) webpage.

Requirements

Participation in one to three laboratory rotations outside the thesis lab, which provide experience with a range of biophysical methods. Subsequently the student joins one of the member laboratories of the training program for thesis work.

Completion of two courses chosen from a list of approved courses. Currently this list includes 15 courses in areas ranging from theoretical physics to molecular and cellular biophysics.

Annual meeting with a faculty advisory committee that provides helpful feedback on the thesis research.

Students are expected to take part in a seminar series, which presents internationally renowned speakers and their research. They also are required to participate in supergroup meetings and symposia, which provide forums for them to present their own research in front of their colleagues and advisory committee.

Classics

The Department of Classics is one of the most vibrant programs in humanistic studies at the University of Colorado. It is a department in which students at every level are challenged to integrate the world of scholarship into their daily lives.

We are multicultural, because we study the civilizations of ancient Greece and Rome, but also the many peoples with which the Greeks and Romans interacted in central and eastern Europe, north Africa, Egypt and the Middle East.

We are interdisciplinary because faculty and students in the department cross the boundaries of literature, philosophy, material culture, history and religion to study the world of antiquity. We also cover area studies because of the historical broad sweep that our field encompasses of the Mediterranean basin and the regions that border it. The department offers courses in language and literature, ancient history, art and archaeology, and philosophy within several programs of study at the undergraduate and graduate levels.

Course codes for this program are CLAS, GREK and LATN.

Master's Degree

- Classics - Master of Arts (MA) (p. 947)

Doctoral Degree

- Classics - Doctor of Philosophy (PhD) (p. 948)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ambrose, Kirk T (https://experts.colorado.edu/display/fisid_115914)
Professor; PhD, University of Michigan Ann Arbor

Atnally, Diane L (https://experts.colorado.edu/display/fisid_113062)
Associate Professor; PhD, University of Michigan Ann Arbor

Bailey, Dominic T. J. (https://experts.colorado.edu/display/fisid_145110)
Associate Professor; PhD, University of Cambridge (England)

Bruce, Scott (https://experts.colorado.edu/display/fisid_122945)
Professor; PhD, Princeton University

Cain, Andrew J (https://experts.colorado.edu/display/fisid_129296)
Associate Professor; PhD, Cornell University

Dusinberre, Elspeth Rogers Mcin (https://experts.colorado.edu/display/fisid_111649)
Professor; PhD, University of Michigan Ann Arbor

Elliott, Jacqueline Michelle (https://experts.colorado.edu/display/fisid_140085)
Associate Professor; PhD, Columbia University In the City of New York

Evjen, Harold D.
Professor Emeritus

Fredricksmeier, Ernst A.
Professor Emeritus

Gibert, John C (https://experts.colorado.edu/display/fisid_101680)
Associate Professor; PhD, Harvard University

Hunt, Peter (https://experts.colorado.edu/display/fisid_115394)
Professor; PhD, Stanford University

James, Sarah Anne (https://experts.colorado.edu/display/fisid_151713)
Assistant Professor; PhD, University of Texas at Austin

King, Joy K.
Professor Emeritus

Kopff, E Christian (https://experts.colorado.edu/display/fisid_100649)
Associate Professor; PhD, University of North Carolina Chapel Hill

Lansford, Edwin Tyler (https://experts.colorado.edu/display/fisid_147620)
Instructor

Lee, Mi-Kyoung (https://experts.colorado.edu/display/fisid_141821)
Associate Professor; PhD, Harvard University

Nakassis, Dimitri (https://experts.colorado.edu/display/fisid_154917)
Professor; PhD, University of Texas at Austin

Newlands, Carole E. (https://experts.colorado.edu/display/fisid_147504)
Professor

Pasnau, Robert C (https://experts.colorado.edu/display/fisid_115293)
Professor; PhD, Cornell University

Reitzammer, Laurialan Blake (https://experts.colorado.edu/display/fisid_145810)
Associate Professor; PhD, University of California-Berkeley

Schütrumpf, Eckart E. W.
Professor Emeritus

Tzavella-Evjen, Terpsichori H.
Professor Emeritus

Courses

CLAS 5021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4021 and HIST 4021

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4031 and HIST 4031

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4041 and HIST 4041 and PHIL 4210

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4061 and HIST 4061 and HIST 5061

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4071 and HIST 4071

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4081 and HIST 4081

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5091 (3) The Roman Empire

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4091 and HIST 4091

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4109 and ARTH 4109 and ARTH 5109

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5110 (3) Greek and Roman Epic

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.
Equivalent - Duplicate Degree Credit Not Granted: CLAS 4110 and HUMN 4110

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5119 (3) Roman Sculpture

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4119 and ARTH 4119 and ARTH 5119

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5120 (3) Greek and Roman Tragedy

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4120 and HUMN 4120

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4129 and ANTH 4129 and ANTH 5129 and ARTH 4129

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5130 (3) Greek and Roman Comedy

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4130 and HUMN 4130

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4139 and ARTH 4139 and ARTH 5139

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5140 (3) The Greek and Roman Novel

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4140 and HUMN 4131

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5149 (3) Greek Cities and Sanctuaries

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4149 and ARTH 4149

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5159 (3) Hellenistic Art and Archaeology

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5159

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture.

Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4169 and ARTH 4169 and ARTH 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5179 (3) City of Athens

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periclean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5179

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5189 (3) City of Rome

Explores in detail the architecture, sculptures, coins, frescoes and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5189

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5199 (3) Roman Architecture

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4199 and ARTH 4199

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5209 (6) Classical Archaeological Field Methods

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4209 and ARTH 4209

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4229 and ARTH 4229 and ARTH 5229

Additional Information: Departmental Category: Art and Archaeology

CLAS 5269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4269 and CLAS 4269 and ARTH 5269

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology
Departmental Category: Asia Content

CLAS 5761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4761 and HIST 4761 and HIST 5761

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5840 (1-3) Graduate Independent Study

No Greek or Latin required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 6109 (3) Topics in Critical Theory and Ancient Art and Archaeology

Topics will vary and may focus on a particular approach to ancient material culture or on a particular time period or artifact category. Emphasis is placed on reading and using theory in considering the ancient world.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 6119 (1-3) Graduate Independent Study in Classical Art and Archaeology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 6952 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Classical Philology

CLAS 7011 (3) Seminar in Ancient History

Examines topics in ancient Greek and Roman history at an advanced seminar level.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 7012 (3) Graduate Seminar

Topic specified in online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Classical Philology

CLAS 7109 (3) Graduate Seminar in Ancient and Classical Art and Archaeology

Topics vary. Emphasis is on gaining expertise in using archaeological reports in tandem with (or contradiction to) textual sources, on reading and using critical theory, on improving analytical skills and discussion, and on honing discussion leadership abilities.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 7840 (1-3) Graduate Independent Study

No Greek or Latin required.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 8992 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Additional Information: Departmental Category: Classical Philology

GREK 5013 (3) Topics in Greek Prose

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

Equivalent - Duplicate Degree Credit Not Granted: GREK 4013

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 5023 (3) Topics in Greek Poetry

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

Equivalent - Duplicate Degree Credit Not Granted: GREK 4023

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 5093 (3) Survey of Greek Literature

Greek literary history in ancient Greek from Homer to the Hellenistic age.

Equivalent - Duplicate Degree Credit Not Granted: GREK 4093

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 6003 (3) Graduate Reading

Author or topic specified in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 6843 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 7013 (3) Graduate Seminar in Greek Literature

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

LATN 5014 (3) Topics in Latin Prose

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

Equivalent - Duplicate Degree Credit Not Granted: LATN 4014

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5024 (3) Latin Prose Composition

Reviews grammar and syntax. Introduces Latin prose style and composition. Formerly CLAS 5024.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4024

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5044 (3) Topics in Latin Poetry

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

Equivalent - Duplicate Degree Credit Not Granted: LATN 4044

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5084 (3) Survey of Roman Literature Part 2: Imperial

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4084

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5094 (3) Survey of Roman Literature Part 1: Republican to Augustan

Introduces Roman literary history from its origins to the 30s BCE.

Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4094

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5404 (3) Special Project: Teaching

Trains students to prepare classroom-ready materials, which are then tested in the students' own classroom. Required of master's candidates (teaching of Latin option). Formerly CLAS 5404.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5824 (3) Latin Teaching Methods: Open Topics

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4824

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 6004 (3) Graduate Reading

Author or topic specified in the online Schedule Planner. Formerly CLAS 6004.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 6844 (1-3) Graduate Independent Study

Formerly CLAS 6844.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 7014 (3) Graduate Seminar in Latin Literature

Formerly CLAS 7014.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

Classics - Master of Arts (MA)

Candidates may choose to emphasize in Greek or Latin, classical art and archaeology, classical antiquity or the teaching of Latin (MAT).

It is expected that students opting for the teaching of Latin either have achieved accreditation at the secondary level or are planning to do so through the School of Education. The MA degree alone does not satisfy the state requirements for certification.

For more information, visit the department's Graduate Degrees in Classics (<http://www.colorado.edu/classics/graduate/graduate-degrees-classics>) webpage.

Concurrent Degree Program BA/MA in Classics

The five-year BA/MA concurrent degree program in classics is designed for students who enter the University of Colorado ready to take courses in Latin or Greek at the 3000-level or above, and who wish to prepare themselves for application to competitive PhD programs in classics. Students without adequate preparation in at least one language would find it difficult to complete two degrees in five years, since proficiency in

the languages comes largely from practice and experience. Students will normally need to study both Latin and Greek in order to meet their course requirements within five years; course offerings in just one language will normally not be sufficient. The five-year degree combines the BA in Greek and/or Latin (Track I) with the MA in classics with concentration in Greek or Latin (Program I), Plan II (no thesis). Students with strong research interests may be able to complete the BA with honors or the MA with concentration in Greek or Latin, Plan I (with thesis). Graduates of the BA/MA program who have completed their work in excellent fashion will be well prepared to apply for PhD programs in classics. Students who enter CU with an already strong knowledge of Latin or Greek may be eligible to pursue a five-year concurrent bachelor's/master's degree (BA/MA).

Here is a guide to the concurrent degree program (<http://www.colorado.edu/classics/bama-guide>); for more information, contact the associate chair for undergraduate studies.

Requirements

Degree Emphases

Latin or Greek Emphasis

Candidates are required to complete at least six graduate-level courses (18 credit hours) in Greek and/or Latin, and to pass a three-hour written examination in translation and analysis of the major language. Students intending to pursue the PhD in classics are strongly advised to develop proficiency in both Latin and Greek, and to acquire a reading knowledge of German and at least one other modern foreign language (normally French or Italian).

Teaching of Latin Emphasis

Candidates must pass a three-hour written examination in Latin translation and a one-hour oral comprehensive examination on teaching methods and their own Latin teaching project. Thirty credit hours of course work, including one Latin workshop (3 credit hours) and a special project (3 credit hours), are required. Plan I is not offered for the MA degree with emphasis on teaching.

Classical Art and Archaeology Emphasis

Candidates are required to complete at least two graduate-level courses (6 credit hours) in Greek and/or Latin and five graduate-level courses (15 credit hours) in ancient and/or medieval art and archaeology. In addition, they must pass written examinations on Greek and Roman art and archaeology. Students intending to pursue the PhD in classical archaeology are strongly recommended to develop proficiency in both Latin and Greek and to acquire a reading knowledge of German and at least one other modern foreign language (normally French or Italian). With the approval of the associate chair for graduate studies, graduate-level classes in Greek or Latin may be substituted for classical archaeology or history.

Classical Antiquity Emphasis

Candidates are required to complete at least two graduate-level courses (6 credit hours) in Greek and/or Latin and must pass a written examination in two of the following fields: history, art and archaeology, religion and mythology, philosophy and political theory and Greek or Latin translation.

Degree Plans

Plan I: Thesis Option

Candidates for the MA plan I (24–27 credit hours of course work at the 5000 level or above, plus 3–6 credit hours of thesis) take a one-hour oral comprehensive examination in defense of the thesis.

Plan II: Comprehensive Examination Option

Candidates for the MA plan II (30 credit hours at the 5000 level or above, without a thesis) must have departmental approval and pass a one-hour oral comprehensive examination covering their course work and reading lists for their exams.

Classics - Doctor of Philosophy (PhD)

The PhD in classical languages and literatures is founded on mastery of Greek and Latin, develops the student's ability to pursue independent scholarly research through seminars and advanced work on special topics, and culminates with the dissertation.

Students take courses and seminars on major ancient authors and genres, Greek and/or Latin prose composition, and such special topics as literary criticism, epigraphy, paleography and numismatics.

In addition to Greek and Latin language and literature, the department has strengths in ancient history and historiography, late Antiquity, philosophy, and Greek and Roman archaeology.

For more information, visit the department's Doctor of Philosophy in Classics (<http://www.colorado.edu/classics/graduate/graduate-degrees-classics/phd>) webpage.

Candidates for the PhD in classics must meet the following requirements:

1. A minimum of 42 credit hours of course work at the 5000 level or above (excluding thesis and accelerated courses). Course work completed in the MA program at the University of Colorado, or up to 21 credit hours of graduate credit transferred from another institution, may be applied toward this requirement. Courses should be distributed as follows:
 - a. Four 7000-level graduate seminars (at least one each in Greek and Latin).
 - b. Two courses in ancient history and/or classical archaeology.
 - c. One course in either Greek or Latin prose composition.
 - d. Two courses in special fields such as epigraphy, law, linguistics, literary theory, medieval studies, palaeography, papyrology, philosophy or religion, as approved by the associate chair for graduate studies.
2. A minimum of 30 credit hours of doctoral dissertation with no more than 10 of these credit hours in any one semester. No more than 10 dissertation credit hours may be taken preceding the semester of taking the oral comprehensive examination. Up to 10 credit hours may be taken during the semester in which the student passes the comprehensive examination.
3. A reading knowledge of German and one other modern foreign language (normally Italian or French). Proficiency is tested by a one-hour written translation test using a dictionary. Students may take a foreign language exam at any time by arrangement with the associate chair for graduate studies. Students are encouraged to pass both modern language exams before the end of the third semester and required to do so before the end of the fourth semester in the PhD program.
4. **Preliminary Examinations in Greek and Latin.** Two written examinations of three hours each, each consisting of two hours of translation and one hour of analysis of texts. The translation portion of each exam will consist of two out of three prose passages and two out of three verse passages for a total of about 100 lines. All passages will be drawn from the PhD reading list. Each written

examination will be followed by a one-hour oral examination that covers the range of Greek or Latin literature represented by the reading list and tests the candidate's general knowledge of the primary sources and literary history. There will be two administrations of each exam per year, in the fall and spring. Students are required to pass both exams by the end of the second semester in the PhD program (or the second semester beyond the MA). Successful completion of the MA in Track I or the equivalent at another university, as determined by the graduate committee, will satisfy one of these examination requirements.

5. **Comprehensive Examination.** Two written examinations of three hours each on two topics or authors, chosen in consultation with faculty members selected by the student and approved by the graduate committee, to be chosen from the following broad areas: language and literature, ancient history, archaeology, philosophy or religion. In selecting the topics for these examinations, students are required to demonstrate balance in the fields of Greek and Roman culture, as determined by the graduate committee. The written comprehensive examinations will be administered twice per year, typically during the last two weeks of the term. Successful completion of the written examination is followed by a two-hour oral exam on Greek and Roman culture within the area of the student's chosen specialization, which should coincide with the student's intended dissertation topic. Students are required to complete these exams by the end of their fourth semester in the PhD program.
6. **Dissertation Prospectus.** To be circulated to the dissertation advisory committee for approval by the end of the fifth semester in the PhD program.
7. **Dissertation.** To be completed by the end of the eighth semester in the PhD program.
8. **Final Examination (upon submission of dissertation).** Two hours of oral defense of the dissertation.

Cognitive Science

Cognitive Science is the study of human knowledge, of which one aspect is the study of how knowledge is acquired, stored, and represented in the mind, including the mind's underlying biological mechanisms. Another aspect of Cognitive Science concerns how knowledge is understood, remembered, communicated, and used in the performance of activities, including the acquisition and application of skills and information. This latter aspect provides the practical applications of cognitive science, and thereby ensures a demand for graduates in both academic and industrial markets. Training for graduates in cognitive science prepares students admirably for many of the fields that are targeted as the major growth fields of the 21st century: telecommunications, information processing, medical analysis, data retrieval, education, and multimedia services.

The Institute of Cognitive Science (ICS) currently offers two graduate certificate programs: one has a general science focus, the other focuses on human language technology. The cognitive science academic certificate programs are interdisciplinary programs for graduate students in the following departments (see the undergraduate Cognitive Science (p. 244) page for certification at the undergraduate level):

- Psychology & Neuroscience
- Philosophy
- Linguistics
- Education
- Speech, Language and Hearing Sciences

- Computer Science
- Architecture, Planning and Design (Denver Campus)
- Information Science
- Integrative Physiology

For more information, visit the Institute of Cognitive Science (<https://www.colorado.edu/ics/graduate-programs>) website or call Donna Caccamise at 303-735-3602.

Doctoral Degree

- Cognitive Science - Doctor of Philosophy (PhD) (p. 950)

Certificates

- Cognitive Science - Graduate Certificate (p. 951)
- Human Language Technology - Graduate Certificate (p. 952)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Banich, Marie (https://experts.colorado.edu/display/fisid_120646)
Professor; PhD, University of Chicago

Bidwell Kovalev, Lorna Cinnamon (https://experts.colorado.edu/display/fisid_155117)
Asst Research Professor; PhD, University of Colorado Boulder

Carter Carston, Ronald McKell (https://experts.colorado.edu/display/fisid_154921)
Assistant Professor; PhD, California Institute of Technology

Cordes, Dietmar (https://experts.colorado.edu/display/fisid_155229)
Assoc Professor Adjunct

Eisenberg, Michael A (https://experts.colorado.edu/display/fisid_100427)
Professor; PhD, Massachusetts Institute of Technology

Kim, Albert E. (https://experts.colorado.edu/display/fisid_143740)
Associate Professor; PhD, University of Pennsylvania

Martin, James H (https://experts.colorado.edu/display/fisid_100495)
Professor; PhD, University of California-Berkeley

Mozer, Michael C (https://experts.colorado.edu/display/fisid_105922)
Professor; PhD, University of California-San Diego

Sumner, Tammy R (https://experts.colorado.edu/display/fisid_105742)
Professor; PhD, University of Colorado Boulder

Van Vuuren, Sarel (https://experts.colorado.edu/display/fisid_124159)
Assoc Research Professor; PhD, Oregon Graduate Institute of Science Technology

Wager, Tor Dessart (https://experts.colorado.edu/display/fisid_147666)
Professor; PhD, University of Michigan Ann Arbor

Ward, Wayne Hinson (https://experts.colorado.edu/display/fisid_114680)
Research Professor; PhD, University of Colorado Boulder

Yaeger, Barbara Jean (https://experts.colorado.edu/display/fisid_151792)
Asst Research Professor; PhD, Oakland University

Cognitive Science - Doctor of Philosophy (PhD)

The cognitive science academic program includes a combined PhD degree between cognitive science and a core discipline, as well as a combined PhD plan of study tailored for students interested in cognitive neuroscience. These programs are administered by CU Boulder's Institute of Cognitive Science (ICS).

Graduate students in cognitive science are admitted to graduate programs in participating departments that have cognitive science faculty, and must meet the requirements for admission and degree completion in their home department.

Students wishing to attain a degree or certificate in cognitive science must formally apply to the director of academic programs of ICS. To be admitted, they must be a student affiliate of ICS, which requires being a graduate student in good standing in a member department, and they must be sponsored by an ICS faculty fellow. Students who enter the Graduate School without a master's degree may be admitted to the program upon completion of their first year of study; students with a master's degree may be admitted during their first year.

The degree and certificate programs in cognitive science require students to demonstrate acceptable performance in interdisciplinary course work and courses outside their home department. The courses must be offered by the following departments: Computer Science; Education; Integrative Physiology; Linguistics; Philosophy; Information Science; Psychology and Neuroscience; Speech, Language, Hearing Sciences; Architecture and Planning; or a department in which there is an ICS faculty fellow.

Details about requirements for the degree and certificate programs can be obtained through the director of academic programs for ICS or by contacting the ICS main office.

For further information, contact:

Donna Caccamise
Associate Director and Academic Program Director
Institute of Cognitive Science
Donna.Caccamise@Colorado.edu

Dual Degree Program Cognitive Science Combined PhD

Graduate students in good standing in one of the following participating academic units may apply to earn a combined PhD with cognitive science:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language, and Hearing Sciences
- Education
- Integrative Physiology
- Architecture and Planning
- Information Science

Earning such a degree can significantly enhance a student's academic knowledge and career choices. Review the course requirements,

application for admission and program completion checklist for further information.

For more information, visit the institute's Cognitive Science Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-science-combined-phd>) webpage.

Triple Degree Program Cognitive Neuroscience Combined PhD

Graduate students in good standing in one of the following participating academic units may apply to earn a combined PhD with cognitive science, neuroscience and their core discipline:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language and Hearing Sciences
- Education
- Architecture and Planning

Students interested in the combined PhD with cognitive science and neuroscience must meet course and thesis requirements. The student's thesis advisor must be a participating faculty member of the cognitive neuroscience faculty. To enroll in this triple degree, you must enroll in the neuroscience program and the cognitive science program.

For more information, visit the institute's Cognitive Neuroscience Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-neuroscience-combined-phd>) webpage.

Requirements Combined PhD Requirements

Students must complete 30 credit hours of cognitive science courses, including 9 credit hours of required core courses and 21 credit hours of elective courses.

For more program information, visit the institute's Cognitive Science Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-science-combined-phd>) webpage.

Required Courses and Semester Credit Hours

Core Cognitive Science Courses

PSYC 6200/ CSCI 6402/ EDUC 6504/ LING 6200/ PHIL 6310	Issues and Methods in Cognitive Science	3
PSYC/LING 7775/CSCI 7772/ EDUC 7775/SLHS 7775/PHIL 7810	Topics in Cognitive Science (two semesters, 1 credit per semester)	2
PSYC 7415/ CSCI 7412/ EDUC 6506/ LING 7415/PHIL 7415	Cognitive Science Research Practicum	2

PSYC 7425/ Cognitive Science Research Practicum 2
 CSCI 7422/
 EDUC 6516/
 LING 7425/PHIL
 7425

Elective Cognitive Science Courses	
Twelve credit hours of courses outside the home department, including courses in at least two different departments outside the home department. Each course must be at least 2 credits.	12
Two interdisciplinary courses from the list of ICS-approved interdisciplinary courses during the semester the course was taken.	6
Additional elective courses to complete the 30-credit-hour requirement.	3
Total Credit Hours	30

For a list of available elective courses, visit the institute’s Course Catalog (<http://www.colorado.edu/ics/graduate-programs/course-catalog>) webpage.

Interdisciplinary Thesis

The original contributions of the dissertation research should exploit state-of-the-art methods from the perspective of at least two disciplines. Students are encouraged to have their doctoral research co-supervised by two ICS fellows representing different disciplines.

Dissertation

Students must complete 30 hours of dissertation research.

Triple PhD Requirements

Students must complete 28–34 credit hours, including 11–14 credit hours of required core courses, 6–9 credit hours of depth courses and at least 11 credit hours of courses in a related discipline specialization. For a list of specific available courses, visit the institute’s Course Catalog (<http://www.colorado.edu/ics/graduate-programs/course-catalog>) webpage.

For more information, visit the institute’s Cognitive Neuroscience Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-neuroscience-combined-phd>) webpage.

Comprehensive Examination

In accordance with the graduate school requirements, students will be required to take a comprehensive exam, which they must pass in order to advance to doctoral candidacy status. Successful completion (grade of B- or better) of the Introduction to Neuroscience I (NRSC 5100) and Introduction to Neuroscience II (NRSC 5110) courses will fulfill the neuroscience component of the comprehensive exam.

In addition, the student must pass a comprehensive exam in their area of specialization. The format of this specialty comprehensive exam will be determined by the student’s advisor and will be appropriate for the advisor’s department/program of affiliation, but must also be interdisciplinary in nature to fulfill the cognitive science component of the comprehensive exam.

Thesis

All cognitive neuroscience PhD students will be required to complete a doctoral thesis with a primary cognitive neuroscience focus. The thesis/dissertation will represent original state-of-the art research of quality suitable for publication in a reputable scientific journal. The student’s thesis advisor must be a participating faculty member of the cognitive neuroscience faculty. In addition, the student’s thesis committee must

include at least one additional neuroscience faculty member and one cognitive science faculty member from outside the student’s area of specialization. In accordance with the requirements of the Graduate School, the student’s committee must be comprised of a minimum of five faculty members that have graduate faculty appointments. The committee will be formed by the student’s advisor, upon approval of the slate of members by the academic directors of the neuroscience and cognitive science combined PhD programs.

Cognitive Science - Graduate Certificate

Tailored to the individual student’s area of interest, the cognitive science curriculum for this certificate is designed to provide broad as well as in-depth training in the cognitive sciences.

Graduate students in good standing in one of the following participating academic units may apply to earn a graduate certificate in cognitive science:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language, and Hearing Sciences
- Education
- Integrative Physiology
- Architecture and Planning
- Information Science

Earning such a certificate can significantly enhance a student’s academic knowledge and career choices.

To learn more about the certificate, visit the ICS website (<https://www.colorado.edu/ics/graduate-programs/cognitive-science-graduate-certificate>).

Requirements

The graduate certificate consists of course requirements only.

Required Courses and Credit Hours

Required Courses		
PSYC 6200/ CSCI 6402/ EDUC 6504/ LING 6200/ PHIL 6310	Issues and Methods in Cognitive Science	3
PSYC/LING 7775/CSCI 7772/ EDUC 7775/SLHS 7775/PHIL 7810	Topics in Cognitive Science (2 semesters, 1 credit per semester)	2

Electives	
Three cognitive science courses of 2 credit hours or more	6
One interdisciplinary course	2-3
Additional courses to complete the credit-hour requirement from at least two different departments outside of the student’s home department	

To learn more about the program, visit the ICS website (<https://www.colorado.edu/ics/graduate-programs/cognitive-science-graduate-certificate>).

Human Language Technology - Graduate Certificate

The explosive growth of the web and the vast improvements in computing power in the last decade have led to a strong need for education and research in human language technology. Human language technology is an interdisciplinary field that includes the following key technological and scientific areas:

- Computer Speech Recognition and Understanding
- Natural Language Understanding and Generation
- Text-based Information Retrieval
- Web-Based Dialog Agents

CU Boulder's interdisciplinary certificate in human language technology, offered jointly by the Institute of Cognitive Science; the Department of Computer Science; the Department of Linguistics; and the Department of Speech, Language, and Hearing Sciences, provides a rich and broad background for students interested in computational tools for human language processing.

To learn more about the certificate, visit the Institute of Cognitive Science's website (<https://www.colorado.edu/ics/graduate-programs/human-language-technology-certificate>).

Curriculum

The curriculum for the certificate consists of **five** different courses:

- **One** semester of programming (CSCI 1300) (waived for those with programming background).
- **Three** courses from the core list; at least two of these three must be outside the student's home department and college.
- **One** course from the optional course list (or two from the optional list if programming was waived). Extra courses from the core list (beyond the required three) can also be counted as optional courses.

Three of these five required courses must be taken at the graduate level.

For a list of core and optional courses, visit the ICS website (<https://www.colorado.edu/ics/graduate-programs/human-language-technology-certificate>).

Ecology and Evolutionary Biology

The EBIO graduate program provides advanced training in a wide variety of biological disciplines ranging from biogeochemistry to community ecology to evolutionary genetics. The goal of the EBIO graduate program is to produce scientists, educators and citizens who are equipped with skills to build careers that advance knowledge about life on Earth. Graduates of the EBIO program are well-positioned to pursue a wide range of careers that include academia, science education, wildlife biology, conservation biology, resource management, environmental consulting and environmental law.

Our disciplinary strengths include behavior, ecology, genetics, morphology and systematics. Roughly half of the faculty focus on the adaptation and functioning of organisms in the context of environment, while the other half study higher levels of organization, including

populations, communities and ecosystems. Our research programs have relevance for global change, conservation biology, and revealing fundamental mechanisms underlying the structural and functional adaptations of organisms.

Please contact ebiograd@colorado.edu for additional information.

Course code for this program is EBIO.

Master's Degree

- Ecology and Evolutionary Biology - Master of Arts (MA) (p. 956)

Doctoral Degree

- Ecology and Evolutionary Biology - Doctor of Philosophy (PhD) (p. 957)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, William (https://experts.colorado.edu/display/fisid_103612)
Professor; PhD, Australian National Univ (Australia)

Armstrong, David M.
Professor Emeritus

Barger, Nichole Nannette (https://experts.colorado.edu/display/fisid_131398)
Associate Professor; PhD, Colorado State University

Basey, John M (https://experts.colorado.edu/display/fisid_105539)
Senior Instructor; PhD, University of Nevada-Reno

Bekoff, Marc
Professor Emeritus

Bock, Carl L E.
Professor Emeritus

Bock, Jane H.
Professor Emeritus

Bonde, Erik K.
Professor Emeritus

Bowers, M Deane (https://experts.colorado.edu/display/fisid_101746)
Professor; PhD, University of Massachusetts at Amherst

Bowman, William D (https://experts.colorado.edu/display/fisid_105191)
Professor; PhD, Duke University

Breed, Michael D (https://experts.colorado.edu/display/fisid_103631)
Professor; PhD, University of Kansas

Carpenter, J Harrison (https://experts.colorado.edu/display/fisid_115915)
Senior Instructor; MS, Michigan Technological University

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Crumpacker, David W.
Professor Emeritus

Cruz, Alexander (https://experts.colorado.edu/display/fisid_100402)
Professor; PhD, University of Florida

Cundiff, Milford F (https://experts.colorado.edu/display/fisid_105396)
Associate Professor; PhD, University of Colorado Boulder

Davies, Kendi F (https://experts.colorado.edu/display/fisid_142304)
Associate Professor; PhD, Australian National Univ (Australia)

Demmig-Adams, Barbara (https://experts.colorado.edu/display/fisid_105649)
Professor; Dr habil, Univ of Wurzburg (Germany)

Emery, Nancy Christine (https://experts.colorado.edu/display/fisid_156291)
Assistant Professor; PhD, University of California-Davis

Fierer, Noah (https://experts.colorado.edu/display/fisid_142240)
Associate Professor; PhD, University of California-Santa Barbara

Flaxman, Samuel M (https://experts.colorado.edu/display/fisid_145698)
Associate Professor; PhD, Cornell University

Johnson, Pieter T J (https://experts.colorado.edu/display/fisid_143590)
Associate Professor; PhD, University of Wisconsin-Madison

Kane, Nolan Coburn (https://experts.colorado.edu/display/fisid_151238)
Assistant Professor; PhD, Indiana University Bloomington

Kocielek, John Patrick (https://experts.colorado.edu/display/fisid_145728)
Professor; PhD, University of Michigan Ann Arbor

Lewis, William M (https://experts.colorado.edu/display/fisid_102314)
Professor; PhD, Indiana University Bloomington

Linhart, Yan B.
Professor Emeritus

Lynch, Carol B.
Professor Emeritus

Martin, Andrew (https://experts.colorado.edu/display/fisid_113238)
Professor; PhD, University of Hawaii at Manoa

Mayer, Stephanie Susan (https://experts.colorado.edu/display/fisid_114948)
Senior Instructor

McCain, Christy (https://experts.colorado.edu/display/fisid_145010)
Associate Professor; PhD, University of Kansas

McKenzie, Valerie J (https://experts.colorado.edu/display/fisid_142951)
Assistant Professor; PhD, University of California-Santa Barbara

Medeiros, Daniel Meulemans (https://experts.colorado.edu/display/fisid_145697)
Associate Professor; PhD, California Institute of Technology

Melbourne, Brett Andrew (https://experts.colorado.edu/display/fisid_144966)
Associate Professor; PhD, Australian National Univ (Australia)

Mitton, Jeffrey B (https://experts.colorado.edu/display/fisid_101058)
Professor; PhD, SUNY at Stony Brook

Monson, Russell K.
Professor Emeritus

Nichols, Harvey
Professor Emeritus

Safran, Rebecca J (https://experts.colorado.edu/display/fisid_145518)
Associate Professor; PhD, Cornell University

Schmidt, Steve (https://experts.colorado.edu/display/fisid_103713)
Professor; PhD, Cornell University

Seastedt, Timothy (https://experts.colorado.edu/display/fisid_103519)
Professor; PhD, University of Georgia

Smith, Stacey Dewitt (https://experts.colorado.edu/display/fisid_153407)
Assistant Professor; PhD, University of Wisconsin-Madison

Stock, David W (https://experts.colorado.edu/display/fisid_113762)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Suding, Katharine Nash (https://experts.colorado.edu/display/fisid_116718)
Professor; PhD, University of Michigan Ann Arbor

Townsend, Alan Ronald (https://experts.colorado.edu/display/fisid_107584)
Professor; PhD, Stanford University

Tripp, Erin Anne (https://experts.colorado.edu/display/fisid_152313)
Assistant Professor; PhD, Duke University

Wessman, Carol A (https://experts.colorado.edu/display/fisid_100909)
Professor; PhD, University of Wisconsin-Madison

Windell, John T.
Professor Emeritus

Winston, Paul W.
Professor Emeritus

Courses

EBIO 5000 (1) EBIO Colloquia

All first year EBIO graduate students are required to attend the EBIO Colloquia Series. Speakers from around the world and within the department cover topics in all areas of biology.

Repeatable: Repeatable for up to 2.00 total credit hours.

EBIO 5030 (3) Limnology

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4030

Requisites: Restricted to graduate students only.

EBIO 5060 (3) Landscape Ecology

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4060

Requisites: Restricted to graduate students only.

EBIO 5080 (4) Freshwater Phycology

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4080

Requisites: Restricted to graduate students only.

EBIO 5100 (3) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4100

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 5120 (2-4) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 5150 (1-2) Techniques in Ecology

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4150

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 5240 (3) Advanced Topics in Animal Behavior

Covers special areas of ethology such as sociobiology, animal communication, cognitive ethology, human ethology, moral and ethical issues.

Recommended: Prerequisite EBIO 3240.

EBIO 5270 (3) Population Genetics

Provides an in-depth introduction to population genetics. Lectures and discussions will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. Following an introduction to population genetic theory, we will investigate current topics in the field.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4270

Grading Basis: Letter Grade

EBIO 5290 (4) Phylogenetics and Comparative Biology

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4290

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

EBIO 5320 (3) Current Topics in Evolutionary Biology

Examines six major themes on contemporary evolutionary research: population genetics, natural selection and adaptation, molecular evolution, evolution and development, phylogenetic systematics, and macroevolution. Emphasizes recent primary literature and sophisticated mastery.

Requisites: Restricted to graduate students only.

EBIO 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4340 and ENVS 4340 and ENVS 5340

Recommended: Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

EBIO 5410 (4) Biometry

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4410

Requisites: Restricted to graduate students only.

EBIO 5420 (3) Computational Biology

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4420

Grading Basis: Letter Grade

EBIO 5440 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4440 and MCDB 4441 and MCDB 5441

Requisites: Restricted to graduate students only.

EBIO 5460 (1-5) Special Topics

Familiarizes students with specialized areas of biology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4460

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 5520 (4) Plant Systematics

Explores principles and techniques in modern plant systematics from lichens and non-vascular plants to lycophytes, ferns, gymnosperms and angiosperms. Framework is evolutionary and ecological, with emphasis on taxonomy of major lineages and families of plants. No prerequisites, but coursework in evolutionary biology, genetics, phylogenetics and/or other botany classes is strongly encouraged.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4520

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

EBIO 5570 (3) Advanced Plant Physiology

Evaluates critically various concepts underlying the functioning of plants, including current controversial topics. Emphasizes the responses of plants to various environmental factors.

EBIO 5600 (4) Evolutionary Ecology

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4600

Grading Basis: Letter Grade

EBIO 5660 (4) Insect Biology

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4660

Requisites: Restricted to graduate students only.

EBIO 5740 (3) Biology of Amphibians and Reptiles

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4740

EBIO 5750 (4) Ornithology

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4750

EBIO 5760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4760 and MUSM 5760

Requisites: Restricted to graduate students only.

EBIO 5800 (3) Critical Thinking in Biology

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4800

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite minimum of 14 hours of EBIO course work.

EBIO 5820 (1) Graduate Writing Seminar

Enhances writing proficiency, using graduate writing projects to implement the course concepts. Offers understanding of conventions and strategies used in scientific writing to prepare students for academic and professional communication. Department enforced requisite, basic proficiency in English as a written language.

Requisites: Restricted to graduate students only.

EBIO 5840 (1-6) Independent Study (Master's Level)

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6000 (1) Seminar: Introduction to Biological Research

Discusses areas of biological research represented in EBIO. Required of all first-year graduate students in EBIO.

Requisites: Restricted to graduate students only.

EBIO 6100 (1-3) Seminar in Environmental Biology

Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6120 (1-3) Seminar in Environmental Biology

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6100

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 6200 (1-3) Seminar in Population Biology

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6210

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6210 (1-3) Seminar in Population Biology

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6200

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 6300 (1-3) Seminar in Organismic Biology

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6440 (2) Remote Sensing Field Methods

Explores theory and practical field measurements for validation of airborne and spaceborne spectral image acquisition. Emphasizes radiative scattering properties of soil, vegetation, cryosphere, and atmosphere. Characterization and calibration of instrumentation used to measure these properties.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 6443

Requisites: Requires a prerequisite course of GEOL 4093 or GEOL 5093 (minimum grade D-).

Recommended: Prerequisite GEOL 5240.

EBIO 6840 (1-7) Independent Research (Master's Level)

Instructor consent required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6940 (1) Master's Degree Candidate - Plan II

Instructor consent required.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

EBIO 6950 (1-6) Master's Thesis

Instructor consent required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 7840 (1-6) Independent Study (Doctoral Level)

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 8840 (1-6) Independent Research (Doctoral Level)

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 8990 (1-10) Doctoral Dissertation

Instructor consent required.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Ecology and Evolutionary Biology - Master of Arts (MA)

The EBIO department offers programs leading to the Master of Arts (MA) degree in a wide variety of biological disciplines, ranging from biogeochemistry to community ecology to evolutionary genetics and others. Modern laboratory facilities for graduate study are located in the Ramaley building. In addition, the department has strong ties with the University Museum, the Institute of Arctic and Alpine Research (INSTAAR), the Institute of Behavioral Genetics (IBG), the Cooperative Institute for Research in Environmental Sciences (CIRES), the Environmental Studies Program (ENVS) and the Departments of Integrative Physiology, Geology, Geography, Anthropology and Molecular, Cellular and Developmental Biology. INSTAAR operates the Mountain Research Station, an alpine field laboratory 25 miles from campus. Graduate student support is available in the form of fellowships, part-time instructorships, teaching assistantships, research assistantships and research grants.

Admission information is provided on the EBIO website (<http://www.colorado.edu/ebio/graduate/ma-phd-programs/#MASTERS>). Foreign applications are due by Dec. 1, and U.S. domestic applications by Dec. 31 for consideration for admission during the subsequent academic year. A completed domestic application includes a statement of intent, three letters of recommendation, official transcripts and scores on the GRE General Test. Applicants are encouraged to communicate with potential faculty sponsors well before the application deadline. Applications for spring semester admission are not accepted. Students are required to have a bachelor's degree in biology or an equivalent.

Concurrent Degree Program

BA/MA in Ecology and Evolutionary Biology

A combined bachelor's (BA) and master's (MA) degree with thesis is offered for highly motivated undergraduate students. The BA/MA program allows students to take advanced courses at an accelerated pace, engage in an independent research project and obtain both degrees in five years. In addition to preparing graduates for additional graduate study or medical school, the program is expected to position them for employment in areas such as environmental consulting, teaching at the high school or community college level or by businesses with an environmental or biomedical emphasis. Applications from sophomores and juniors for the BA/MA degree are considered on a competitive basis. Applicants must have an overall GPA of 3.00 or higher in the EBIO major and the support of a faculty research advisor. Applications are available from the EBIO graduate coordinator, and are due on Oct. 15 and March 15.

Candidates for this degree must complete all college core requirements by the end of the senior year. To be awarded both BA and MA degrees, a student must maintain a GPA of 3.00 or better and complete at least 144 credit hours. The BA/MA program requires 24 hours of graduate credit at the 5000 level or above, and 4–6 hours of thesis credit. In addition to writing a thesis based on original research, students are examined by their thesis committee in the fifth year on general knowledge in ecology and/or evolutionary biology. The final examination consists of a defense of the thesis before the committee; it should be scheduled by the end of the fifth year.

Students interested in this program are encouraged to consult with the EBIO associate chair for graduate studies early in their undergraduate career. No financial support is available from the department for students enrolled in this program.

Requirements

Degree Plans

Plan I: Thesis Option

The EBIO MA I program (with thesis) is intended to be a two year course of study that prepares students for admission to PhD programs, teaching positions or a variety of forms of employment as professional biologists. MA I students' studies are focused on a research project culminating in a thesis. Prospective students are urged to consult with faculty advisors to determine whether application for the MA I or PhD program is more appropriate. Applications for the MA I program are considered on a competitive basis; the department only admits students for whom financial support is available. Thirty credit hours of course work are required for the degree, at least 24 of which must be at the 5000 level or above, including 4–6 hours of thesis credit. The thesis topic is presented to the thesis committee as a written research proposal in the second semester of the program, and the committee administers in the third semester an examination on general knowledge in ecology and/or evolutionary biology. The final examination consists of the thesis defense, which should be scheduled during the second year for full-time students.

Plan II: Non-Thesis Option

A non-thesis master's degree is offered through the EBIO department's MA II program for students interested in furthering their knowledge of ecology and/or evolutionary biology but not in graduate training beyond the MA. This program is suitable for secondary school teachers and others whose career choices do not require a research thesis. Applicants are required to attain sponsorship from a faculty member prior to submitting application materials. Applicants are considered

on a competitive basis; financial support is not guaranteed for MA II students. Thirty credit hours of course work are required for the degree, at least 24 of which must be at the 5000 level or above, including 4 credit hours of independent research leading to a paper to be presented to the faculty sponsor. An examination on general knowledge in ecology and/or evolutionary biology is administered by the advisory committee in the third semester, and this committee may also require a final oral examination.

Ecology and Evolutionary Biology - Doctor of Philosophy (PhD)

The EBIO department offers a doctor of philosophy (PhD) degree in a wide variety of biological disciplines, ranging from biogeochemistry to community ecology to evolutionary genetics and others.

The PhD is a research degree, involving the production of a major piece of original research (the dissertation). The program is intended to be a five-year course of study that produces graduates who subsequently teach and conduct research at colleges or universities or hold research or leadership positions at other private or government institutions

Students are expected to form a dissertation committee of five faculty members (including one from outside EBIO) after beginning their studies. This committee aids the student in designing a research program and choosing relevant course work. In addition to the final examination upon completion of the dissertation, the dissertation committee administers an examination (typically in the third semester) on general knowledge in ecology and/or evolutionary biology and a comprehensive examination (typically in the fifth semester) on a written research proposal submitted by the student.

Modern laboratory facilities for graduate study are located in the Ramaley Biology building. In addition, the department has strong ties with the University Museum, the Institute of Arctic and Alpine Research (INSTAAR), the Institute of Behavioral Genetics (IBG), the Cooperative Institute for Research in Environmental Sciences (CIRES), the Environmental Studies Program (ENVS) and the departments of Integrative Physiology, Geology, Geography, Anthropology and Molecular, Cellular and Developmental Biology. INSTAAR operates the Mountain Research Station, an alpine field laboratory 25 miles from campus. Graduate student support is available in the form of fellowships, part-time instructorships, teaching assistantships, research assistantships and research grants.

Requirements

Admissions

Foreign applications are due by Dec. 1, and U.S. domestic applications are due by Dec. 31 for consideration for admission during the subsequent academic year. A completed domestic application includes a statement of intent, three letters of recommendation, official transcripts and scores on the GRE General Test.

Applicants are encouraged to communicate with potential faculty sponsors well before the application deadline. Applications are considered on a competitive basis and academic-year stipends (teaching or research assistantships) are provided to students in good standing. Applications for spring semester admission are not accepted. Students are required to have a bachelor's degree in biology or an equivalent.

For more information, visit the department's Admissions (<http://www.colorado.edu/ebio/graduate/admissions>) webpage.

Course Requirements

A total of 30 credit hours of course work must be taken, although independent study credit may be included in this total. In addition, a total of 30 credit hours of dissertation must also be taken. PhD students are required to teach for at least one academic year, typically as a teaching assistant for one of the many laboratory courses offered by the department.

Economics

Our PhD program focuses on a solid core curriculum in economic theory and econometrics. Beyond this, we offer a number of specialized fields of study: econometrics, economic development, economic history, industrial organization, international trade and finance, labor and human resources, natural resources and environmental economics and public economics.

Course code for this program is ECON.

Master's Degree in Economics

The Department of Economics does not currently offer a stand-alone MA degree program, although students enrolled in our PhD program will earn their MA degree as they progress toward their doctorate.

Doctoral Degree

- Economics - Doctor of Philosophy (PhD) (p. 961)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Antman, Francisca Marie (https://experts.colorado.edu/display/fisid_144606)
Associate Professor; PhD, Stanford University

Baranov, Oleg Valeryevich (https://experts.colorado.edu/display/fisid_149617)
Assistant Professor; PhD, University of Maryland College Park Campus

Barham, Tania C.J. (https://experts.colorado.edu/display/fisid_140077)
Associate Professor; PhD, University of California-Berkeley

Boileau, Martin (https://experts.colorado.edu/display/fisid_113872)
Professor; PhD, Queen's Univ, Kingston (Canada)

Burr, Chrystie (https://experts.colorado.edu/display/fisid_152969)
Assistant Professor; PhD, University of Arizona

Cadena, Brian C (https://experts.colorado.edu/display/fisid_145740)
Associate Professor; PhD, University of Michigan Ann Arbor

Carballo, Jeronimo Rafael (https://experts.colorado.edu/display/fisid_155949)
Assistant Professor; PhD, University of Maryland College Park Campus

Carlos, Ann M (https://experts.colorado.edu/display/fisid_105534)
Professor; PhD, Univ of Western Ontario (Canada)

Chen, Yongmin (https://experts.colorado.edu/display/fisid_108989)
Professor; PhD, Boston University

De Bartolome, Charles A M (https://experts.colorado.edu/display/fisid_101302)
Professor; PhD, University of Pennsylvania

Flores, Nicholas E (https://experts.colorado.edu/display/fisid_107603)
Professor; PhD, University of California-San Diego

Glahe, Fred R.
Professor Emeritus

Graves, Philip E (https://experts.colorado.edu/display/fisid_102050)
Professor; MA, Northwestern University

Greenwood, Michael J.
Professor Emeritus

Howe, Charles W.
Professor Emeritus

Hsiao, Frank S. T.
Professor Emeritus

Hughes, Jonathan Edward (https://experts.colorado.edu/display/fisid_147335)
Assistant Professor; PhD, University of California-Davis

Iyigun, Fevzi Murat (https://experts.colorado.edu/display/fisid_118373)
Professor; PhD, Brown University

Jobin, Nicole V (https://experts.colorado.edu/display/fisid_103920)
Instructor; PhD, University of Colorado Boulder

Kaempfer, William H (https://experts.colorado.edu/display/fisid_102376)
Professor; PhD, Duke University

Kaffine, Daniel Thomas (https://experts.colorado.edu/display/fisid_153280)
Associate Professor; PhD, University of California-Santa Barbara

Kaplan, Jules Gordon (https://experts.colorado.edu/display/fisid_106077)
Instructor; PhD, University of Colorado Boulder

Keller, Wolfgang (https://experts.colorado.edu/display/fisid_141891)
Professor; PhD, Yale University

Kim, Jin-Hyuk (https://experts.colorado.edu/display/fisid_149615)
Assistant Professor; PhD, Cornell University

Lillydahl, Jane
Professor Emeritus

Liu, Xiaodong (https://experts.colorado.edu/display/fisid_144508)
Associate Professor; PhD, Ohio State University

Markusen, James R (https://experts.colorado.edu/display/fisid_103187)
Distinguished Professor; PhD, Boston College

Martins-Filho, Carlos B (https://experts.colorado.edu/display/fisid_147510)
Professor; PhD, University of Tennessee-Knoxville

Maskus, Keith E (https://experts.colorado.edu/display/fisid_103414)
Professor; PhD, University of Michigan Ann Arbor

McKinnish-Harllie, Terra Greenw (https://experts.colorado.edu/display/fisid_115558)
Professor; PhD, Carnegie Mellon University

Mertens, William G (https://experts.colorado.edu/display/fisid_105762)
Instructor; PhD, University of Colorado Boulder

Morey, Edward R (https://experts.colorado.edu/display/fisid_102256)
Professor; PhD, Univ of British Columbia (Canada)

Owen, Wyn F.
Professor Emeritus

Poulson, Barry
Professor Emeritus

Rondina, Giacomo (https://experts.colorado.edu/display/fisid_154419)
Assistant Professor; PhD, University of Wisconsin-Madison

Roper, Don E.
Professor Emeritus

Savage, Scott James (https://experts.colorado.edu/display/fisid_121239)
Associate Professor; PhD, Curtin Univ of Tech (Western Australia)

Shiue, Carol Hua (https://experts.colorado.edu/display/fisid_141892)
Associate Professor; PhD, Yale University

Singell, Larry D.
Professor Emeritus

Udis, Bernard
Professor Emeritus

Waldman, Donald M (https://experts.colorado.edu/display/fisid_100468)
Professor; PhD, University of Wisconsin-Madison

Zax, Jeffrey S (https://experts.colorado.edu/display/fisid_100898)
Professor; PhD, Harvard University

Zhang, Shuang (https://experts.colorado.edu/display/fisid_151517)
Assistant Professor; PhD, Cornell University

Courses

ECON 7010 (3) Microeconomic Theory 1

Analyzes recent and contemporary literature on fundamentals of economic theory. Considers value theory with particular emphasis on methodology, theory of demand, theory of the firm, game theory, theory of distribution, general equilibrium theory, and welfare economics. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7020 (3) Macroeconomic Theory 1

Discusses behavior of consumption, investment, employment, production, and interest rates in the context of dynamic optimization models. Also considers government, economic growth, and business cycles. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7030 (3) Microeconomic Theory 2

Continuation of ECON 7010. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7040 (3) Macroeconomic Theory 2

Presents the theoretical and empirical application of dynamic macro programming models. Topics include consumption, investment, labor, money, and credit theories. Covers the theory of economic fluctuations and business cycles employing dynamic general equilibrium models. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7050 (3) Advanced Economic Theory

Discusses advanced topics in game theory and general equilibrium. Department enforced prerequisites: ECON 7010 and ECON 7030 and ECON 7818 and ECON 7828.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7818 (3) Mathematical Statistics for Economists

Provides the mathematical foundation for Ph.D. level statistical inference in economic research. The primary topics of the course are probability theory and mathematical statistics including hypothesis testing and classical estimation with an emphasis on the method of maximum likelihood. Instructor consent required.

Additional Information: Departmental Category: Quantitative Economics

ECON 7828 (3) Econometrics

Continuation of ECON 7818. Topics include regression analysis and extensions of the linear regression model to generalized least squares, time series data, and systems of equations. Instructor consent required.

Additional Information: Departmental Category: Quantitative Economics

ECON 8010 (3) Economics of Risk and Time

Focuses on new techniques for analyzing behavior in relation to risk and time.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 8020 (3) Business Cycle Theory and Monetary and Fiscal Policy

Discusses monetary and non-monetary theories of business cycles in the light of empirical evidence and what those theories imply for monetary and fiscal policy. Emphasizes a deep understanding of the mechanisms within models, their comparative statics and comparative dynamics and the importance of, and evidence for, difference parameter values within business cycle models.

Requisites: Restricted to graduate students only.

ECON 8209 (3) Economics Research Methods Workshop 1

Assists students starting their doctoral thesis by discussing methodology and evaluation of economic research. Presents and discusses student research proposals.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 8211 (3) Public Economics: Fundamental Principles

Presents the fundamental principles of public goods, externalities, public choice, excess burden, optimal taxation, and tax incidence.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Economics

ECON 8219 (3) Economics Research Methods Workshop 2

Continuation of ECON 8209. Assists students starting their doctoral thesis by discussing relevant economic research. Presents and discusses research papers.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 8221 (3) Public Economics: Topics in Public Expenditures and Taxation

Explores advanced topics in public economics such as decentralization, state and local government, program analysis, taxation, international tax issues, political economy issues, and market failure.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Economics

ECON 8231 (3) Local Public Economics

Examines subnational governments and systems of governments, the effects of inter-governmental competition, appropriate tax and expenditure responsibilities, and variations in governing institutions. Covers congestible public goods, Tiebout mechanisms, and tax capitalization.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Economics

ECON 8413 (3) Seminar: International Trade Theory

Covers theories of comparative advantage, including the classical, factor-proportions, fixed-factor, and noncompetitive markets models. Examines trade policy including trade barriers, market distortions, strategic policy, regional integration, political economy, and factor migration.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Trade and Finance

ECON 8423 (3) Seminar: International Finance

Highlights foreign exchange markets, past and current international monetary mechanisms, and processes of adjustment. Examines the role of international financial markets for the behavior of consumption, investment, saving, and production. Also considers international transmission of business cycles.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Trade and Finance

ECON 8433 (3) Seminar: Topics in Money and International Economics

Explores advanced work in various aspects of international economics, such as empirical trade analysis, public choice, and interactions between real and monetary phenomena in the world economy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Trade and Finance

ECON 8534 (3) Economic History of North America

Examines North America's past from the perspective of economics. Topics include growth and welfare in the colonial period; staple products, agricultural development, and the emerging industrialism in the antebellum period; transformation of the North American economy to 1914; the interwar years and the Great Depression; and economic integration since 1945.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic History

ECON 8535 (3) Environmental Economics I

Considers the allocation of society's scarce environmental resources and government attempts to achieve more efficient and equitable allocations. It is a course in applied welfare economics with an emphasis on market failure and valuation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 8545 (3) Environmental Economics II

Provides advanced study of recent advances in environmental economics and explores opportunities for new research. Topics vary with interests of instructor and students.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 8676 (3) Seminar: Labor Economics 1

Focuses on the demand side of labor markets. Topics include standard static and dynamic models of labor demand, labor market discrimination, composition of compensation, labor hierarchies within enterprises, unionization, efficient contracts, and macroeconomics of labor markets.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Labor and Human Resources

ECON 8686 (3) Seminar: Labor Economics 2

Focuses on special topics in labor economics: dynamic theories of labor supply, employment, and unemployment; labor supply in a household framework; and labor market activity and income distribution. Explores both theoretical models and empirical tests in each area.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Labor and Human Resources

ECON 8747 (3) Industrial Organization Theory

Highlights economics of regulation of industry and markets, industry studies, and the application of lab methods to industrial organization.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Industrial Organization

ECON 8757 (3) Industrial Organization and Public Policy

Addresses the theory of interaction of firms within markets and industries, emphasizing importance of the number, relative size of firms, market institution, firm strategies and nature of consumer demand. Examines neoclassical and game theoretic models, empirical industry studies and laboratory tests of theoretical models and policies.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Industrial Organization

ECON 8764 (3) History of Economic Development

Covers in historical perspective the causes of economic development including why some areas develop faster than others and why development occurs more rapidly in some eras than others.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic History
Departmental Category: Asia Content

ECON 8774 (3) Seminar in Transition Economies

Focuses on the problems encountered in countries evolving from planned to market economies. Emphasizes applications of new and traditional models of economic growth and analysis of problems unique to formerly planned economies.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic Development

ECON 8784 (3) Economic Development

Explores empirical, theoretical and policy issues in economic development. Examines political economy, income distribution and poverty, demographic change, labor force employment and migration, human capital, physical capital, natural resources and the environment, industrial structure, international trade and finance, stabilization policy and structural adjustment.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic Development

ECON 8828 (3) Seminar: Econometrics 1

First semester of two-semester sequence in econometrics for PhD students. Studies least squares and generalized least squares estimation of linear econometric models. Asymptotic (large sample) theory of inference. Some topics in the estimation of microdata.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8838 (3) Seminar: Econometrics 2

Teaches the advanced level of econometrics theory. Topics include asymptotic theory, maximum likelihood estimation, limited dependent variables analysis and other frontier areas of econometrics such as the method of moment estimation, semiparametric and nonparametric estimation procedure.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8848 (3) Applied Microeconometrics

Presents a "user's guide" to conducting empirical research in applied microeconomics. Begins with a primer on an industry-standard econometric software package including programming techniques and data management. Introduces advanced econometric techniques including panel data methods, IV, matching models, regression discontinuity and limited dependent variables models. Concludes with a research project requiring a replication and/or extension of an existing published paper

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8858 (3) Computational and Structural Estimation Methods

Teaches students to construct a variety of applied economic models, obtain parameter values through calibration or estimation techniques and uses the resulting models to conduct policy simulations.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8909 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 8999 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Independent Study and Other Courses

Economics - Doctor of Philosophy (PhD)

Our PhD program focuses on a solid core curriculum in economic theory and econometrics. Beyond this, we offer a number of specialized fields of study: econometrics, economic development, economic history, industrial organization, international trade and finance, labor and human resources, natural resources and environmental economics and public economics.

Master's Degree in Economics

The Department of Economics does not currently offer a stand-alone MA degree program, although students enrolled in our PhD program will earn their MA degree as they progress toward their doctorate.

Admission

An applicant for admission as a regular degree student must:

- Hold a baccalaureate degree from a college or university of recognized standing, or have done work equivalent to that required for such a degree and equivalent to the degree given at this university. The undergraduate GPA must be at least 2.75 (2.00=C).
- Have completed intermediate microeconomic and macroeconomic theory courses, 6 credit hours of calculus at the university level or equivalent, and statistics.
- Submit Graduate Record Examination (GRE) scores for aptitude (verbal and quantitative). International applicants whose native language is not English must also submit a TOEFL score with a speaking component, even if they have attended college in an English-speaking country.
- Arrange for the submission of three letters of recommendation.

Graduate study in economics is quantitative and analytical. Students should be comfortable with basic calculus (derivatives and integration), linear algebra, matrix algebra and basic statistics.

The university deadline for international applications is Dec. 1 for the following fall semester. The department encourages international applicants to comply with this deadline. Late applications may be considered; however, they may be at a disadvantage with respect to the award of financial aid. Domestic applicants who wish to be considered for financial assistance should apply by Jan. 10. Students must begin the program in a fall semester.

Degree Requirements

Full-time students are expected to complete all requirements for the PhD degree within five years of entering the program (the maximum time allowed by the Graduate School is six years). The schedule of required courses is centered on this expectation. Failure to make timely and satisfactory progress toward the degree may result in loss of financial assistance or dismissal from the program.

Course Requirements

1. Prior to beginning the program, students must demonstrate an acceptable degree of competence in differential and integral calculus and optimization techniques. (This requirement is in addition to the six credit hours of calculus required to apply to the program.) Such competence is normally demonstrated by taking ECON 7800 (an intensive, three-week preparatory course offered immediately prior to each fall semester) and passing its final examination with a grade

of B- or better. Students who fail this examination must enter into extensive consultation with the director of graduate studies (DGS). Other methods by which the required competence may be demonstrated:

- obtain written approval from the DGS to waive the requirement for ECON 7800 due to sufficient mathematical preparation in prior studies, or
 - pass the final examination in ECON 7800 at a level of B- without taking the course.
2. There are seven core courses in the PhD program: ECON 7010, ECON 7020, ECON 7030, ECON 7040, ECON 7050, ECON 7818 and ECON 7828. Course requirements beyond the core courses include:
 - Seven elective courses at the 8000 level. Basic fields are econometrics, economic development, economic history, industrial organization, international trade and finance, labor and human resources, natural resources and environmental economics and public economics. Ordinarily, a student would take two elective courses in a basic field of specialization in preparation for a dissertation.
 - 6 credit hours in a research colloquium.
 - At least 30 credit hours of dissertation.
 3. At least four of the core courses must be taken on the Boulder campus. Courses transferred for credit must be approved by the DGS. After entry into the PhD program, all remaining courses must be taken on the Boulder campus.
 4. All courses for PhD credit taken on the Boulder campus must be passed with a grade of B- or better. A student who receives a grade of C+ or lower in a core course must retake that course the following academic year.
 5. No more than 12 credit hours (exclusive of dissertation credit hours) from a single faculty member may be counted toward PhD requirements. Independent study is allowed only to satisfy elective requirements. No more than 6 credit hours of independent study may be applied to the PhD degree and no more than 3 credit hours of independent study may be taken from a single faculty member. In consultation with the DGS, students may choose to take up to two graduate offerings in other departments as elective courses.
 6. Course requirements include:

Course	Title	Credit Hours
First Year		
Fall Semester		
ECON 7010	Microeconomic Theory 1	3
ECON 7020	Macroeconomic Theory 1	3
ECON 7818	Mathematical Statistics for Economists	3
		Credit Hours
		9
Spring Semester		
ECON 7030	Microeconomic Theory 2	3
ECON 7040	Macroeconomic Theory 2	3
ECON 7828	Econometrics	3
		Credit Hours
		9

Second Year		
Fall Semester		
ECON 7050	Advanced Economic Theory	3
Elective course		3
Elective course		3
	Credit Hours	9
Spring Semester		
Elective course		3
Elective course		3
Elective course		3
	Credit Hours	9
Third Year		
Fall Semester		
ECON 8209	Economics Research Methods Workshop 1	3
Remaining elective course(s)		3
Dissertation research, if practicable		
	Credit Hours	6
Spring Semester		
ECON 8219	Economics Research Methods Workshop 2	3
Remaining elective course(s)		3
Dissertation research, if practicable		
	Credit Hours	6
Fourth Year		
Fall Semester		
Relevant dissertation credit hours		6
	Credit Hours	6
Spring Semester		
Relevant dissertation credit hours		8
	Credit Hours	8
Fifth Year		
Fall Semester		
Relevant dissertation credit hours		8
	Credit Hours	8
Spring Semester		
Relevant dissertation credit hours		8
	Credit Hours	8
	Total Credit Hours	78

Preliminary Examinations

Written preliminary examinations in microeconomic theory, macroeconomic theory and econometrics must be taken in the examination period following the successful completion of core courses in these areas. Under most circumstances this period would be in August prior to the second year. An examination attempted and failed must be

taken again and passed in the next examination period. A second failure results in dismissal from the program, subject to appeal to the GCRC under extraordinary circumstances. In no case are attempts beyond the third granted.

Students who have failed any of the core courses are ineligible to take the preliminary examination in the area of failure. These students must retake the failed course(s) in the following year and attempt the relevant preliminary examination in the first scheduled examination period after they pass.

Students who fail to pass all three preliminary examinations within two-and-one-half years of beginning the PhD program must exit the program.

MA Degree

An MA degree will be awarded to students who have successfully completed all core courses in the PhD program, completed 30 hours of graduate credit with a 3.00 GPA and performed satisfactorily within two attempts on at least two out of three preliminary examinations.

Third-Year Research Colloquium

Third-year students are expected to register for 3 credit hours per semester in the research colloquium, which will meet weekly under the direction of a faculty member. The purpose of the colloquium is to provide students the opportunity and guidance to complete the required third-year paper and to facilitate progress toward the dissertation stage.

Under some circumstances, students may delay taking this colloquium until the fourth year with the approval of the DGS.

Comprehensive Examination

Students must take an oral comprehensive examination before admission to PhD candidacy. This examination may occur either at the time of the student's research presentation in ECON 8219 or at a later date, and will encompass the materials in the presentation and all relevant course work completed by the candidate. Students who fail this comprehensive examination will be given a second chance during the following semester. For those students for whom the presentation in ECON 8219 does not serve as the oral comprehensive examination, a separate oral examination must be scheduled before admission to candidacy. Students who do not pass this exam by the end of their fifth year must exit the program.

Admission to Candidacy and Dissertation Requirements

Students are formally admitted to candidacy for the PhD degree after completing all course requirements and all preliminary and comprehensive examinations and after earning four semesters of residency (see the Doctoral Degree Requirements (p. 867) section of this catalog for details). After admission to candidacy, students must register each fall and spring semester for dissertation credit (ECON 8999) until attaining the degree; the accumulated credit for the thesis must total at least 30 credit hours to attain the degree. A student must prepare a written dissertation and successfully pass an oral examination before a dissertation committee and other interested persons on its content before receiving the degree. The minimum residence requirement for the PhD degree is six semesters of scholarly work beyond the bachelor's degree.

Administration: Examining Committees for Examinations

Examining committees for preliminary examinations consist of three members of the economics department who teach in the relevant area.

Examining committees for comprehensive examinations consist of at least three members of the economics department.

Preliminary Examinations

1. Written examinations are numbered so that insofar as possible the identity of the student is unknown. Each faculty member grades independently and writes no comments in the examination booklet. A meeting of the graders is called by the chair of the examination committee and the committee grade is submitted to the graduate program coordinator. The possible grades include "High Pass," "Pass" and "Fail."
2. In cases where there is a question of pass or fail on any exam, if two of the members of the examination committee vote affirmatively, a grade of pass will be recorded; if two of the members of the grading committee vote negatively, a grade of fail will be recorded. If the vote of the grading committee is tied and the third member is absent (but will be available within seven days), the decision to pass or to fail is to be made by the reconvened grading committee. If fewer than two members of the grading committee are present and voting, or if the vote of the grading committee is tied and the third member is not available within seven days, the decision to pass or fail will be made by the Graduate Curriculum and Review Committee; in such circumstances the grade is reported as pass or fail, based on a majority vote.
3. When examination results are reported, a student who failed should have an opportunity to discuss his performance with a member of the examining committee.

Dissertation Guidelines

1. In January of the academic year following the research colloquium, each student must submit a written dissertation proposal and conduct an oral defense of that proposal before his or her basic committee. A dissertation proposal form must be signed by each member of the basic committee and submitted to the graduate program coordinator. The basic committee consists of the student's faculty supervisor and three other faculty members from the department. An acceptable proposal must include a statement of purpose and a justification for the importance of the work; a full literature review and a statement of how this research will contribute to the literature; and a detailed description of the methodologies to be used and of the data bases, if appropriate.
2. Normally students are expected to complete their dissertations by the end of their fifth academic year. The graduate program coordinator provides details on submission of the dissertation and arrangements for the oral defense. The final defense is conducted before a basic committee of four faculty members from the department plus one outside member. After the defense, minor changes are agreed upon between candidate and supervisor before the final dissertation is submitted.

English

The English Department offers a Master of Arts degree (MA) in literature, a Master of Fine Arts degree (MFA) in creative writing and a Doctor of Philosophy degree (PhD) in literature.

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/english/grad-studies>) webpage.

Course code for this program is ENGL.

Master's Degrees

- English - Master of Arts (MA) (p. 968)
- Creative Writing - Master of Fine Arts (MFA) (p. 967)

Doctoral Degree

- English - Doctor of Philosophy (PhD) (p. 969)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baker, Donald C.
Professor Emeritus

Bassoff, Bruce
Professor Emeritus

Beechy, Tiffany R. (https://experts.colorado.edu/display/fisid_149775)
Assistant Professor; PhD, University of Oregon

Bell, Michael
Professor Emeritus

Bickman, Martin (https://experts.colorado.edu/display/fisid_100230)
Professor; PhD, University of Pennsylvania

Billingsley, Ronald
Professor Emeritus

Boardman, Arthur M.
Professor Emeritus

Bradley, Adam Francis (https://experts.colorado.edu/display/fisid_147509)
Associate Professor; PhD, Harvard University

Brylowe, Thora (https://experts.colorado.edu/display/fisid_156063)
Assistant Professor; PhD, Carnegie Mellon University

Burger, Douglas A.
Professor Emeritus

Carr, Julia Alice (https://experts.colorado.edu/display/fisid_143349)
Associate Professor; PhD, University of California-Berkeley

Cox, Jeffrey N (https://experts.colorado.edu/display/fisid_113253)
Professor; PhD, University of Virginia

Deagman, Rachael Nicole (https://experts.colorado.edu/display/fisid_154125)
Instructor; PhD, Duke University

Deshell, Jeffrey (https://experts.colorado.edu/display/fisid_118482)
Professor; PhD, SUNY at Buffalo

Douglas, Marcia B (https://experts.colorado.edu/display/fisid_122696)
Associate Professor; PhD, SUNY at Binghamton

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Gladstone, Jason Daniel (https://experts.colorado.edu/display/fisid_154914)
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Professor; PhD, Harvard University

Gordon, Noah Eli (https://experts.colorado.edu/display/fisid_147334)
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Harrington, Emily Marie (https://experts.colorado.edu/display/fisid_154601)
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Hasan, Raza Ali (https://experts.colorado.edu/display/fisid_146167)
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Heydt-Stevenson, Jillian (https://experts.colorado.edu/display/fisid_111683)
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Hogan, Linda
Professor Emeritus

Hurley, Kelly K (https://experts.colorado.edu/display/fisid_105553)
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Jacobs, Karen S (https://experts.colorado.edu/display/fisid_100280)
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Katz, Steven
Professor Emeritus

Kawin, Bruce F.
Professor Emeritus

Kelsey, Penelope M. (https://experts.colorado.edu/display/fisid_147607)
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Kinneavy, Gerald B.
Professor Emeritus

Klages, Mary K (https://experts.colorado.edu/display/fisid_101897)
Associate Professor; PhD, Stanford University

Kocher, Ruth Ellen (https://experts.colorado.edu/display/fisid_143618)
Professor; PhD, Arizona State University

Krauth, Philip L.
Professor Emeritus

Krysl, Marilyn D.
Professor Emeritus

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Labio, Catherine (https://experts.colorado.edu/display/fisid_147608)
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Lagman, Eileen Anne (https://experts.colorado.edu/display/fisid_156308)
Assistant Professor; MA, DePaul University

Lamos, Steven Joseph (https://experts.colorado.edu/display/fisid_141169)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Levitt, Paul M.
Professor Emeritus

Little, Katherine C. (https://experts.colorado.edu/display/fisid_149872)
Professor; PhD, Duke University

Lyons, Thomas
Professor Emeritus

Mattar, Karim (https://experts.colorado.edu/display/fisid_153056)
Assistant Professor; DPhil, Oxford Univ (England)

Michelson, Peter F.
Professor Emeritus

Moskovit, Leonard
Professor Emeritus

Muller-Sievers, Helmut Heinz (https://experts.colorado.edu/display/fisid_147511)
Professor; PhD, Stanford University

Munkhoff, Richelle (https://experts.colorado.edu/display/fisid_143801)
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Nugent, Teresa L (https://experts.colorado.edu/display/fisid_101477)
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Preston, Michael J.
Professor Emeritus

Proudfit, Charles L.
Professor Emeritus

Rivera, John-Michael (https://experts.colorado.edu/display/fisid_118393)
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Rivers, Julius Edwin (https://experts.colorado.edu/display/fisid_101652)
Professor; PhD, University of Oregon

Robertson, Benjamin John (https://experts.colorado.edu/display/fisid_146500)

Instructor; PhD, SUNY at Buffalo

Robinson, Jeffrey C.
Professor Emeritus

Saner, Reginald A.
Professor Emeritus

Sawin, Lewis
Professor Emeritus

Sheffield, Elisabeth Ann (https://experts.colorado.edu/display/fisid_123500)

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Stein, Lara C (https://experts.colorado.edu/display/fisid_156437)

Stevenson, John A (https://experts.colorado.edu/display/fisid_101656)
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Sullivan, Patricia A (https://experts.colorado.edu/display/fisid_126640)
Professor; PhD, Ohio State University

Toulouse, Teresa A (https://experts.colorado.edu/display/fisid_143728)
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Windell, Maria A. (https://experts.colorado.edu/display/fisid_154605)
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Winkiel, Laura Ann (https://experts.colorado.edu/display/fisid_145813)
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Winokur, Mark (https://experts.colorado.edu/display/fisid_115732)
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Wrenn, John H.
Professor Emeritus

Wright, Constance
Professor Emeritus

Wright, Nicole M (https://experts.colorado.edu/display/fisid_153060)
Assistant Professor; PhD, Yale University

Youngquist, Paul Bruce (https://experts.colorado.edu/display/fisid_147514)
Professor; PhD, University of Virginia

Zemka, Sue (https://experts.colorado.edu/display/fisid_103078)
Professor; PhD, Stanford University

Courses

ENGL 5000 (3) Introduction to Applied Shakespeare

Provides an introduction to the life, work and world of William Shakespeare to prepare students for the Applied Shakespeare Professional Masters Certificate two-week intensive. Students will gain a background in the social, cultural and political context of Renaissance theater, will be introduced to the conventions of Shakespearean drama and will explore key concerns impacting our understanding of Shakespeare's works. Department consent required.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Courses

ENGL 5019 (3) Survey of Contemporary Literary and Cultural Theory

Introduces a variety of critical and theoretical practices informing contemporary literary and cultural studies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5029 (3) British Literature and Culture Before 1800

Introduces graduate level study of medieval and early modern writing through the long eighteenth century. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5059 (3) British Literature and Culture After 1800

Introduces graduate level study of Romantic, Victorian, Modern and Postmodern writing. Emphasizes a wide range of genres, forms, historical background and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5109 (3) Literature and Culture of the United States

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5139 (3) Global Literature and Culture

Introduces graduate level study of recent writing in English from around the world. Emphasizes a wide range of genres, forms, new media, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5169 (3) Multicultural/Postcolonial Studies

Introduces graduate level study of ethnic American and/or postcolonial writing in English, including relevant theoretical discourse. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5199 (3) Studies in Special Topics

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5229 (3) Poetry Workshop

Designed to give students time and impetus to generate poetry and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5239 (3) Fiction Workshop

Designed to give students time and impetus to generate fiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5259 (3) Nonfiction Workshop

Designed to give students time and impetus to generate nonfiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5269 (3) Publishing Workshop

Provides practical experience in the editorial, design, and business procedures of desktop publishing.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5279 (3) Studies in Poetry

Addresses modern poetry, written since World War II.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5299 (3) Studies in Fiction

Addresses modern fiction written since World War II.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5309 (3) Playwriting

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5319 (3) Studies in Literary Movements

Studies styles, trends, innovations and major writers in significant literary movements, particularly those after 1900, such as modernism and postmodernism.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5459 (3) Introduction to the Profession

Introduces purposes, methods and techniques of professional scholarship in English. Provides an overview of the discipline, including traditional areas of research and recent developments. Teaches students how to use research, bibliographic, and reference tools to prepare papers for conferences and publication. Required of all MA students in English.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5529 (3) Studies in Special Topics 1

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: IAWP 6100

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5549 (3) Studies in Special Topics 2

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5559 (3) Studies in Special Topics 3

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5849 (1-6) Independent Study (Graduate Level 1)

Independent investigation of topics of specific interest to individual students. Students wishing to enroll in independent study must petition the Associate Chair for Graduate Studies prior to the beginning of the semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 6949 (1) Master's Degree Candidate

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Graduate Courses

ENGL 6959 (1-9) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7019 (3) Advanced British Literature and Culture Before 1800

Studies special topics in medieval and early modern writing through the long 18th Century. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7059 (3) Advanced British Literature and Culture After 1800

Studies special topics in romantic, Victorian, modern and postmodern writing. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7119 (3) Advanced Literature and Culture of the United States

Studies special topics in writing of the United States.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7149 (3) Advanced Global Literature and Culture

Studies special topics in recent writing in English from around the world.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7179 (3) Advanced Multicultural/Postcolonial Studies

Studies special topics in ethnic American and/or postcolonial writing in English, including relevant theoretical discourses. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7489 (3) Advanced Special Topics

Studies special topics in theory, culture, and literature of any period. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7849 (1-3) Independent Study (Graduate Level 2)

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Courses

ENGL 8999 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Graduate Courses

Creative Writing - Master of Fine Arts (MFA)

The MFA in creative writing is a three-year degree program that values literary study, innovation and writing that tests the limits of conventional forms.

The program challenges students to write in a variety of genres and to study literature from the point of view of a working writer. Recent graduates have become not only published authors of fiction, nonfiction, poetry, plays and screenplays, but also journalists, editors, publishers and college-level and secondary-level teachers.

The degree program culminates in the submission and oral defense of a creative thesis in poetry or fiction. Students may develop custom programs in nonfiction and scriptwriting with available faculty with secondary interests in those genres.

Requirements

The degree requirements listed here are subject to change. Students wishing to pursue graduate work in English should visit the department's Graduate Studies (<http://www.colorado.edu/english/grad-studies>) webpage for the most up-to-date degree requirements.

Admission

Applicants interested in creative writing must complete the verbal, analytic, and quantitative sections of the GRE General Test. A BA degree with an English major or at least 18 credits hours in English is normally required. Each applicant must submit a manuscript of at least 10 pages of poetry, or 25 pages of fiction or nonfiction prose (other than literary criticism).

Course Requirements

Students must take 45 hours of course work (15 courses) in the following areas:

Required Courses

4 courses of writing workshops (fiction, nonfiction, poetry, publishing)	12
4 courses in literature	12
2 courses in two of the following: Studies in Poetry; Studies in Fiction; Studies in Literary Movements	6
9 hours of credit for thesis writing (may not be taken the first year)	9

Electives

2 electives	6
Total Credit Hours	45

Language Requirement

Students earning the creative writing MFA must complete a foreign language requirement, either before or after enrolling at CU Boulder, in one of the following ways:

- Complete a fourth-semester (second-semester sophomore) college language course with a grade of C or better. Completion of only freshman-level language courses does not qualify as evidence of competence.
- Take the foreign language proficiency exam administered each semester by the English department. In some cases, students may be asked to make independent arrangements for such an exam.
- Present other evidence of competency in a foreign language to the associate chair for graduate studies. In most cases, this evidence consists of native or near-native command of a language; a written exam may be administered to confirm such fluency.

English - Master of Arts (MA)

The MA program combines courses in global literatures in English and literary theory with rigorous training in critical analysis. Applicants must complete the verbal, analytic and quantitative sections of the GRE General Test and hold a bachelor's degree by the time they enter the program.

Requirements

Program Requirements

Students earning a Master of Arts in English must take 30 hours of course work (10 courses), and at least 21 hours must be taken at CU Boulder. Subject to approval by the Associate Chair for Graduate Studies, up to 6 hours of course work may be taken in departments other than English. Students may earn the MA through course work alone; a thesis is optional.

The degree requirements listed below are subject to change. Students wishing to pursue graduate work in English should visit the department's Graduate Studies (<http://www.colorado.edu/english/grad-studies>) webpage for the most up-to-date degree requirements.

Distribution Requirement

The courses required for the MA should be distributed as follows:

1. Two courses before 1800 (in two different periods)
2. Two courses after 1800 (in two different periods)
3. One multicultural and/or postcolonial course (may overlap with req. 1 or 2)
4. One poetry intensive course (may overlap with req. 1 or 2)

Degree Plans

Plan I: Thesis Option

Courses in the following fields are required. A requirement may be waived if a student has taken an equivalent graduate course at another institution; waivers must be approved by the associate chair for graduate studies.

Required Courses

ENGL 5019	Survey of Contemporary Literary and Cultural Theory (first semester)	3
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ENGL 5459	Introduction to the Profession (second semester)	3
One course from each of the following categories:		12
Formalisms		
Technologies/Epistemologies		
Bodies/Identities/Collectivities		
Cultures/Politics/Histories		
ENGL 6959	Master's Thesis	6
Electives		
Choose additional courses from English or other departments to fulfill 30-credit minimum (may include creative writing)		6
Total Credit Hours		30

A master's thesis is optional for the English MA. If the student wishes to write a thesis, the student works with an individual faculty member on an independent study basis. The master's thesis is about 50–75 pages in length, and represents an original work that is supported by extensive research into primary and secondary sources. It includes an abstract and a bibliography.

Developing a thesis takes two semesters to research and write. Students must register for a total of 3 hours of master's thesis credit during each of the two semesters they are producing their thesis. Students work with a committee of three faculty members: an advisor and two others. The advisor must be a member of the graduate faculty.

The thesis defense must take place before the semester's deadline for completing defenses. Students must give the completed thesis to the entire committee and file an examination report at least two weeks in advance of the defense. The defense is an oral examination of the thesis that lasts about an hour. All committee members must be present. A positive vote from at least two of three committee members is required to pass. A student who fails the defense may not reattempt it for at least three months, and not until any work prescribed by the committee has been completed. The student may retake the examination only once.

The final copy of the thesis must be submitted to the Graduate School by the applicable deadline, and must comply with the Graduate School's specifications for theses and dissertations.

Plan II: Non-Thesis Option

Courses in the following fields are required. A requirement may be waived if a student has taken an equivalent graduate course at another institution; waivers must be approved by the associate chair for graduate studies.

Required Courses

ENGL 5019	Survey of Contemporary Literary and Cultural Theory (first semester)	3
ENGL 5459	Introduction to the Profession (second semester)	3
One course from each of the following categories:		12
Formalisms		
Technologies/Epistemologies		
Bodies/Identities/Collectivities		
Cultures/Politics/Histories		
Electives		
Choose additional courses from English or other departments to fulfill 30-credit minimum (may include creative writing)		12
Total Credit Hours		30

Language Requirement

Students earning the English MA must complete a foreign language requirement demonstrating proficiency in one foreign language by taking the appropriate exam administered each semester by the English department. In some cases, students may be asked to make independent arrangements for such an exam.

Advancement to Candidacy

Students must submit a Candidacy Application for an Advanced Degree in the semester they plan to graduate by the stipulated deadline, which is generally in the third or fourth week of classes. These forms are available from the graduate student program assistant. The Candidacy Application confirms that the student will have completed all their degree requirements by the end of the semester, and must be approved by the associate chair for graduate studies.

Time Limit

MA students have four years from the semester in which they are admitted and begin course work to complete all degree requirements. To continue past four years, the student must file a petition for an extension of the time limit with the dean of the Graduate School. Such petitions must first be submitted for endorsement to the associate chair for graduate studies. Extensions may be granted for up to one year.

English - Doctor of Philosophy (PhD)

The PhD program is a five-year curriculum, including five years of funding, that comprises a language requirement and three basic components:

- course work
- a qualifying examination
- a dissertation

For more information, visit the English Department (<http://www.colorado.edu/english>) website.

Requirements

Admission

The PhD program offers rigorous training in critical analysis and research for professional placement. Applicants must complete the verbal, analytic and quantitative sections of the GRE General Test and hold either an MA or BA degree in English. Those with a BA who apply directly to the PhD program may also be considered for the MA program.

Program Requirements

The degree requirements listed here are subject to change. Students wishing to pursue graduate work in English should visit the department's Graduate Studies (<http://www.colorado.edu/english/grad-studies>) webpage for the most up-to-date degree requirements.

Course Work (Years 1 & 2)

Course work prepares PhD students to write a successful dissertation and to teach effectively in their area of specialty. Students should enroll in graduate seminars serving those ends in English or related fields.

The sole requirement for course work for the PhD is that students take a minimum of 30 credits of graduate study at the University of Colorado (up to 21 of which can be transfer credits). These courses must be at the 5000 level or above.

By the end of the second semester of study, the student should form an advisory committee consisting of three members of the graduate faculty. The advisory committee provides guidance in preparing for the qualifying exam and writing the dissertation.

Students should plan their course work in close consultation either with the associate chair for graduate studies or their advisory committee. A student's first and second years in the PhD program are usually dedicated to course work.

Language Requirement

PhD students must complete a foreign language requirement demonstrating proficiency in one foreign language by taking the appropriate exam administered each semester by the English Department. Work in some areas may require proficiency in more than one language, as determined by a student's advisory committee. In some cases, a student may be asked to make independent arrangements for such an exam.

Annual Reports

PhD students in their second year or beyond are required to submit an annual report on the progress of their PhD work by Oct. 31 of each year. These reports should be no more than one page in length and should describe both the student's dissertation project and the steps taken to advance it (e.g., courses, research, prospectus). Students without current reports on file cannot be considered in good standing. Forms are available from the graduate program assistant and should be submitted via email to either the graduate program assistant or the associate chair of graduate studies.

Qualifying/Comprehensive Examination (Year 3)

The qualifying examination is a two-hour oral exam on two reading lists and a dissertation prospectus produced in consultation with all members of the candidate's advisory committee.

Reading lists concern the following topics.

- Field: The broad context (e.g., historical, thematic, generic, technological) pertinent to the student's dissertation project
- Methods/texts: Methodological, literary and critical works germane to the project.

Each reading list should comprise between 25 and 40 titles, as well as a paragraph (about 300 words) providing a rationale for this content.

The prospectus describes a dissertation project in 8 to 10 pages and should include a methodological overview, an account of relevant scholarship, a brief chapter-by-chapter summary and a bibliography of 25 to 40 titles. It is due to the advisory committee for preliminary evaluation two weeks prior to the date of the qualifying exam. The dissertation project, which should be work of professionally viable scholarship, will typically take the form of a monograph, but it may also contain such innovative elements as practice-based research, curatorial or internet exhibition, fieldwork, etc.

The first chapter or equivalent of the dissertation project is due to the advisory committee no later than three months after passing the qualifying exam. The candidate and full committee then meet to discuss it and create a clear itinerary for completing the project. The graduate program offers an annual dissertation project workshop to assist PhD candidates in crafting their first chapters or equivalents.

Failure to either schedule and pass the qualifying exam or submit the first installment of the dissertation in a timely manner results in

withdrawal of teaching support and suspension from the PhD program. An unsuccessful exam may be retaken once only, within six months.

Students must complete the language requirement and any incomplete grades before scheduling the qualifying exam. At least two weeks before taking the exam, the student must submit the following documents (available on the Graduate School (<http://www.colorado.edu/graduateschool/academic-forms>) website) to the graduate program assistant:

- a candidacy application for an advanced degree
- the doctoral exam form listing the committee members, all of whom must be preapproved by the Graduate School before the exam.

Upon passing the qualifying exam, students advance to PhD candidacy, allowing them to apply for dissertation fellowships and other internal funding.

Dissertation (Years 4 & 5)

The dissertation project is a work of original scholarship that makes a significant contribution to a given field. It is written in close consultation with the student's advisory committee. It should be between 250 and 350 pages long, the length of a scholarly monograph. In some instances, it can combine critical and creative elements, but the finished dissertation should resemble the best work in its field. Students should plan to complete it during their fourth and fifth years in the PhD program.

A PhD student must complete at least 30 dissertation hours to receive the degree. Dissertation hours may be taken in any semester, including before the comprehensive examination is passed. However, no more than 10 credit hours taken before the semester in which the comprehensive examination is passed will count toward the 30 dissertation hours required for the degree.

Beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the dissertation is successfully defended, PhD students are required to register continuously as full-time students with a minimum of 5 dissertation hours in the spring and fall semester of each year.

PhD students who do not have to maintain full-time status and do not have to use campus facilities may claim off-campus status, which allows registration for 3 rather than the minimum of 5 dissertation credit hours. Off-campus status is considered part-time.

PhD students who fail to register continuously after passing the comprehensive examination must retake and pass the examination to regain status as a student in good standing in the Graduate School. The department must petition the dean of the Graduate School to waive this requirement.

PhD students must be registered for a minimum of 5 dissertation hours in the semester (including summer semester) in which the dissertation defense is held.

Dissertation Defense

In the spring of the fifth year, the student should schedule a dissertation defense: an oral examination and discussion lasting about 90 minutes. The student's advisory committee consists of four faculty members from within the department, along with one outside member chosen from the graduate faculty of another department. A positive vote of at least four examiners is required to pass the defense. If unsuccessful, the student may retake the defense once or complete changes or additions determined by the committee.

The student must deliver copies of the dissertation to their committee members at least one month prior to their defense date, and must also file a doctoral examination report and a doctoral defense leaflet (which includes a dissertation abstract) with the Graduate School at least two weeks prior to the defense. All doctoral graduation requirements and forms, including deadlines, can be found on the Graduate School (<http://www.colorado.edu/graduateschool/academics/graduation-requirements/doctoral-graduation-information>) website.

Submission & Format

The final copy of the dissertation must be submitted to the Graduate School by the applicable deadline for that semester, and must comply with the Graduate School's specifications for theses and dissertations. Thesis specifications and submission information can be found on the Graduate School (<http://www.colorado.edu/graduateschool/academics/graduation-requirements/doctoral-graduation-information>) website.

The student must include all stipulated parts of the thesis (e.g., title page, signature page, abstract, table of contents, bibliography). It is also suggested that the Graduate School precheck the format of the thesis before the student submits the final copy. The student should email a PDF of their dissertation to gradinfo@colorado.edu.

Time Limit

PhD students are expected to complete all degree requirements within five years from the semester in which they are admitted and begin course work in the doctoral program. To continue beyond five years, the student must file a petition for an extension of the time limit with the dean of the Graduate School. The dissertation director and the associate chair for graduate studies must endorse such petitions. Extensions may be granted for up to one year. For additional time, the student must file another petition for extension.

Environmental Studies

Meeting the environmental challenges of the 21st century requires research, education and training that spans traditional disciplinary boundaries and emphasizes the interconnections of social and natural sciences, policy and the ethics and other social underpinnings of decision making.

With numerous focal areas and connections to research centers both in and out of the academic world, ENVS provides the resources and experiences needed by students seeking to contribute to environmental research and problem solving.

The Graduate Program in Environmental Studies awards three graduate degrees: MS, MENV and PhD.

Opportunities for interdisciplinary graduate studies and original research leading to the MS and PhD degrees are available with a variety of emphases, including sciences, policy and values, and theory. Particular programs of study are limited only by course offerings and faculty expertise. Several graduate certificates in the field are also available.

For updated information, visit the department's Graduate Students (<http://www.colorado.edu/envs/graduate-students>) webpage.

Course code for this program is ENV5.

Master's Degrees

- Environmental Studies - Master of Science (MS) (p. 974)

- Environment - Master of the Environment (MENV) (p. 973)

Doctoral Degree

- Environmental Studies - Doctor of Philosophy (PhD) (p. 975)

Certificates

- Environment, Policy and Society - Graduate Certificate (p. 978)
- Renewable and Sustainable Energy - Graduate Certificate (p. 979)
- Science and Technology Policy - Graduate Certificate (p. 979)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bhattacharya, Atreyee (https://experts.colorado.edu/display/fisid_156320)
Instructor; PhD, Harvard University

Boykoff, Maxwell Thomas (https://experts.colorado.edu/display/fisid_147562)
Associate Professor; PhD, University of California-Santa Cruz

Carrico, Amanda R. (https://experts.colorado.edu/display/fisid_153054)
Assistant Professor; PhD, Vanderbilt University

Ciplet, David (https://experts.colorado.edu/display/fisid_156064)
Assistant Professor; PhD, Brown University

Collinge, Sharon Kay (https://experts.colorado.edu/display/fisid_107088)
Professor; PhD, Harvard University

Dilling, Lisa (https://experts.colorado.edu/display/fisid_138024)
Associate Professor; PhD, University of California-Santa Barbara

Doak, Daniel Forest (https://experts.colorado.edu/display/fisid_151963)
Professor; PhD, University of Washington

Hale, Benjamin Slater (https://experts.colorado.edu/display/fisid_141456)
Associate Professor; PhD, SUNY at Stony Brook

Hartter, Joel N (https://experts.colorado.edu/display/fisid_154043)
Associate Professor; PhD, University of Florida

Hinckley, Eve-Lyn (https://experts.colorado.edu/display/fisid_147806)
Assistant Professor

Litt, Jill S. (https://experts.colorado.edu/display/fisid_140636)
Associate Professor; PhD, Johns Hopkins University

Miller, Dale Lee (https://experts.colorado.edu/display/fisid_115748)
Senior Instructor; MA, University of Colorado Denver

Neff, Jason C (https://experts.colorado.edu/display/fisid_117652)
Professor; PhD, Stanford University

Newton, Peter (https://experts.colorado.edu/display/fisid_154466)
Assistant Professor; PhD, University of East Anglia (England)

Pielke, Roger A (https://experts.colorado.edu/display/fisid_104166)
Professor; PhD, University of Colorado Boulder

Ritchie, Liesel A. (https://experts.colorado.edu/display/fisid_145347)
Assoc Research Professor

Rogers, Sarah (https://experts.colorado.edu/display/fisid_142221)
Lecturer

Stockton, Keith Michael (https://experts.colorado.edu/display/fisid_143887)
Instructor; PhD, University of Colorado Boulder

Townsend, Alan Ronald (https://experts.colorado.edu/display/fisid_107584)
Professor; PhD, Stanford University

Wessman, Carol A (https://experts.colorado.edu/display/fisid_100909)
PhD, University of Wisconsin-Madison

White, James (https://experts.colorado.edu/display/fisid_102726)
Professor; PhD, Columbia University In the City of New York

Courses

ENVS 5000 (3) Policy, Science, and the Environment

Introduction to methodologies of the policy sciences with emphasis on applications to environmental issues; role of science in decision making; professional roles and responsibilities as a policy analyst.

Requisites: Restricted to Environmental Studies (ENVS) graduate students only.

ENVS 5003 (3) Theory and Methods in Environmental Studies

Introduces students to theory and methods used in research on environmental science, values and policy. The goal of the course is to provide a broad overview of the conceptual background relevant to work and research in environmental studies, with an emphasis on understanding the similarities and differences in research methods used in different disciplines and in environmental research.

Grading Basis: Letter Grade

ENVS 5050 (3) Theories of the Policy Process

Examines the public policy process, including the influences and actors that shape policy outcomes. Focuses on the major theories, frameworks, and models of policy change, along with emerging scholarship that challenges, refines, and advances the theory.

Requisites: Restricted to graduate students only.

ENVS 5100 (1-3) Special Topics in Environmental Studies

A variety of topics not currently offered in curriculum; offered depending on instructor availability and student demand.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ENVS 5110 (1-3) Topics in Environmental Social Science and Humanities

Covers various topics in the social sciences and humanities in environmental studies.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

ENVS 5120 (1-3) Topics in Quantitative Methods

Covers a wide range of quantitative methods used in policy research and their applications. Topics may include decision-making under uncertainty, fundamentals of microeconomics, mathematics of economic efficiency, cost-benefit analysis, system optimization, budgeting, fundamentals or probability, risk assessment, risk perception, risk communication, and decision analysis. Includes practical exercises, as well as readings and discussion, of various strengths and weaknesses of the different methods.

Repeatable: Repeatable for up to 9.00 total credit hours.

ENVS 5240 (3) Environmental Philosophy

A survey of the major philosophical issues in environmental studies, comprising key issues in environmental ethics, in environmental political philosophy and in the philosophy of biology and ecology.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5240

Requisites: Restricted to Environmental Studies (ENVS) graduate students only.

ENVS 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4340, EBIO 4340 and EBIO 5340

Recommended: Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

ENVS 5510 (1) Environmental Studies Colloquia Series

All first year ENVS graduate students are required to attend the ENVS Colloquia Series. Speakers from around the world and within the department cover topics in all areas of Environmental Studies.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

ENVS 5520 (1-3) Seminar in Environmental Studies

Addresses current topics in Environmental Studies. Provides forum for students to critically evaluate the primary literature on a particular theme.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

ENVS 5701 (3) Policy, Politics and Management: Foundations

Examines concepts related to policy and regulatory processes, institutions and management of the environment and natural resources. Explores environmental laws at the international, national, state and local levels as well as how the processes and institutions at various levels of government help shape laws and their implementation. Focuses on policy tools including property rights, regulation, voluntary compliance and market-based mechanisms.

Grading Basis: Letter Grade

ENVS 5702 (3) Policy, Politics and Management: Theory and Practice

Provides an overview of the theoretical landscape for how policies are made, decisions are enacted and actors seek to influence policy and political outcomes. Students will learn tools of policy analysis and apply their understanding to cases of environmental, natural resource and related policies.

Grading Basis: Letter Grade

ENVS 5740 (3) Context-Sensitive Research Methods

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7116

Requisites: Restricted to graduate students only.

ENVS 5810 (3) Water Resources and Environmental Sustainability

Assesses impacts of climate variability and regional growth on western U.S. water resources, and examines successes and failures of different management strategies, as well as ways that science is used and misused in support of water management.

Requisites: Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

ENVS 5820 (3) Energy Policy in the 21st Century

Examines energy policy and the problem of sustainability through a variety of disciplinary and topical perspectives: historical, political, behavioral, techno-economic and legal. A critical approach is applied to arguments about energy policy processes, systems and desired outcomes, with special emphasis on the role of renewable and sustainable energy in the changing global system.

Requisites: Restricted to graduate students only.

ENVS 5830 (3) Critical Issues in Climate and the Environment

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4800 and ATOC 5000

ENVS 5840 (3) Global Biogeochemical Cycles

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed, along with global-scale measurements of element fluxes from satellites, aircraft and measurement networks.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5305

Requisites: Restricted to graduate students only.

Recommended: Prerequisite general chemistry, some organic chemistry.

ENVS 5909 (1-3) Independent Study

Only 3 hours of independent study can be used towards degree requirements.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ENVS 5930 (2) Internship

Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to the students' research and career goals, and to relate classroom theory to practice.

ENVS 6007 (3) Foundations of Environmental Sociology

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 6007

ENVS 6201 (3) Qualitative Research Methods for Environmental Studies

Introduces students to research design, data collection and analysis methods. Exploration of the rationale underlying the use of various methods, the skills needed to employ qualitative method and the process of designing a research protocol will provide graduate students with a sound foundation to begin their own thesis research.

Grading Basis: Letter Grade

ENVS 6222 (2-3) Environmental Decision-Making

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7222

Grading Basis: Letter Grade

ENVS 6301 (3) Environmental and Energy Economics

Introduces non-economists to the study of energy markets, environmental externalities, economic regulation and public policy. This applied course uses examples from electricity generation, renewable energy, manufacturing, transportation and other energy intensive industries. A variety of policy instruments will be studied, including: technology standards, subsidies, environmental mandates, rate-based policies, emissions taxes and cap-and-trade systems.

Grading Basis: Letter Grade

ENVS 6302 (3) Sustainable Landscapes, Sustainable Livelihoods

Examine adaptation of rural and resource dependent regions and communities in response to cultural, economic and environmental change. Students will evaluate different approaches for sustainable management of forests, ranches, farms and wildlands and to balance diverse livelihood needs and environmental stewardship in a time of rapid change. Students will learn techniques to gather and synthesize data that support solution development.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ENVS 6303 (3) Transportation and Sustainable Cities

Examines the problem of organizing transportation systems from a variety of perspectives and explores how transportation decisions get made at a variety of scales, from local to national. Covers some of the dramatic changes coming from technological innovation in arenas like vehicle electrification, autonomous vehicles and the potential shift from individual vehicle ownership to shared mobility.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ENVS 6304 (3) Introduction to Food Systems Internationally

Introduces students to contemporary food system challenges at the global scale, the course will first identify key historic and projected trends, to set the scene for the remainder of this specialization. Second it will draw on international case studies to explore some of the institutional, technological and market responses to food system challenges across the globe.

Grading Basis: Letter Grade

ENVS 6305 (3) Food System Solutions? Evaluation of Food System Debates

Using the best available evidence, students will critically evaluate how food system sustainability may be enhanced by proposed solutions, such as genetically engineered food, organic foods, local food systems, dietary changes and reductions in food waste. Explores the environmental implications of these potential solutions and the opportunities for them to gain traction and become more mainstream.

Grading Basis: Letter Grade

ENVS 6940 (1) Master's Degree Candidacy

Grading Basis: Pass/Fail

ENVS 6950 (1-6) Master's Thesis**ENVS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Environment - Master of the Environment (MENV)

The Masters of the Environment (MENV) professional master's degree program is administered by the Environmental Studies Program (p. 970), but partners with units and disciplines in the community and across the Boulder campus, including the Environmental Design Program, Colorado Law, Leeds School of Business and the Department of Economics.

The 17-month, cohort-based, in-residence professional degree program is designed for new or early career professionals, preparing leaders at the local, state, national and global levels to sustain the long-term health of the biosphere and pursue sustainable development. MENV graduates apply interdisciplinary knowledge and build community in ways that achieve fair and effective solutions to environmental and social problems and promote thriving human and natural communities, balancing concerns for environmental health, economic well-being and social equity.

The program focuses on applications and problem solving, and has five parts:

1. the core curriculum
2. a choice of topical specializations
3. skills and techniques courses
4. electives
5. a capstone project

Throughout the program, students develop and hone their skills and leadership capacities through workshops, peer-to-peer mentoring, professional skills courses, the capstone project and other "real-world" opportunities through partnerships with outside firms, agencies and organizations.

Students become conversant in the language, knowledge, techniques and methodologies of various disciplines while developing general analytical skills, problem-solving abilities and the adaptability that is indispensable to professional success.

MENV provides a foundation of multidisciplinary knowledge and communication and analytical skills that enable students to address increasingly complex environmental and related social problems in a

wide range of professional careers in the environment, energy and natural resources.

For more information, visit the Masters of the Environment (<http://www.colorado.edu/menv>) website.

Requirements

Application Requirements

To be considered for the Masters of the Environment graduate program, students must have a four-year bachelor's degree from an accredited college and some applicable training or professional experience. The MENV program at CU Boulder selects students who will achieve academic and professional success while adding value to the graduate community. The master's program selects the most talented and diverse candidates through a holistic review of the application materials. Decisions are based on academic and professional backgrounds and individual potential to contribute both inside and outside of the classroom.

Program Requirements

Students must complete at least 42 credit hours of course work during the 17-month program, to include:

- the core curriculum
- a specialization area
- two skills and techniques courses
- electives
- a capstone project

Capstone Project

All MENV students complete a year-long capstone project. These projects provide hands-on, learning-by-doing experiences embedded in the context of an organization's needs and capacities, while also providing client organizations with specific solutions to identified complex problems and useful projects. These might include management plans, models, analyses, prototypes or proof-of-concept projects. The capstone project is co-developed by students and the partner entity, whether industry, government or nonprofit.

Environmental Studies - Master of Science (MS)

The ENVS Master of Science degree is a research-based graduate program that allows students to conduct research and course work in a range of areas important for the environment and sustainability. For most students, the heart of the MS program is completion of a master's thesis. For the two dual degree programs (see below), there also is an option to complete an internship in lieu of a thesis.

Dual Degree Programs

MBA/MS in Environmental Studies

This is a dual degree program offered in conjunction with the Leeds School of Business. It requires 36 credit hours of graduate work in environmental studies and 43 credit hours of MBA course work (with 12 credit hours of environmental studies course work applying toward the required 55 credit hours for the MBA). The MBA program will be considered the student's primary program. For more information, visit the program's MS/MBA (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/masters-degree/msmba>) webpage.

JD/MS or PhD in Environmental Studies

This is a dual degree program offered in conjunction with the Law School. The Law School will grant credit for acceptable performance in graduate-level environmental studies courses toward the JD degree for up to 9 (for MS students) or 12 (for PhD students) credit hours of the required 89 credit hours for the JD degree. Environmental studies will grant up to 9 (for MS students) or 12 (for PhD students) credit hours of acceptable performance in law courses. The JD program will be considered the student's primary program. For more information, visit the program's MS/Juris Doctor and PhD/Juris Doctor (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/masters-degree/msjuris-doctor-and-phdjuris-doctor>) webpage.

Requirements

Course Requirements

The degree requires completion of 36 credit hours, as follows:

- a common core consisting of two broad, introductory 3-credit courses (ENVS 5000 Policy, Science, and the Environment and ENVS 5003 Theory and Methods in Environmental Studies)
- two semesters of ENVS Colloquium (2 course credits)

All MS students must complete a guidance committee meeting and either an MS thesis or an internship. For most students, the final requirement is a thesis worth 6 of the 36 credit hours required for the MS degree. All ENVS graduate students are encouraged to include a 2-credit internship as part of their degree plan, even if doing a thesis.

Independent study credits may be included in the student's MS degree plan with the approval of the faculty advisor.

Guidance Committee Meeting

During the first six weeks of each new student's first semester (typically in the fall), a guidance committee of three faculty members will examine the student's past course record (from undergraduate and past graduate work) and devise a program of course work for that student. Responsibility for convening these meetings falls on the advisor. However, the graduate director and graduate assistant will aid in the scheduling of these meetings and, if needed, intervene to ensure they occur on schedule. These committees and their meeting should be shaped by these considerations:

- The committee should be composed of the primary advisor and at least two other faculty members. To ensure breadth of viewpoints, one member of the committee will be assigned by the Graduate Committee and will be someone outside the student's specific areas of research interest. The Graduate Committee must approve the composition of each committee to ensure that appropriate knowledge of ENVS procedures and history are represented.
- Before the committee meeting, the student should provide a brief overview of their intellectual interests and provide an assessment of their own weaknesses and strengths in training.
- The committee, working with the student, should devise a list of both suggested and mandated courses. Course work can be specified as either a single course or a type of course (e.g., "a course covering the use of multivariate statistics," as opposed to a specific course number). In addition, the committee can suggest that the student TA certain classes as another way of exposing them to particular fields; any such suggestions should consider the feasibility of the student actually being able to TA such a course.

- The assigned course work should provide the student with depth of understanding in their research field(s) and ensure that the student has some breadth of training or experience in one or more other aspects of environmental studies.
- While the number of classes suggested or mandated will vary depending on each student's past training and research plans, a typical list of required classes for an MS student should generally not exceed four 3- or 4-credit classes.
- This first-semester guidance committee's work is finished after its one meeting, with no requirement that the members be on subsequent committees for a student.

MS Thesis or Internship

Thesis Requirements

Only students in the two dual degree programs (MS/MBA and MS/JD) may opt for the internship option (see below); all MS-only students must complete a thesis. The thesis is based on original research and written under the supervision of a faculty advisor.

There are several steps in conducting this research and then defending the thesis:

1. In conjunction with their advisor, the student must assemble a three-member thesis defense committee that normally will meet by the end of the student's second semester of study. This committee must consist of at least three CU Boulder graduate faculty members and must include at least one rostered or associate ENVS faculty member.
At least two weeks before this committee meets, the student will submit a five-page research proposal to the committee members. During the meeting, the committee will question the student on the proposal and review the student's progress on suggested and required course work and suggest changes.
For a student to continue on in the program, their committee must approve their proposal and may require additional written revisions prior to approval.
2. A successful thesis must be an original research paper or report that is presented to the student's thesis defense committee and defended in line with the deadlines posted each semester by the Graduate School in order to be considered for graduation.
The thesis represents 6 credit hours of work and must comply with the specifications for theses and dissertations available in the Graduate School.
The expectation is that a research-based master's thesis would, at a minimum, be equivalent to a viable manuscript that could be submitted as one peer-reviewed research paper. For a client-based thesis, the report should meet the requirements of the stakeholder, agreed to at the time of writing the MS proposal.
See the Grad Alumni (<http://www.colorado.edu/envs/people/alumni>) page for examples of past MS theses.
3. The candidate for the MS degree, with the approval of the faculty advisor, must assemble a three-member thesis defense committee that should include an outside member from the appropriate environmental field. The graduate coordinator reports the names of the committee members and the date of the thesis defense to the Graduate School on the master's examination report form (<http://www.colorado.edu/graduateschool/current-students>) at least two weeks prior to the defense date.
It is important to stay in touch with the graduate coordinator about the committee composition, since all committee members need to be

checked for graduate faculty appointments that take at least a month to process.

During the semester in which the student plans to complete the requirements for the MS degree, an admission to candidacy application must also be completed and approved by the advisor and graduate director, and submitted to the Graduate School by the posted deadline. A copy must be submitted to the graduate program assistant.

Dates and forms are available in the master's packets for the thesis and non-thesis programs.

4. At the thesis defense meeting, the committee will question the student and review their work. The committee will also review the student's completion of course work assigned in previous committee meetings.

A student may graduate without completing all the formally assigned course work, with the approval of the committee.

After the thesis has been successfully defended, the student must be sure that the signature page with the original signatures of the chair of the examining committee and at least one other committee member is submitted to the Graduate School. The student must also electronically submit the thesis to ProQuest (<http://www.etdadmin.com/cgi-bin/school?siteid=70>) according to the Graduate School instructions (<http://www.colorado.edu/graduateschool/current-students>).

Internship Options for MS/MBA & MS/JD Students

Students pursuing one of the dual degree programs may complete 36 graduate credit hours, including a 2-credit Internship for which a substantial internship report is written, with no thesis required (see the Internship (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/masters-degree/plan-ii-non-thesis-option/internships>) webpage for more information on internships).

Students who opt for this plan must be sure to complete a master's course plan approval form (<http://www.colorado.edu/graduateschool/current-students>) in addition to the candidacy application (<http://www.colorado.edu/graduateschool/current-students>) by the posted Graduate School deadline. These forms require the signatures of the student's advisor, graduate director and department chair. Copies of the forms must be filed with the graduate coordinator.

Environmental Studies - Doctor of Philosophy (PhD)

The Environmental Studies graduate program at CU Boulder provides in-depth, interdisciplinary training for students interested in making contributions to the understanding of various social and environmental systems, and to the solving of environmental problems. The program is flexibly structured, with the goal of supporting individual student interests and providing them with the ability to seek the best training possible for these interests.

The PhD degree is a research degree, involving the production of a major piece of original research (the dissertation). Students within the program conduct research in a variety of environmental fields, usually working closely with one or more faculty advisors and committee members.

While a student's research project shapes much of their graduate career, course work, colloquia and other activities are also key parts of the graduate experience, and in ENVS they're particularly important

in providing the breadth of knowledge that is key for those seeking to contribute to environmental research and management.

Among the knowledge and skills that we seek to provide to every student are:

- the ability to evaluate policy goals in the context of competing societal objectives
- fundamental knowledge of the relevant environmental sciences to be intelligent users of scientific information
- the ability to integrate knowledge from multiple disciplines in the context of complex environmental issues
- an understanding of the local, state, and federal decision processes that shape environmental issues
- the ability to think critically, creatively, and holistically about environmental issues
- the ability to work in interdisciplinary teams
- skill in communication with diverse audiences

For more information, visit the program's PhD (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/phd>) webpage.

Requirements

Required Courses

The PhD requires completion of 32 course credit hours, including two broad, introductory three-credit courses (ENVS 5000 Policy, Science, and the Environment and ENVS 5003 Theory and Methods in Environmental Studies). These courses, which are typically taken during a student's first year, are designed to expose students to the multiple fields of study that are strengths within the ENVS program and also to expose them to interdisciplinary approaches and methods to environmental problem solving.

All students must also take two semesters of ENVS Colloquium (2 course credits), a topical seminar series. Additional course work is designed to meet a student's individual needs and interests and is initially formulated during a student's Guidance Committee meeting at the beginning of their first semester.

The PhD also requires 30 hours of dissertation credits and successfully preparing and defending the doctoral dissertation.

There are five major meetings and examinations that a doctoral student must complete:

Guidance Committee Meeting

During the first six weeks of each new student's first semester (typically in the fall), a guidance committee of three faculty members will examine the student's past course record (from undergraduate and past graduate work) and devise a program of course work for that student. Responsibility for convening these meetings falls on the advisor. However, the graduate director and graduate assistant will aid in the scheduling of these meetings and, if needed, intervene to ensure they occur on schedule. These committees and their meeting should be shaped by these considerations:

- The committee should be composed of the primary advisor and at least two other faculty members. To ensure breadth of viewpoints, one member of the committee will be assigned by the Graduate Committee and will be someone outside the student's specific areas of research interest. The Graduate Committee must approve the

composition of each committee to ensure that appropriate knowledge of ENVS procedures and history are represented.

- Before the committee meeting, the student should provide a brief overview of their intellectual interests and provide an assessment of their own weaknesses and strengths in training.
- The committee, working with the student, should devise a list of both suggested and mandated courses. Course work can be specified as either a single course or a type of course (e.g., "a course covering the use of multivariate statistics," as opposed to a specific course number). In addition, the committee can suggest that the student TA certain classes as another way of exposing them to particular fields; any such suggestions should consider the feasibility of the student actually being able to TA such a course. For some areas of the program, groups of faculty have coordinated on a common set of classes for their students to take
- The assigned course work should provide the student with depth of understanding in their research field(s) and ensure that the student has some breadth of training or experience in one or more other aspects of environmental studies.
- While the number of classes suggested or mandated will vary depending on each student's past training and research plans, a typical list of required classes for a PhD student should generally not exceed six such classes.
- This first-semester guidance committee's work is finished after its one meeting, with no requirement that the members be on subsequent committees for a student.

Preliminary Examination

The first exam that a doctoral student must take is the preliminary exam, typically given in the second year of the student's program. This exam should test the student's understanding of material from the ENVS core classes, as well as the breadth and depth of their knowledge in their fields of inquiry. The ENVS preliminary exam consists of a written exam only, and must conform to the following rules:

- The committee must have at least three members and may have up to five. The Graduate Committee must approve the composition of each committee to ensure that appropriate knowledge of ENVS procedures and history are represented.
- By two months prior to the arranged exam date, committee members will provide the student with reading materials that cover both general and specific material upon which the exam will be based. It is the student's responsibility to meet with committee members and obtain these reading lists prior to the exam date, as well as to set a time for their exam. ENVS typically designates one weekend per semester as the standard dates for prelim exams, but depending on student and faculty schedules, the exam may be taken at another time if approved by the graduate director.
- The chair of the exam committee (usually the student's advisor) will assemble questions from the committee members and send them to the graduate assistant prior to the exam date. The graduate assistant will then deliver them to the student and to the graduate committee on the first day of the exam. Each committee member may mandate whether their questions are to be answered open book or closed book.
- The student will have four days to answer the questions.
- The student will deliver their answers to the graduate assistant and the committee members at the end of the exam. The committee will then have two weeks to read and score the answers. The committee will confer and decide whether the student receives a pass, fail

or conditional pass. If a fail or conditional pass is assigned, the committee may decide to allow the student to retake some or all of the exam, or to do additional work to prove sufficient competence in areas of concern.

For more information, visit the program's Preliminary Examination (<http://www.colorado.edu/envs/graduate-students/ms-phd-programs/phd/preliminary-examination>) webpage.

Prospectus Defense

The prospectus defense (also known officially as the comprehensive exam) is designed to assess a PhD student's knowledge of their research area and specifically to evaluate the student's dissertation research proposal. At the prospectus defense meeting, the committee also will review the student's completion of course work assigned in previous committee meetings. A student may advance to candidacy without completing all the formally assigned course work, with the approval of the committee.

The exam should be taken in the student's fifth semester, and no later than the sixth semester, of graduate study in ENVS. Any exceptions to this rule require the permission of the ENVS Graduate Committee. During the semester in which the student plans to defend the dissertation prospectus, an admission to candidacy application must be completed and approved by the faculty advisor and the graduate director, and submitted to the Graduate School *at least three weeks before the prospectus defense*. The Graduate Coordinator will also submit a doctoral exam report at this time to inform the Graduate School about the date of the exam and the composition of the committee.

The prospectus defense committee is made up of five people, including the student's primary advisor and four other members who are approved by the ENVS Graduate Committee and who are in a field related to the student's area of research. Three of the members must be CU Boulder graduate faculty, and one must be from outside the ENVS program. The primary advisor and outside member of the committee must have regular or tenured graduate faculty appointments. The other committee members must have either regular or special graduate faculty appointments. For committee members not on the CU Boulder faculty roster, students must submit a CV to the Graduate School and request a special appointment to the graduate faculty. Please consult the graduate coordinator (Envsgad@colorado.edu) for details.

At least two weeks before the scheduled meeting, the student must submit a research proposal to the dissertation committee on the dissertation topic. A copy of this proposal must be submitted to every member of the committee. Students are strongly encouraged to consult with committee members and particularly their advisors as they prepare this document. The research proposal should include the following categories:

- Abstract of proposed work.
- General introduction that puts the proposed project into perspective and reviews the relevant literature in the field.
- Rationale for and importance of the research.
- Relevant preliminary research already completed or in progress.
- Research design, including proposed methods and research plan.
- References (not included in page count).

This document must be limited to 15 single-spaced pages, including figures and tables, but excluding references.

The student should prepare a 20-minute formal presentation on their research progress and research plan for presentation at the exam meeting. The presentation should be of a format acceptable at a national professional meeting, highlight the questions addressed by the student's research and include sufficient details on methods to be analyzed by the committee.

At the exam meeting, the student will deliver their presentation, to be followed by a discussion of the research presented. Committee members will also probe the student's knowledge of the contemporary and historical literature related to the student's proposed research. Students are encouraged to seek advice from all prospectus defense committee members about their expectations concerning subject matter and level of knowledge for this exam. No restrictions are placed upon committee members with regard to subject matter relevant to the dissertation topic. The combination of the presentation and oral examination take approximately two hours.

Following the exam, the committee should complete the doctoral examination report, specify one of the three possible outcomes, and return it to the graduate coordinator.

- **Pass:** The student receives affirmative votes from a majority of the members of the committee. There are no additional requirements.
- **Conditional Pass:** The student is required to take additional requirements as required by the examining committee, and will not pass the exam until they complete these requirements. A conditional pass will be assigned if a student fails to demonstrate a sufficient understanding of the literature in their core research area and/or fails to articulate the motivation and design of their PhD research in either the proposal or the oral examination.
- **Fail:** The student is either asked to leave the program or to retake the prospectus defense. A student may only re-defend once.

Dissertation

A doctoral student writes a dissertation based upon original investigation, demonstrating mature scholarship and critical judgment, as well as familiarity with tools and methods of research. The subject must be approved by the student's major department.

- Generally, a PhD is comprised of main chapters that could together comprise a viable book manuscript or result in three independent papers in leading peer-reviewed journals in the student's field. Short introductory and concluding chapters that frame the work and speak to its intellectual unity and contributions are also expected of most PhD dissertations.
- Every dissertation presented in partial fulfillment of the requirements for an advanced degree must represent the equivalent of at least 30 credit hours of work.
- The student is responsible for notifying the Graduate School of the exact title of the dissertation on or before the posted deadlines during the semester in which the doctoral degree is to be conferred.
- The dissertation must comply in mechanical features with the specifications for theses and dissertations available in the Graduate School (http://www.colorado.edu/GraduateSchool/academics/doctoral_graduation_packet.html).

In addition, the following conditions must be met:

- The dissertation is filed electronically to ProQuest (<http://www.etdadmin.com/cgi-bin/school?siteId=70>) according to the Graduate School (<http://www.colorado.edu/graduateschool/current>

students) instructions by the posted deadlines in the doctoral packet (<http://www.colorado.edu/graduateschool/academics/graduation-requirements>) for the semester in which the degree is to be conferred.

- A signature page with original signatures from the chair of the student's committee and at least one other committee member must be submitted to the Graduate School by the same submission deadline.
- The survey of earned doctorates form is submitted to the National Science Foundation (<https://sed-ncses.org>) website.

The final grade for dissertation credits taken by a student is withheld until the dissertation is completed. In progress (IP) grades are assigned during each semester until the defense is successfully completed and the final copy of the dissertation is accepted by the examination committee, at which time the final grade for all dissertation hours is submitted to the Graduate School.

Dissertation Defense

The final step in a PhD is defense of the doctoral dissertation. Several steps must be followed for a valid dissertation defense meeting to be held:

- The student must be registered as a full-time, regular, degree-seeking student at CU Boulder for a minimum of 5 dissertation hours during the semester in which they pass the final examination.
- Students must notify the Graduate School of their final oral examination at least two weeks before their scheduled examination date. The examination must be scheduled no later than the posted deadline for the semester in which the degree is to be conferred. This information should be provided on the doctoral examination report and leaflet.
- This defense is wholly or partly oral, and consists of both a public presentation, open to anyone, and a closed-door meeting with the committee. This committee is appointed by the chair of the major department and approved by the dean of the Graduate School, and should consist of at least five persons, one of whom must be from outside the student's major department. Three of the members must be CU Boulder graduate faculty. The chair and outside member of the committee must have regular or tenured graduate faculty appointments. The other committee members must have either regular or special graduate faculty appointments.

Following the defense meeting, the committee votes on the outcome. More than one dissenting vote disqualifies the candidate. The committee chair and a majority of the committee must be present on the Boulder campus for the examination. A student who fails the examination may attempt it once more after a period of time determined by the examining committee.

Environment, Policy and Society - Graduate Certificate

In order to understand contemporary environmental issues, today's scholars must transcend historical academic disciplinary boundaries. Indeed, complex issues related to energy, climate change, species preservation and air and water quality are best addressed by valuing insights from multiple perspectives. The graduate certificate in environment, policy and society allows students the opportunity to engage in interdisciplinary exploration of these contemporary

environmental problems by drawing from courses across a wide range of social science disciplines.

The certificate curriculum incorporates courses from many departments in the College of Arts and Sciences, including anthropology, biology, economics, geography, philosophy, political science, psychology and sociology. In addition, pertinent courses are available in the Program in Environmental Design; the Leeds School of Business; the College of Engineering and Applied Science; the College of Media, Communications and Information; and the School of Law.

For more information, visit the Environmental Studies Program's Certificate Programs (<http://www.colorado.edu/envs/certificate-programs>) webpage.

Requirements Admission

The Graduate Certificate on Environment, Policy, and Society provides an interdisciplinary specialization for students in MA, PhD, JD, or other graduate degree programs at the University of Colorado. The program draws on courses in anthropology, economics, ecology and evolutionary biology, geography, philosophy, political science, psychology, sociology, as well as courses from other units are CU Boulder including: the Program in Environmental Design, the College of Engineering and Applied Science, the College of Media, Communications and Information, and the School of Law. The program requires 18 hours of approved courses, including a cornerstone and a capstone course.

Students must be admitted to the Certificate Program, but the only admission requirement is to be a graduate student in good standing at the University of Colorado Boulder. To be admitted, CU graduate students must complete an application form (<http://www.colorado.edu/envs/node/586/attachment>) and have it signed by an appropriate departmental representative.

A very limited number of students already holding graduate degrees from other institutions may be admitted to the program, through the Division of Continuing Education (<http://conted.colorado.edu>), by petition to the Director of the Environment, Policy and Society Program, provided their credentials are validated by one of the participating departments and meet the normal admission requirements of the department.

Program Requirements

The program requires 18 hours of approved courses, including a cornerstone and a capstone course.

To qualify for the certificate, students must complete at least 12 hours of course work from the more than 50 courses in environmental policy and policy sciences offered at CU Boulder. No more than 6 of the required 18 hours may be in the student's home department.

Of the 12 elective credit hours, nine elective credit hours must be drawn from one of four specialty areas, chosen by the student:

1. Society and the Environment
2. Environmental Policy
3. Energy and Society
4. Water and Society

The broad area of Society and the Environment has two recognized (but optional) clusters of courses, including Environment and Development and Social Dimensions of Hazards. Additional credit hours may be taken

from outside the student's area on consultation with, and approval from, the student's certificate advisor. Students who wish to incorporate a natural science course into their elective course work may also do so with the approval of the student's certificate advisor.

These degree requirements are subject to change. For updated information, visit the Environmental Studies Program's Certificate Programs (<http://www.colorado.edu/envs/certificate-programs>) webpage.

Renewable and Sustainable Energy - Graduate Certificate

The RASEI graduate renewable energy certificate equips students across graduate degree programs with skills and knowledge that transcend traditional disciplines and establish a firm grounding in the business, policy, economic, and institutional aspects of energy. We couple a required core of science and technology, policy, and business courses with electives specific to each student's degree program to produce experts with both depth in the energy aspects of their disciplines and the breadth to work across sectors and knowledge communities to drive transformation of the global energy system.

Solving the global challenge of energy transition is not just a technical challenge, and requires contributions from a variety of approaches.

Thus no specific disciplinary background is required, and our program draws from the business school, the humanities, journalism, the sciences, engineering, and law. This graduate certificate program is intended to supplement, not replace, graduate students' degree programs. Graduates from this certificate program - whether they have JDs, MBAs, masters degrees, or doctorates—will have a strong understanding of energy systems, energy alternatives, energy markets and business, and energy policy. Most importantly, the certificate program connects emerging experts in energy with one another, and creates a transdisciplinary community of energy students that reach across colleges and departments on campus.

Distance Education

Students can complete some requirements for this graduate certificate via distance education (online). For more information, connect with the graduate program advisor or visit the RASEI web site (<http://www.colorado.edu/rasei/education/programs-graduate-students/graduate-energy-certificate-program>).

Requirements

Students must earn a grade of C or higher in all required courses and complete three energy or climate-related elective classes. For a list of pre-approved electives, consult the RASEI web site (<http://www.colorado.edu/rasei/education/energy-related-courses-0>).

Required Courses

ENST 5000	Energy Systems and Technologies	3
ENST 5001	Energy Policy in the 21st Century	3
ENST 5002	The Business of Sustainable Energy	3

Science and Technology Policy - Graduate Certificate

The graduate certificate in science and technology policy is a rigorous educational program to prepare students pursuing graduate degrees

for careers at the interface of science, technology and decision making. Past recipients of the certificate have gone on to positions in the U.S. Congress, academia, NOAA and other policy relevant positions.

Students come from such graduate programs as:

- aerospace engineering
- atmospheric and oceanic sciences
- biological sciences
- chemistry
- civil engineering
- environmental studies
- geography
- journalism
- mechanical engineering

Students enrolled receive either a master's or doctoral degree in their department and a certificate in science and technology policy. Each year, the certificate program will begin with a capped enrollment of 18 students per cohort.

Requirements

Successful completion of the certificate program requires the completion of 18 credit hours of course work (or course work plus internship credit hours) to include three required courses and three additional courses selected from a list of approved electives.

Required Courses and Semester Credit Hours

Required Courses

ENVS 5100	Special Topics in Environmental Studies (Science and Technology Policy)	3
ENVS 5110	Topics in Environmental Social Science and Humanities (Science, Technology, and Society)	3
ENVS 5120	Topics in Quantitative Methods (Quantitative Methods of Policy Analysis)	3

Electives

Select three additional courses from the program's list of approved electives. ¹	9
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Total Credit Hours	18
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¹ For a list of approved electives, visit the center's Certificate Courses (<http://sciencepolicy.colorado.edu/stcert/curriculum/courses.html>) webpage.

For more information, visit the center's Graduate Certificate Program in Science and Technology Policy (<http://sciencepolicy.colorado.edu/stcert>) webpage.

Ethnic Studies

The field of Ethnic Studies was born out of, and is dedicated to, struggles for social justice for all people. The Department of Ethnic Studies at the University of Colorado Boulder draws on this tradition of engaged scholarship to examine how race and the interrelated categories of ethnicity, gender, class, and sexuality impact the lives of people in the United States and around the globe.

Our interdisciplinary department offers a doctoral degree and a graduate certificate in comparative ethnic studies. Faculty members engage in a wide variety of research on the cultures, histories, epistemologies, and

experiences in African American, Asian American, Chicana and Chicano, and Native American peoples in the U.S. and beyond. Their research and teaching address these topics through critical, transnational, queer, decolonial and comparative perspectives.

Course code for this program is ETHN.

Doctoral Degree

- Comparative Ethnic Studies - Doctor of Philosophy (PhD) (p. 982)

Certificate

- Comparative Ethnic Studies - Graduate Certificate (p. 983)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aldama, Arturo James (https://experts.colorado.edu/display/fisid_130739)

Associate Professor; PhD, University of California-Berkeley

Belknap, Joanne Elizabeth (https://experts.colorado.edu/display/fisid_113617)

Professor; PhD, Michigan State University

Carroll, Clinton R (https://experts.colorado.edu/display/fisid_154726)

Assistant Professor; PhD, University of California-Berkeley

Holmes, Kwame Alfred (https://experts.colorado.edu/display/fisid_152870)

Assistant Professor; PhD, University of Illinois at Urbana-Champaign

King, William M.
Professor Emeritus

Lawson, Angelica Marie (https://experts.colorado.edu/display/fisid_154727)

Assistant Professor; PhD, University of Arizona

Maeda, Daryl Joji (https://experts.colorado.edu/display/fisid_141460)

Associate Professor; PhD, University of Michigan Ann Arbor

Medak-Saltzman, Danika Fawn (https://experts.colorado.edu/display/fisid_145844)

Assistant Professor; PhD, University of California-Berkeley

Perez, Emma Marie (https://experts.colorado.edu/display/fisid_130962)

Professor; PhD, University of California-Los Angeles

Potter, Hillary A (https://experts.colorado.edu/display/fisid_124938)

Associate Professor; PhD, University of Colorado Boulder

Rabaka, Reiland Devaun (https://experts.colorado.edu/display/fisid_141463)

Professor; PhD, Temple University

Sohi, Seema (https://experts.colorado.edu/display/fisid_144616)

Associate Professor; PhD, University of Washington

Walker, Deward
Professor Emeritus

Williams, Bianca Christel (https://experts.colorado.edu/display/fisid_147342)

Associate Professor; PhD, Duke University

Withycombe, Jenny Lind (https://experts.colorado.edu/display/fisid_153354)

Instructor; PhD, University of Tennessee-Knoxville

Courses

ETHN 5001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland

Engaging with the ways in which race, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4001 and FILM 4001

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 5102 (3) Special Topics in Africana Studies

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4102

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Africana Studies

ETHN 5106 (3) Special Topics in Chicana and Chicano Studies

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4106

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 5272 (3) W.E.B. Du Bois Seminar

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4272

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Africana Studies

ETHN 5306 (3) The Chicana and Chicano and U.S. Social Systems

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4306

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 5353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4353 and RLST 4353 and RLST 5353

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 5552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4552 and HUMN 4552

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Africana Studies

ETHN 5553 (3) Indigenous Representations in the United States

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4553

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American Indian Studies

ETHN 5632 (3) Frantz Fanon Seminar

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4632

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Africana Studies

ETHN 5714 (3) Sport and Social Justice

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4714

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 5951 (3) Senior/Graduate Seminar in Ethnic Studies

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4951

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6000 (3) Foundations of Comparative Ethnic Studies

Examines theories of race, ethnicity, gender, sexuality, colonialism and globalization, especially from the perspectives of communities most impacted by these categories and processes. This is the introductory course for graduate work in Comparative Ethnic Studies.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6001 (3) Research Methods in Comparative Ethnic Studies

Examines various humanistic and social science research methodologies and applies critical frameworks (including feminist, queer, Indigenous and decolonial theories) to research through an intersectional lens committed to analyzing race, class, gender and sexuality as interconnected, knowledge-producing systems of power. Examines how Ethnic Studies scholars can engage with social justice projects by producing knowledge in cutting edge ways.

Requisites: Requires prerequisite course of ETHN 6000 (minimum grade C). Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6002 (1) Professionalization Seminar in Comparative Ethnic Studies

Provides graduate students with professionalization skills, including how to prepare a national fellowship application, how to give a successful job talk, how to publish refereed journals and book volumes and how to approach the academic job market.

Requisites: Restricted to Ethnic Studies (ETHN) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6011 (3) Race and Sexuality Studies

Examines primary texts in queer studies and queer theory while challenging colonial heteronormative and homonormative studies that exclude queers of color and their life experiences. Readings include works by Gloria Anzaldua, Jose Munoz, Audre Lorde, David Eng, Judith Butler, Judith Halberstam, and Michel Foucault. Topics such as queer borderlands, citizenship, racialized and transgender identities will be interrogated.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6014 (3) Gender, Race, Class, and Crime

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 7014

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6100 (3) Race and Citizenship in U.S. History and Culture

Examines how the cultural and legal bounds of U.S. citizenship have been linked to race, gender, labor, class, and sexuality. Analyzes the experiences of racialized and gendered groups to explore the racial formations, exclusions and contradictions inherent with the institution of citizenship.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6101 (1-6) Topics: Specialized Comparative Studies

Focuses on a variety of advanced interdisciplinary studies. Themes include: Race and Sports, Critical Whiteness Studies, Race and Masculinity, Applied Community Engagement, Black Women in the Diaspora, US/Mexico Border Cultures, Criminalization and Latinas/os, Race, Violence and Film, and Cuba and Tourism.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Requisite ETHN coursework.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6103 (3) Indigenous Thought and Theory: Foundations in NAIS

Introduces the theoretical landscapes of Native American and Indigenous Studies. Explores debates, methodologies and concerns that ground the field and provides critical engagement with Indigenous communities and knowledges. Teaches standards for evaluating scholarly sources based on criteria derived from the most outstanding recent scholarship in the field. Requires writing and thinking critically about issues of concern for global indigenous communities.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American Indian Studies

ETHN 6110 (3) Adv. Tpcs. In Chicana/Chicano Studies: US/Mexico Borderlands

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

Equivalent - Duplicate Degree Credit Not Granted: RLST 6110

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Chicana/o Studies

ETHN 6301 (3) Decolonial/Postcolonial Theory

Offers an overview of the origins and evolution of Decolonial/Postcolonial Theory. Critically compares and contrasts decolonial discourse with postcolonial theory. Exposes students to the ways in which decolonial and postcolonial theory conceptually interconnect via Cultural Studies, Critical Race Studies and Ethnic Studies-derived discourses such as racial colonialism, the critique of European imperialism, transnationalism feminism, Indigeneity/Indigenous Studies, Diaspora Studies and Subaltern Studies.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6501 (3) Critical Race Theory: Soc Scnc Explrtn/Intrvntn into Crit Race St

Offers an overview of the origins and evolution of Critical Race Theory (CRT). Critically compares and contrasts legal and extralegal social science approaches to CRT. Exposes students to the ways in which CRT and Critical Ethnic Studies conceptually interconnects via CRT-derived discourses such as Critical Race Feminism, Critical White Studies, TribalCrit, LatCrit, AsianCrit, DesiCriti, QueerCrit and Decolonial/Postcolonial Critical Race Theory.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6841 (1-6) Advanced Directed Readings in Ethnic Studies

This is a graduate level directed readings course designed to expand student knowledge in a particular area of concentration with a broad interdisciplinary and comparative framework. These areas of concentration include work in Africana, American Indian, Asian American, Chicana and Chicano and Transnational/Hemispheric ethnic studies.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for a minimum of 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

Comparative Ethnic Studies - Doctor of Philosophy (PhD)

The PhD program in comparative ethnic studies offers an innovative and streamlined path to provide students with broad training to enable them to research and analyze the intersectional and relational workings of race, ethnicity, gender, class and sexuality in national and transnational contexts. It provides flexibility for students to pursue their individual research interests, while ensuring that they are grounded in both the foundational and cutting-edge theories in ethnic studies.

The department is dedicated to interrogating the relational nature of race and its attendant categories, particularly gender and sexuality, using frameworks that account for the increasingly transnational ways that these categories are constructed, resisted and inhabited. However, we believe that rigorous comparative and relational analyses can only grow out of deep groundings in the particular areas of Africana, Asian American, Chicana and Chicano, and Native American/Indigenous studies. Methodologically and theoretically, our faculty members possess training and expertise in interdisciplinary fields, including ethnic studies, women's and gender studies, cultural studies, literary and film studies, border studies and American studies, as well as traditional disciplines, including anthropology, history, philosophy and sociology.

Requirements

Doctoral students are expected to demonstrate an ability to independently carry out original field research, acquire original data, make

appropriate analyses and prepare reports of publishable caliber. Students must demonstrate proficiency in a broad subject of learning and the ability to critically evaluate work in ethnic studies. The PhD program is comprised of three basic components: course work, a comprehensive examination and the dissertation.

A master's degree in ethnic studies or a cognate field (e.g., American studies, English, history, sociology, women's and gender studies, or other related disciplines and interdisciplinary fields) from an accredited university is required for admission into the PhD program.

Transfer of Credit

The associate chair for graduate studies (ACGS), in consultation with the Graduate Committee (GC), will examine the academic transcripts of admitted students to determine transfer credits where appropriate.

Students will be permitted to transfer up to a maximum of 9 credit hours. Students must submit a syllabus for each course to be considered for transfer, and will require the approval of the ACGS.

Course and Credit Requirements

Students must complete 60 credit hours, with a minimum of 30 credit hours of graduate-level course work (including any transferred graduate credit from the completed master's degree referenced above). At least 18 of the 30 credit hours of graduate-level course work must come from the Department of Ethnic Studies.

The subfield requirement (see below) must be fulfilled by completing a minimum of 9 credits of coursework in a department outside of Ethnic Studies (transferred graduate credit may be used to satisfy this requirement).

In addition to the 30 credit hours of graduate-level course work, students must complete a minimum of 30 dissertation credits in total: 5–10 during comprehensive examination preparation and 5–10 per semester when defending the prospectus and writing the dissertation. Students must be registered for a minimum of five dissertation hours the semester (including summer semester) in which the comprehensive exam/dissertation defense is held. Students are not permitted to register for more than 10 credit hours of dissertation credit per semester, per Graduate School rules.

Continuous Registration

A PhD student is required to register continuously as a full-time, regular degree-seeking student at CU Boulder for a minimum of five credit hours in the fall and spring semesters of each year. Students must be registered for a minimum of 5 dissertation hours per semester beginning with the semester following the passing of the comprehensive examination and extending through the semester in which the dissertation is successfully defended (final examination). A student who fails to register continuously after passing the comprehensive examination must retake and pass the examination to regain status as a student in good standing in the Graduate School.

Course Requirements

All doctoral students are required to complete the fall and spring sequence, ETHN 6000/ETHN 6001: Foundations in Comparative Ethnic Studies and Methods in Comparative Ethnic Studies (6 credits total, 3 per semester). The introductory, two-semester course will prepare doctoral students for interdisciplinary studies on race, ethnicity, gender, class, indigeneity, sexuality, nation and culture. The first semester will be a

theoretical introduction, and the second semester will examine research methodologies and application of theories to research.

In addition to the two introductory courses, students will be required to enroll in a 1-credit professionalization seminar (ETHN 6002), which is a two-semester course offered by the Ethnic Studies Department that meets once a month during the academic year.

The remaining 23 credits will be selected in consultation with the student's advisor from among ETHN graduate offerings, graduate courses in other units, and approved transfer credit up to 9 credit hours.

Subfield Requirement

The subfield requirement entails completing a minimum of 9 credits of graduate-level course work in a department outside of Ethnic Studies (transferred credits may be used to satisfy this requirement). Depending on their research interests, students will select, in consultation with their advisor and the ACGS, either a *thematic* or *disciplinary* subfield. Disciplinary subfields can be chosen from cognate units including, but not limited to, history, sociology, economics, English, anthropology, religious studies, women's and gender studies, humanities, communication, film, philosophy, political science, geography and art history. Thematic subfields allow students to select courses from departments outside of Ethnic Studies that relate to a thematic framework (e.g. postcolonialism and empire, diaspora and labor migration, etc.). Students will be advised by their advisor and the ACGS about their subfields, which will be highly individualized to suit the student's particular research interests.

Language Requirement

The department encourages, but does not require, foreign language proficiency, especially for students conducting research in sources other than English. Proficiency will be demonstrated by passing (with a grade of C or better) the fourth semester of a foreign language course, earning a passing score on the Graduate School foreign language test, or by an alternative mode of assessment agreed to by the Graduate Committee. Credits earned for language proficiency will not apply toward the doctoral degree. The goals of the language requirement are to ensure that doctoral scholars can research materials in other languages besides English. The department will work with the Graduate School to ensure that the language requirements are in parity with other interdisciplinary doctoral programs at CU Boulder.

For additional details, visit the department's PhD Program (http://www.colorado.edu/ethnicstudies/grad/phd_program.html) webpage and download the Graduate Student Handbook.

Comparative Ethnic Studies - Graduate Certificate

The 12-credit graduate certificate in comparative ethnic studies is an interdisciplinary course of study designed to complement the MA or PhD curriculum required by the student's home department within CU Boulder. The Department of Ethnic Studies (DES) offers the certificate to provide specialized training in Africana studies, Chicana/o studies, decolonial feminist studies, comparative ethnic studies, race and sexuality studies, and transnational/hemispheric ethnic studies to students pursuing degrees in various disciplines on campus.

Requirements

Application Requirements

Students must submit an unofficial transcript and a two-page statement of purpose describing how their graduate interests will be enhanced by our course offerings and mentoring (in the statement of purpose, please identify classes already taken in DES).

To participate in the ethnic studies certificate program, applicants must maintain good academic standing with their home unit within the Graduate School. Their home unit must also indicate its support for the student enrolling in the certificate program.

Materials should be sent to grad.ethnst@colorado.edu.

Course Requirements

A total of 12 credit hours of graduate-level course work is required for this certificate, nine of which must be from courses in the Department of Ethnic Studies (ETHN 6000 and two electives). Certificate program students must maintain a minimum GPA of 3.3.

Required Courses and Semester Credit Hours

Required Course

ETHN 6000	Foundations of Comparative Ethnic Studies	3
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Electives

Choose three graduate-level electives, at least two of which are from the Department of Ethnic Studies. Approved elective courses include:

ETHN 5001	Screening Race, Class & Gender in the U.S. and the Global Borderland	9
ETHN 5102	Special Topics in Africana Studies	
ETHN 5106	Special Topics in Chicana and Chicano Studies	
ETHN 5272	W.E.B. Du Bois Seminar	
ETHN 5306	The Chicana and Chicano and U.S. Social Systems	
ETHN 5353	Indigenous Traditions and Law: A Global Perspective	
ETHN 5552	The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop	
ETHN 5553	Indigenous Representations in the United States	
ETHN 5632	Frantz Fanon Seminar	
ETHN 5714	Sport and Social Justice	
ETHN 5951	Senior/Graduate Seminar in Ethnic Studies	
ETHN 6001	Research Methods in Comparative Ethnic Studies	
ETHN 6011	Race and Sexuality Studies	
ETHN 6014	Gender, Race, Class, and Crime	
ETHN 6100	Race and Citizenship in U.S. History and Culture	
ETHN 6101	Topics: Specialized Comparative Studies	
ETHN 6103	Indigenous Thought and Theory: Foundations in NAIS	
ETHN 6110	Adv. Tpcs. In Chicana/Chicano Studies: US/Mexico Borderlands	
ETHN 6301	Decolonial/Postcolonial Theory	
ETHN 6501	Critical Race Theory: Soc Scnc Explrtn/Intrvntn into Crit Race St	
ETHN 6841	Advanced Directed Readings in Ethnic Studies	

Total Credit Hours 12

French and Italian

The Department of French and Italian at the University of Colorado Boulder enjoys a national reputation, and is the only PhD granting department in the Rocky Mountain region. The department offers comprehensive coverage of all areas of French and Francophone literature, and has an outstanding record of placing its MA and PhD recipients in desirable positions of employment. The graduate program typically counts an enrollment of 20 to 25 students, drawn from both the U.S. and several foreign countries, pursuing interests from the Middle Ages to 20th c. and Francophone literatures.

Graduate Study in French

The Department of French and Italian at the University of Colorado Boulder offer master's and doctoral French graduate programs. Students wishing to pursue graduate work in French leading to candidacy for an advanced degree should read the Degree Requirements (p. 866) sections carefully.

Master's Degree

- French - Master of Arts (MA) (p. 986)

Doctoral Degree

- French - Doctor of Philosophy (PhD) (p. 987)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ardizzoni, Michela (https://experts.colorado.edu/display/fisid_145152)
Assistant Professor; PhD, Indiana University Bloomington

Barchilon, Jacques
Professor Emeritus

Bloomfield, Elisabeth Marie Arnould (https://experts.colorado.edu/display/fisid_125576)
Associate Professor; PhD, University of California-San Diego

Braider, Christopher (https://experts.colorado.edu/display/fisid_100300)
Professor; PhD, Trinity College, Dublin (Ireland)

Corda, Giorgio (https://experts.colorado.edu/display/fisid_151173)
Instructor; MA, University of Venice (Italy)

Craven, Priscilla (https://experts.colorado.edu/display/fisid_108033)
Senior Instructor; MA, University of Colorado Boulder

Ferre, Valerio C (https://experts.colorado.edu/display/fisid_113064)
Professor; PhD, University of California-Berkeley

Frey, Julia B.
Professor Emeritus

Lazarino, Graziana
Professor Emeritus

Magnanini, Suzanne M. (https://experts.colorado.edu/display/fisid_118145)
Associate Professor; PhD, University of Chicago

Mayer, Edgar N.
Professor Emeritus

Mortimer, Mildred
Professor Emeritus

Motte, Warren F (https://experts.colorado.edu/display/fisid_100001)
Professor; PhD, University of Pennsylvania

Murphy, Kieran Marcellin (https://experts.colorado.edu/display/fisid_152976)
Assistant Professor; PhD, University of California-Santa Barbara

Quinn, Brian Dennis (https://experts.colorado.edu/display/fisid_155973)
Assistant Professor; PhD, University of California-Los Angeles

Seno, Cosetta (https://experts.colorado.edu/display/fisid_144515)
Associate Professor; PhD, University of California-Berkeley

Torriani, Chiara (https://experts.colorado.edu/display/fisid_132725)
Instructor

Trifunovic, Danica (https://experts.colorado.edu/display/fisid_114084)
Instructor

Van Nelson, Loredana Alina (https://experts.colorado.edu/display/fisid_142722)
Instructor

Yamashita, Masano (https://experts.colorado.edu/display/fisid_147343)
Assistant Professor; PhD, New York University

Courses

No Italian courses are offered at the graduate level.

FREN 5110 (3) French Special Topics

Different topics are offered and, in a number of cases, cross-listed with other departments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5120 (3) French Special Topics

Different topics are offered and, in a number of cases, cross-listed with other departments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5170 (3) Francophone African Literature

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5250 (3) Medieval and Renaissance Readings

Through close readings of masterpieces of French medieval and Renaissance literature in conjunction with contemporary criticism and theory, explores the contexts of medieval and Renaissance France. Readings in French. May be taught in English to accommodate students in other programs.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5310 (3) 17th Century French Tragedy and Poetry

Close readings of tragedies by (among others) Corneille and Racine, placed in the context of baroque and neoclassical political and artistic culture as illustrated by philosophy, painting, and science. Drawing on recent criticism and theory, explores heroic drama's role as a symptom and agent of early modern French social and intellectual history. Readings in French, but may be taught in English.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5320 (3) 17th Century French Prose

Close readings of major works by, e.g., Descartes, Pascal, La Fayette, La Rochefoucauld, and La Bruyere. Themes include 17th century theories of self, early modern epistemology, notions of honnetete and the critical analysis of human motives and behavior, the emerging novel, and the critique of heroic idealism and of the monarchic absolutism of the Sun King, Louis XIV. Readings in French, but may be taught in English.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5330 (3) Moliere and 17th Century French Comedy

Close readings of the comedies in context with the works of, e.g., Corneille, Rotrou, Cyrano, Boileau, and La Fontaine. Themes include Moliere and the institution of literary authorship, comedy's role as social critique, the deconstruction of the early modern subject, and the cultural politics of the scandals surrounding L'ecole des femmes and Tartuffe. Readings in French, but may be taught in English.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5350 (3) French Enlightenment

Focuses on the uses of literature to address the revolutionary philosophical, scientific, religious, and/or sociopolitical questions of the day. Explores Diderot and d'Alembert's Encyclopedie, Voltaire and Diderot's philosophical tales and dialogues, Rousseau's Discours, and other writings. Discusses the development of specific literary forms to promote the ideas and goals of the philosophers to reach a changing and diverse readership and to fight censorship.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5360 (3) 18th Century French Literature

Focuses on the study of a specific literary genre (e.g., theatre, the novel) or on the global production of a major author (e.g., Voltaire, Diderot, Rousseau). Discussion stresses both the uniqueness of the genre/ writer and their significance as representatives of the century's changing society and culture.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5420 (3) 19th Century French Literature

A survey of principal works and movements, intended as an introductory course.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5430 (3) Topics in 19th Century French Prose, Poetry, and Theatre

Topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5440 (3) Literary Ludics

Taught in French and English. Focuses on literary structures proposed by author to reader as games. Considers critical texts, both practical and theoretical, with a view toward defining the relation between criticism and its objects.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5470 (3) 20th Century French Theatre and Poetry

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5770 (2-3) Methods of Teaching French as a Foreign Language

Familiarizes students with current methodology and techniques in foreign language teaching.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 6840 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

French - Master of Arts (MA)

The MA program in French literature at CU Boulder consists of course work and a comprehensive examination.

Concurrent Degree Program

BA/MA in French

The department also administers a concurrent undergraduate and graduate degree program in French, offering students the opportunity to graduate with a BA and an MA in French in five years. Students interested in this program should consult a college advisor and the associate chair for graduate studies for details. Students should also read the relevant guidelines available in the main department office.

Requirements

Prerequisites

The following are prerequisite to graduate study in French: an undergraduate major in French or its equivalent with a grade average of at least B in all French courses; the ability to read, write, speak and understand spoken standard French; general knowledge of French literature and civilization; and ability to read one language in addition to English and French. This last requirement may be fulfilled by passing a reading examination offered by the department.

Program Requirements

Degree requirements are subject to change. Students wishing to pursue graduate work in French should visit the department's MA Guidelines (<http://www.colorado.edu/frenchitalian/graduate/ma-guidelines>) for the most up-to-date degree requirements.

Course Requirements

The following summary of minimum requirements is expressed in terms of courses. Each course represents a graduate seminar carrying two or three credit hours. Additional course work may be required by the director of graduate studies.

Students and their administrators are equally responsible for making certain that their graduate curriculum satisfies all graduation requirements, both those of the department and those of the Graduate School. Every student should accordingly become thoroughly familiar with the Master's Degree Requirements (p. 866) section of this catalog.

Required Courses

At least eight courses (5000-level or above) in French literature and culture. Students must take at least one course in seven of the eight major historical periods of French literature: Middle Ages, 16th, 17th, 18th, 19th, 20th centuries, Francophone literature, and film.	24
Up to two courses (4000-level or above) in a related field (e.g., comparative literature, English, Spanish, classics, linguistics, film studies, history, fine arts, education) to be determined in consultation with the director of graduate studies. ¹	6
FREN 5770 Methods of Teaching French as a Foreign Language	3
Total Credit Hours	33

¹ *Students planning to apply for the doctoral program should remember that PhD candidates are expected to take three courses in a related field at the 5000 level or above. Courses in a related field at the 4000 level will normally not count toward this total.*

Master's students are normally not allowed to take independent studies courses. However, in exceptional circumstances, and with the approval of the director of graduate studies, they may register for one and at the very most two such courses.

Language Requirement

All MA candidates must acquire a reading knowledge of a language other than French and English. The language should be related to the student's academic program. The requirement may be fulfilled by taking a translation exam offered by the department in the language in question or by passing course work either at CU or prior to arrival on campus equivalent to a fourth semester (2120 at CU) college course.

Early in their first semester in the MA program, each student should meet individually with the director of graduate studies to discuss their overall plan of study, including the ways in which they will satisfy the language requirement.

MA Comprehensive Examination

This examination will be based on a reading list in literature, culture and theory prepared by the graduate faculty. It will be administered by an examination committee composed of the director of graduate studies and two other members of the graduate faculty, appointed by the chair. The examination will consist of three essays of three hours each, based on questions formulated by the examination committee, and a one-hour oral examination designed to test the student's knowledge of the reading list. Normally the three essays will be written within a six-day period, and the one-hour oral exam will normally follow within two weeks. Two of the three essays must be written in French, but should students decide to exercise the option of writing one in English, they are entirely free to choose which one it shall be. The comprehensive examination must be taken during the fourth semester of the MA program.

Typical Two-Year MA Program Structure

The MA degree is intended to be completed in two years. The normal pattern of courses would be as follows:

Course	Title	Credit Hours
Year One		
Fall Semester		
Two seminars		6
FREN 5770	Methods of Teaching French as a Foreign Language	3
	Credit Hours	9
Spring Semester		
Three seminars		9
	Credit Hours	9
Year Two		
Fall Semester		
Three seminars		9
	Credit Hours	9
Spring Semester		
Two seminars		6
	Credit Hours	6
	Total Credit Hours	33

French - Doctor of Philosophy (PhD)

The Department of French and Italian at CU Boulder enjoys a national reputation and is the only PhD-granting department in the Rocky Mountain region. The department offers comprehensive coverage of all areas of French and Francophone literature, and has an outstanding record of placing its PhD recipients in desirable positions of employment. Our students pursue interests from the Middle Ages to 21st-century and Francophone literatures.

Requirements

Prerequisites

Doctoral candidates should possess excellence in reading, speaking, writing and understanding spoken standard French; general knowledge of French literature and civilization; and knowledge of one language other than English and French.

Program Requirements

The PhD program in French literature consists of a) course work, b) a comprehensive examination, c) a doctoral dissertation, and d) an oral defense of the doctoral dissertation.

Degree requirements are subject to change. Students should visit the department's PhD Guidelines (<http://www.colorado.edu/frenchitalian/graduate/phd-guidelines>) webpage for the most up-to-date degree requirements.

Required Courses and Semester Credit Hours

The following summary of minimum requirements is expressed in terms of courses. Additional course work may be required by the director of graduate studies.

Students and their administrators are equally responsible for making certain that their graduate curriculum satisfies all graduation requirements, both those of the department and those of the Graduate School. Every student should accordingly become thoroughly familiar with the Doctoral Degree Requirements (p. 867) section of this catalog.

Required Courses

At least 12 courses (5000-level and above) in French literature and culture.	36
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Up to three courses (4000-level or above) in a related field (e.g., comparative literature, English, Spanish, classics, linguistics, Romance linguistics, film studies, history, fine arts, education) to be determined in consultation with the graduate advisor.	6-9
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Total Credit Hours	42-45
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PhD students are normally allowed to take two independent studies courses, subject to the approval of the director of graduate studies. However, they may not take more than two (including any taken at the Master's level) except in exceptional circumstances and with the approval of the director of graduate studies.

Students must also have taken at least one course (5000-level and above) in seven of the eight major periods of French literature: Middle Ages, 16th, 17th, 18th, 19th, 20th centuries, Francophone literature, and film. Students continuing from the MA program at CU will normally have fulfilled this requirement as part of their MA degree.

Students entering the PhD program with an MA in French or equivalent from another university can count five of their previous MA courses toward the 15-course requirement; they must take 10 courses during the first two years of candidacy, up to two of which may be in a related field. Such students must take courses covering four of the eight periods of French literature. Previous course work will be evaluated, and if at least seven of the periods were not covered at the MA level, courses will be required to attain this coverage.

In summary, for students entering from other MA programs, the requirements are: 1) at least four courses within the department to cover four time periods, with these at the candidate's discretion except for the requirement to cover gaps from the MA program; 2) up to two courses in related fields; 3) four additional courses within the department at the discretion of the student.

Students entering the PhD program without an MA in French must consult with the director of graduate studies.

Language Requirement

A sound reading knowledge of one modern language other than English and French is required. Such reading knowledge must be certified by the student passing a reading examination in the language. The examination normally consists of a timed translation of a literary text or a text dealing with literature (e.g., literary criticism). A dictionary is permitted. This language should be relevant to the student's academic program.

Examination/PhD Comprehensive Examination

As students are finishing their required course work, they should have a good idea of the way their courses and ideas are coalescing around a given general field and a specific problem within that field. Courses taken

outside the department, as well as work in the related field, should fit into this pattern.

As this specification of interest toward the area of the dissertation takes place, the student should constitute a doctoral committee consisting of five graduate faculty members (one of whom must come from outside the student's department) who will guide the student's work. One of these faculty members will serve as the director and take responsibility for coordinating the work of this ad hoc doctoral committee.

Once the doctoral committee is formed and approved by the Graduate School, the student will begin to prepare for the PhD comprehensive examination. The examination will consist of one substantial essay (the equivalent of a 30-page seminar paper) followed by an oral. The subject of the essay is expected to evolve from one of three areas of concentration leading to the dissertation topic, or from a synthesis of these areas. A fairly common example of three such areas is: a major author (e.g., Flaubert), a major historical period (e.g., the second half of the 19th century) and a theoretical or thematic question (e.g., the realist novel). Normally, the question of the exam should have a theoretical or transhistorical orientation which extends beyond the immediate subjects of the two other areas. For each of the areas, the student will work with a member of the doctoral committee who will direct the development of a comprehensive reading list adequately preparing the student to undertake a significant original research project in the given dissertation area.

Once the student has completed the preparation for the examination by mastering the material contained in the three reading lists, the first part of the examination will consist of one extensive essay written in response to a question formulated by the doctoral committee on the three general areas. The student will have two weeks to write the essay. Once this essay is written, the doctoral committee will conduct the oral part of the examination as a discussion on material covered in the essay, as well as material not covered but related to the three areas of concentration leading to the dissertation topic.

Normally the PhD exams should be taken at the end of the student's second year in the program (for students continuing from CU's MA program) or at the end of the third year in the program (for students entering from other MA programs). In both cases, this allows the student a full year of independent study after the conclusion of course requirements.

Following successful completion of the comprehensive examination, working with the doctoral committee as a whole, the student will develop a dissertation prospectus setting forth the research subject. Upon successful completion of the PhD exams, students normally spend the next two years writing a dissertation (their third and fourth years in the PhD program, or fourth and fifth years for those entering with an external MA).

PhD Dissertation

The PhD dissertation must be based upon original investigation and demonstrate mature scholarship and critical judgment as well as familiarity with the tools and methods of research. It should be a worthwhile contribution to knowledge in the student's special field. Students are expected to have submitted an approved thesis prospectus by the end of the semester following their PhD comprehensive exams. Students are advised to familiarize themselves thoroughly with the various Graduate School rules governing the format and deadlines for the dissertation. The dissertation is normally written in English, and all departures from this norm must be approved by the student's committee.

Oral Defense of the Dissertation

After the dissertation has been accepted, a final oral examination on the dissertation and related topics will be held. The examination will be conducted by a five-member committee, appointed by the dean of the Graduate School, which will consist of representatives of areas in which the student has worked. At least one member of the committee will be from outside the student's field of study. The committee should be approved by the Graduate School at least two weeks prior to the oral defense. More than one negative vote will disqualify the candidate in the oral defense.

Graduate Program Structure

Typical Six-Year Structure for Entering MA Students

The PhD degree is intended to be completed in six years. The MA would normally be awarded after two years in the program. The standard sequence of courses is as follows:

Course	Title	Credit Hours
Year One		
Fall Semester		
Two seminars		6
Supervised teaching		
	Credit Hours	6
Spring Semester		
Three seminars		9
	Credit Hours	9
Year Two		
Fall Semester		
Three seminars		9
	Credit Hours	9
Spring Semester		
Two seminars		6
MA comprehensive exam		
	Credit Hours	6
Year Three		
Fall Semester		
Three seminars		9
	Credit Hours	9
Spring Semester		
Two to three seminars		6-9
	Credit Hours	6-9
Year Four		
Fall Semester		
Five hours of dissertation guidance		5
	Credit Hours	5
Spring Semester		
Five hours of dissertation guidance		5
PhD comprehensive exam		
	Credit Hours	5
Year Five		
Fall Semester		
At least five hours of dissertation guidance		5

Submission of dissertation prospectus	Credit Hours	5
Spring Semester		
At least five hours of dissertation guidance	Credit Hours	5
Year Six		
Fall Semester		
At least five hours of dissertation guidance	Credit Hours	5
Spring Semester		
At least five hours of dissertation guidance	Credit Hours	5
Submission and oral defense of dissertation	Credit Hours	5
		Total Credit Hours
		75-78

Typical Five-Year Structure for Students Who Hold an MA in French from Another Institution

The standard sequence of courses is as follows:

Course	Title	Credit Hours
Year One		
Fall Semester		
Two to three seminars		6-9
		Credit Hours
		6-9
Spring Semester		
Three seminars		9
		Credit Hours
		9
Year Two		
Fall Semester		
Three seminars		9
		Credit Hours
		9
Spring Semester		
Two to three seminars		6-9
		Credit Hours
		6-9
Year Three		
Fall Semester		
Five hours of dissertation guidance		5
		Credit Hours
		5
Spring Semester		
Five hours of dissertation guidance		5
PhD comprehensive exam		5
		Credit Hours
		5
Year Four		
Fall Semester		
At least five hours of dissertation guidance		5
Submission of dissertation prospectus		5
		Credit Hours
		5
Spring Semester		
At least five hours of dissertation guidance		5
		Credit Hours
		5

Year Five

Fall Semester

At least five hours of dissertation guidance	Credit Hours	5
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Spring Semester

At least five hours of dissertation guidance	Credit Hours	5
Submission and oral defense of dissertation	Credit Hours	5
		Total Credit Hours
		60-66

Geography

The Geography Department offers theoretical and applied work in human geography, environment and society geography, physical geography, and geographic information science. Each subfield covers a broad range of topics. Human geography includes political, cultural, development, feminist, population, and urban geography. Environment and society geography includes political ecology, natural hazards, and conservation practice. Physical geography includes climatology, geomorphology, hydrology, and biogeography. Geographic information science includes spatial analysis using GIS, remote sensing, and cartography. The Department also offers regionally focused courses on mountain geography and geographies of China, Latin America, Africa, and South Asia. To complement its curriculum, the Department also offers internship opportunities for geography majors.

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read carefully the requirements for advanced degrees in the Graduate School section. Additional information should be obtained from the Department of Geography.

The course code for this program is GEOG.

Master's Degree

- Geography - Master of Arts (MA) (p. 994)

Doctoral Degree

- Geography - Doctor of Philosophy (PhD) (p. 995)

Certificates

- Development Studies - Graduate Certificate (p. 996)
- Population Studies - Graduate Certificate (p. 996)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abdalati, Waleed (https://experts.colorado.edu/display/fisid_145800)
Professor; PhD, University of Colorado Boulder

Anderson, Suzanne Prestrud (https://experts.colorado.edu/display/fisid_131099)
Professor; PhD, University of California-Berkeley

Balch, Jennifer Kakareka (https://experts.colorado.edu/display/fisid_154464)
Assistant Professor; PhD, Yale University

Barnard, Holly Rene (https://experts.colorado.edu/display/fisid_147417)
Assistant Professor; PhD, Oregon State University

Barry, Roger G.
Professor Emeritus

Blanken, Peter David (https://experts.colorado.edu/display/fisid_114026)
Professor; PhD, Univ of British Columbia (Canada)

Bryan, Joseph Henry (https://experts.colorado.edu/display/fisid_145802)
Associate Professor; PhD, University of California-Berkeley

Buddenfield, Barbara P (https://experts.colorado.edu/display/fisid_107860)
Professor; PhD, University of Washington

Caine, T. Nelson
Professor Emeritus

Erickson, Kenneth A.
Professor Emeritus

Farmer, Carson J.Q. (https://experts.colorado.edu/display/fisid_156292)
Assistant Professor; PhD, National University of Ireland (Ireland)

Fluri, Jennifer L (https://experts.colorado.edu/display/fisid_154033)
Associate Professor; PhD, Pennsylvania State University

Foote, Kenneth E.
Professor Emeritus

Goldman, Mara Jill (https://experts.colorado.edu/display/fisid_143542)
Associate Professor; PhD, University of Wisconsin-Madison

Jan, Najeeb A (https://experts.colorado.edu/display/fisid_143581)
Assistant Professor; PhD, University of Michigan Ann Arbor

Kittel, Timothy (https://experts.colorado.edu/display/fisid_139473)
Lecturer

Leyk, Stefan (https://experts.colorado.edu/display/fisid_145192)
Associate Professor; PhD, Univ of Zurich (Switzerland)

Molotch, Noah Paul (https://experts.colorado.edu/display/fisid_139374)
Associate Professor; PhD, University of Arizona

O'Loughlin, John (https://experts.colorado.edu/display/fisid_101339)
Professor; PhD, Pennsylvania State University

Oakes, Timothy S. (https://experts.colorado.edu/display/fisid_109269)
Professor; PhD, University of Washington

Pitlick, John (https://experts.colorado.edu/display/fisid_105951)
Professor; PhD, Colorado State University

Riosmena, Fernando (https://experts.colorado.edu/display/fisid_144419)
Associate Professor; PhD, University of Pennsylvania

Rogers, Andrei
Professor Emeritus

Serreze, Mark (https://experts.colorado.edu/display/fisid_106334)
Professor; PhD, University of Colorado Boulder

Spielman, Seth Edward (https://experts.colorado.edu/display/fisid_148271)
Associate Professor; PhD, SUNY at Buffalo

Steffen, Konrad
Professor Emeritus

Travis, William R (https://experts.colorado.edu/display/fisid_101777)
Associate Professor; PhD, Clark University

Veblen, Thomas T (https://experts.colorado.edu/display/fisid_105842)
Professor; PhD, University of California-Berkeley

Williams, Mark W (https://experts.colorado.edu/display/fisid_105438)
Professor; PhD, University of California-Santa Barbara

Yeh, Emily Ting (https://experts.colorado.edu/display/fisid_130119)
Professor; PhD, University of California-Berkeley

Courses

GEOG 5003 (4) Elements of Geographic Information Systems

Discusses incorporating GIS methods into graduate thesis or dissertation research. Reviews basic mapping concepts (scale and projections), acquiring different types of spatial data (raster and vector), building an error-free database, making simple queries, overlays, charts, and maps. Intended for students who want to learn GIS but lack background skills in computing or cartography.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite some experience with Mac or Windows.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5023 (4) Introduction to Quantitative Methods in Human Geography

Introduces fundamental statistical and quantitative modeling techniques widely used in geography today. Emphasizes geographic examples and spatial problems, as are statistical routines now available on most computers.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4023

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5043 (4) Cartography 2: Interactive and Multimedia Mapping

An advanced course in interactive, multimedia, animated and Web-based cartography stressing the important role digital cartography plays in cyberspace. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4043

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4093 and GEOL 4093 and GEOL 5093

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5100 (1-4) Special Topics: Geography

Covers various topics outside of the normal curriculum; offered intermittently depending on student demand and availability of faculty. **Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 5103 (4) Geographic Information Systems

Examines construction and use of an information system and its data specifically designed for representing and manipulating geographical data. Emphasizes modern geographical information systems including computer hardware/software with a collection of methods/procedures for recording, transforming, storing/retrieving, analyzing, and mapping geographic data.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4103

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5113 (3) Seminar: Geographic Information Systems

Focuses on the current research topics in geographical information systems and selected areas of application. Includes major journal articles related to each topic. Students complete and present a seminar paper.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 4103 or GEOG 5103 or instructor consent required.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5152 (3) History and Theory of Geography

History of ideas and institutions that have shaped contemporary geographic inquiry. Examines the evolving relations among human geography, physical geography, environment-society relations, and geographic information processing. Designed to situate graduate student research within major subfields and intellectual currents of geography.

Requisites: Restricted to Geography (GEOG) graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5161 (3) Research Design in Geography

The human section reads and discusses contemporary research philosophies and methodologies in human geography. Practices the development of research proposals and presentation of research ideas and results. The physical section reads and discusses contemporary research philosophies and methodologies in physical geography (climatology, geomorphology, biogeography, and soils geography). Practices the development of research proposals and presentation of research ideas.

Requisites: Restricted to Geography (GEOG) graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5203 (4) Geographic Information Science: Modeling Applications

Extends basic GIS concepts and mechanics. Develop GIS models for human and environmental applications. Grid and vector data models, tessellated and hierarchical data structures, terrain representation, interpolation and kriging, spatial regression. Small group projects design, implement and run GIS models.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4203

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 4103 or GEOG 5103 or working knowledge of GIS software or instructor consent required.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5211 (3) Seminar: Physical Climatology

Involves a research seminar concerned with problems of mass and energy exchange in the Earth-atmosphere system. Selects topics from such areas as air quality, bioclimatology, hydrology, climate change, and the climates of urban, agricultural, and natural environments.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5221 (3) Synoptic and Dynamic Climatology

Examines global climates from the standpoint of synoptic and dynamic climatology.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5241 (1-3) Topics in Physical Geography

Presents recent research topics that vary from year to year. Consult the online Schedule Planner for specific topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5251 (4) Fluvial Geomorphology

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4251

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5271 (3) The Arctic Climate System

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4271

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5292 (3) Migration, Immigrant Adaptation, and Development

historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4292 and ECON 4292

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5303 (4) GIS Programming for Spatial Analysis

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data. Covers concepts, principles and techniques of programming and solving spatial problems in physical and human geography.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4303

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5321 (3-4) Snow Hydrology

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4321

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5331 (3-4) Mountain Climatology

Surveys and analyzes climatic characteristics of mountain environments worldwide.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4331

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5371 (3) Forest Geography: Principles and Dynamics

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4371

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5391 (3) Seminar: Biogeography

Considers in detail current research themes in biogeography. Includes intensive reading of current research literature and preparation of research papers. Topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5401 (3) Soils Geography

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4401

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5403 (3) Space Time Analytics

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands on, flipped classroom approach with in-class development of technical skills.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4403

Requisites: Restricted to graduate students only.

GEOG 5463 (3) Earth Analytics Data Science Bootcamp

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4463

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

GEOG 5501 (3) Water Resources and Water Management of Western United States

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4501

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5503 (3) GIS and Geospatial Project Management

Managing a geospatial project encompasses problem design, analysis and team dynamics. The class mixes lectures and class exercises with student-selected projects. Lectures run concurrent with projects, working through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4503

Requisites: Requires prerequisite course of GEOG 5103 (minimum grade C-).

GEOG 5563 (3) Earth Analytics

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4563

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

GEOG 5603 (3) GIS in the Social and Natural Sciences

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4603

GEOG 5622 (3) City Life

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4622

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5632 (3) Development Geography

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4632

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5642 (3) Seminar: Urban Geography

Surveys current research topics in urban geography. Emphasizes definition of possible student thesis topics.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5652 (3) Introduction to Social Theory

Surveys theoretical paradigms in the social sciences. Includes canonical works from the history of the social sciences as well as contemporary theorists. Appropriate for beginning to advanced graduate students doing qualitative research.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5662 (3) Seminar: Topics in Economic Geography

Covers selected topics emphasizing faculty specialties. Topics vary with instructor. Check with department for semester offerings.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5663 (3) Earth Analytics Applications

Develop expertise in finding, organizing, managing and processing large, heterogeneous, spatio-temporal data to address a real-world problem.

Students will work collaboratively on semi-guided science project.

Students gain critical skills required to understand data structures, utilize APIs, extract insight from data and understand how uncertainty propagates. Culminates with a formal presentation of project results.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites GEOG 4463 or GEOG 4563 or GEOG 5463 or GEOG 5563.

Grading Basis: Letter Grade

GEOG 5712 (3) Political Geography

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4712

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5722 (3) Field Methods in Human Geography

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4722

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5732 (3) Population Geography

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4732

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5782 (3) Sustainable Development: Critique

Investigates historical and contemporary theories and critiques of development and their implications for geographic theory and method. Focuses on the role of representation in evaluating case studies and examining the potential for a sustainable development.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5832 (3) Geography of Tibet

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4832

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 5840 (1-3) Graduate Independent Study

Offers independent research for master's students only. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 5852 (3) Health and Medical Geography

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4852

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5930 (3) Advanced Internship

Provides an academically supervised opportunity for graduate-level geography majors to work in public and private organizations on advanced projects related to geographic theory and their career goals. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 5961 (3) Theories of Climate and Climate Variability

Critically reviews current theories of climatic variability based on analysis of the different physical processes affecting climate.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 6180 (1-3) Seminar: Geographic Problems

Applies research methods to selected problems. Topics vary with instructor.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

GEOG 6211 (1-3) Readings in Climatology

Discusses selected topics in current climatological literature. Specific themes vary.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 6402 (3) Seminar: Political Ecology

Critically examines the politics of human-environment relationships across cultures and societies. Focuses on environmental degradation, change and management from the perspectives including political economy, cultural politics, STS and post structural theory.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6443 (2) Remote Sensing Field Methods

Theory and practical field measurements for validation of airborne and spaceborne spectral image acquisition. Emphasizes radiative scattering properties of soil, vegetation, cryosphere and atmosphere. Focuses on characterization and calibration of instrumentation to measure these properties.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6440

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 5093 or GEOL 5093.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 6712 (3) Seminar: Political Geography

Considers in detail history and methodology of the field, including an analysis of selected systematic topics such as frontiers and boundaries, international rivers, conflicting claims to territory, and electoral geography.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6732 (3) Formal Population Geography: Analysis and Forecasting

In-depth introduction to formal demography. In addition to learning the basic demographic tools used nowadays in fertility, marriage, mortality, migration and forecasting/projections, it also looks at some potential links between formal and statistical demographic work that would enable the student to apply some of the methods learnt in an econometric or multivariate setting.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 5023.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6742 (3) Seminar: Cultural Geography

Explores various geographic topics emphasizing the concept of culture. Emergence of several points of view in the development of cultural geography.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6940 (1) Master's Degree Candidate

Instructor consent required.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

GEOG 6950 (1-6) Master's Thesis

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

GEOG 7840 (1-3) Graduate Independent Study

Offers independent research for doctoral students only. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section. Instructor consent required.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Geography - Master of Arts (MA)

The basic purpose of the graduate program in the Department of Geography is to train scholars and professionals to produce and disseminate knowledge and to make outstanding contributions in the public and private sectors.

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read the Master's Degree Requirements (p. 866) section carefully.

Requirements

Prerequisites

For admission without deficiency and to meet the department mandatory requirements for a knowledge of basic geography, all entering graduate students are required to possess the knowledge presented in freshman-level introductory courses in physical and human geography.

Students may acquire this knowledge in any way they choose: by formally taking the introductory courses, by auditing the courses, by reading the textbooks themselves or by other means. This knowledge will enable the student to perform at the level expected in the MA program's required core classes.

In addition to knowledge of basic geography, it is desirable that the student has course work in at least two areas outside geography in cognate fields in the social and natural sciences. Students are encouraged to have some background in college math, statistics and computer skills.

General Requirements

The minimum requirements for an MA in geography may be fulfilled by completing 30 credit hours of graduate work (5000 level or above), including 4 to 6 credit hours of thesis work. Master's students may, with the written approval of their advisor, use a maximum of 6 hours of 3000- or 4000-level course work to reach the required 30 hours.

Required Courses

GEOG 5152	History and Theory of Geography	3
GEOG 5161	Research Design in Geography	3
GEOG 5023	Introduction to Quantitative Methods in Human Geography	4
or GEOG 5722	Field Methods in Human Geography	
GEOG 6950	Master's Thesis	4-6
Electives		

Select at least 14 additional hours of course work at the 5000 level or above to meet the 30-credit minimum.

Total Credit Hours 30

Geography - Doctor of Philosophy (PhD)

The basic purpose of the graduate program in the Department of Geography is to train scholars and professionals to produce and disseminate knowledge and to make outstanding contributions in the public and private sectors.

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read the Doctoral Degree Requirements (p. 867) section carefully.

Requirements

Prerequisites

For admission without deficiency and to meet the department mandatory requirements for a knowledge of basic geography, all entering graduate students are required to possess the knowledge presented in freshman-level introductory courses in physical and human geography.

Students may acquire this knowledge in any way they choose: by formally taking the introductory courses, by auditing the courses, by reading the textbooks themselves or by other means. This knowledge will enable the student to perform at the level expected in the PhD program's required core classes.

In addition to knowledge of basic geography, it is desirable that the student has course work in at least two areas outside geography in cognate fields in the social and natural sciences. Students are encouraged to have some background in college math, statistics and computer skills.

General Requirements

The PhD degree is not conferred merely upon the satisfactory completion of a course of study. The candidate must also demonstrate proficiency in some broad subject of learning, and be able to critically evaluate work in the field, show the ability to work independently in the chosen field and make an original contribution of significance to the advancement of knowledge.

The minimum requirements are 30 credit hours of course work numbered 5000 or above and 30 credit hours of dissertation. Ordinarily the number of course work hours and dissertation hours will be greater than 30 each. At least 20 of these hours must be taken at the University of Colorado; up to 10 credit hours from another institution may be transferred upon approval.

A 3.00 (B) average or higher must be maintained in all course work.

Six semesters of residence are required beyond the bachelor's degree, of which four must be at the University of Colorado; this may include two semesters for the master's degree. With department approval, students with a University of Colorado master's degree in geography may apply all credit hours from 5000-level courses or above (except thesis credits) to the PhD requirements.

Language Requirement

The department's minimum language requirement is a demonstration of proficiency in one foreign language. Ways in which this requirement may be satisfied are determined by the student's Advisory Committee and may include timed translation, publication in the language and/or course work. If more than the minimum proficiency is needed for library and/or field research, the choice and number of languages, as well as the required level of skill and methods of testing these skills, are determined and approved by the student's Advisory Committee. The language requirement must be satisfied before the comprehensive exam is taken.

Preliminary Exam

The Graduate School requires that all students in the doctoral program successfully pass a preliminary exam. In geography, this requirement is met by obtaining a grade of B or better in each of the three required courses:

Required Courses

GEOG 5152	History and Theory of Geography	3
GEOG 5161	Research Design in Geography	3
GEOG 5023	Introduction to Quantitative Methods in Human Geography	4
	or GEOG 5722 Field Methods in Human Geography	

Total Credit Hours 10

Following completion of the preliminary exam requirement, students undertake preparation for comprehensive exams.

Comprehensive Exams

Following successful completion of the preliminary exam, doctoral students must pass a comprehensive exam for advancement to candidacy for the doctoral degree. The comprehensive exam consists of two parts, including an exam on three subfields of geography with written and oral components, and completion of a written dissertation proposal and oral defense. Working together, the student and an Advisory Committee of three to five faculty set the subfield topics. The student creates a reading list for each subfield, and usually spends a semester reading and preparing for the subfields exam. The Advisory Committee sets the subfields exam questions and evaluates the written and oral responses, as well as the proposal defense. Upon successful completion of the comprehensive exam, a student can turn full attention to dissertation research and writing.

Dissertation

In addition to the minimum of 30 hours of course work required for the doctorate, a student must register for a total of at least 30 hours of dissertation credit, with a maximum of 10 hours in any one semester. Not more than 10 of these hours may be obtained before the student has been approved as a candidate for the doctorate (i.e., before the comprehensive exam is passed). Course work and work on the dissertation may proceed concurrently throughout the PhD program, but at no time shall a doctoral student register for more than 15 hours of 5000-level courses and above.

Following successful completion of comprehensives and admission to candidacy, students must register continuously. Students admitted to candidacy for degree will register for and be charged for a minimum of five dissertation hours each semester. Students may also register for classes in addition to the five dissertation hours.

After admission to candidacy, those not making use of campus facilities may register for three dissertation hours (part-time status). Continuous registration during the academic year will be required until completion of the dissertation defense. It is expected that the student and advisor will consult each semester as to the number of hours for which the student will register, consistent with the classifications described above.

Development Studies - Graduate Certificate

The Department of Geography offers a graduate certificate in development studies. Development studies is a well-established, interdisciplinary field of research with institutional centers at a number of major universities and several scholarly journals dedicated to its study. The certificate provides training in development studies to graduate students through a structured yet flexible program built around courses taught by CU faculty in a number of social science departments.

Because development issues such as agrarian change, labor migration, new social movements, industrial growth, urban planning and natural resource use cut across disciplinary divides, the study of development demands interdisciplinary approaches.

For more information, visit the department's Graduate Certificate in Development Studies (http://geography.colorado.edu/grad_program/certificates) webpage.

Requirements

Currently enrolled graduate students at CU and nondegree ACCESS students with bachelor's degrees may pursue the development studies certificate by completing the four required courses with a grade of B or higher.

The certificate requires the completion of 12 credits (four courses), at least two but not more than three of which should be taken in the Department of Geography.

For more information, please contact the certificate director, Jennifer Fluri (Jennifer.Fluri@colorado.edu).

Population Studies - Graduate Certificate

Offered through the Population Program of the Institute of Behavioral Science (IBS), the Graduate Certificate in Population Studies recognizes master's and doctoral degree students for interdisciplinary work in demography. The Population Program, which is international in scope and has an applied and policy-oriented focus, fosters research on population trends and patterns and provides training in population analysis. Students who are earning graduate degrees through the Departments of Economics, Geography or Sociology and are interested in majoring in demography are eligible to petition for admission to the program.

Questions about the certificate program in population studies should be directed to:

Population Program
Institute of Behavioral Science
University of Colorado Boulder
484 UCB
Boulder, CO 80309-0484
303-492-7986

www.colorado.edu/ibs/pop (<http://www.colorado.edu/ibs/pop>)
cupc@colorado.edu

Requirements

The Population Program emphasizes research training through direct faculty/student interaction and involvement in research projects.

Possible courses include:

GEOG 6732	Formal Population Geography: Analysis and Forecasting	3
SOCY 6012	Population Issues, Problems, and Policies	3

Students are granted a certificate on the basis of the three core courses, their independent research and their thesis or dissertation.

For more information please see here (<https://behavioralscience.colorado.edu/unit/population/graduate-certificate-in-demography>).

Geological Sciences

With one of the most successful graduate programs in the nation, the Department of Geological Sciences has enjoyed a reputation of excellence for more than 100 years. Our doctoral program is ranked among the top 10 percent of U.S. geology programs by the National Research Council and is ranked 9th by *U.S. News and World Report*.

Graduate students have an opportunity to work with approximately 30 tenure and tenure-track faculty who support a wide range of interdisciplinary research programs in biochemistry, economic resources, geodynamics, geophysics, glaciology, global climate change, hydrogeology, paleontology and surficial processes.

The graduate degrees offered include Master of Science (MS) and Doctor of Philosophy (PhD).

Students interested in graduate work in the geological sciences should carefully read the detailed information regarding admission, registration and degree requirements on the Geological Sciences (<http://www.cugeology.org>) website.

Course code for this program is GEOL.

Master's Degree

- Geology - Master of Science (MS) (p. 1002)

Doctoral Degrees

- Geology - Doctor of Philosophy (PhD) (p. 1002)
- Geophysics - Doctor of Philosophy (PhD) (p. 1002)

Certificates

- Geophysics - Graduate Certificate (p. 1003)
- Hydrologic Sciences - Graduate Certificate (p. 1004)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lon D (https://experts.colorado.edu/display/fisid_145044)
Senior Instructor

- Anderson, Robert S (https://experts.colorado.edu/display/fisid_130117)
Distinguished Professor; PhD, University of Washington
- Andrews, John T.
Professor Emeritus
- Atkinson, William W. Jr
Professor Emeritus
- Bilham, Roger G.
Professor Emeritus
- Birkeland, Peter W.
Professor Emeritus
- Bradley, William C.
Professor Emeritus
- Budd, David A (https://experts.colorado.edu/display/fisid_101963)
Professor; PhD, University of Texas at Austin
- Chin, Karen (https://experts.colorado.edu/display/fisid_122666)
Associate Professor; PhD, University of California-Santa Barbara
- Eberle, Jaelyn J (https://experts.colorado.edu/display/fisid_126544)
Associate Professor; PhD, University of Wyoming
- Eicher, Don L.
Professor Emeritus
- Farmer, G Lang (https://experts.colorado.edu/display/fisid_100498)
Professor; PhD, University of California-Los Angeles
- Flowers, Rebecca M (https://experts.colorado.edu/display/fisid_144054)
Associate Professor; PhD, Massachusetts Institute of Technology
- Ge, Shemin (https://experts.colorado.edu/display/fisid_101387)
Professor; PhD, Johns Hopkins University
- Goetz, F. H. Alexander
Professor Emeritus
- Hynek, Brian Michael (https://experts.colorado.edu/display/fisid_130622)
Associate Professor; PhD, Washington University
- Jakosky, Bruce M (https://experts.colorado.edu/display/fisid_105845)
Professor; PhD, California Institute of Technology
- Jones, Craig H (https://experts.colorado.edu/display/fisid_105590)
Professor; PhD, Massachusetts Institute of Technology
- Kraus, Mary J (https://experts.colorado.edu/display/fisid_100903)
Professor; PhD, University of Colorado Boulder
- Larson, Edwin E.
Professor Emeritus
- Lester, Alan P. (https://experts.colorado.edu/display/fisid_105385)
Lecturer; PhD, University of Colorado Boulder
- Mahan, Kevin H (https://experts.colorado.edu/display/fisid_143975)
Associate Professor; PhD, University of Massachusetts at Amherst
- Marchitto, Thomas (https://experts.colorado.edu/display/fisid_128241)
Associate Professor; PhD, Massachusetts Institute of Technology
- Miller, Gifford Hubbs (https://experts.colorado.edu/display/fisid_102374)
Professor; PhD, University of Colorado Boulder
- Mojzsis, Stephen J (https://experts.colorado.edu/display/fisid_118484)
Professor; PhD, University of California-San Diego
- Molnar, Peter Hale (https://experts.colorado.edu/display/fisid_114528)
Professor; PhD, Columbia University In the City of New York
- Mueller, Karl Jules (https://experts.colorado.edu/display/fisid_107629)
Professor; PhD, University of Wyoming
- Munoz, James L.
Professor Emeritus
- Robinson, Peter
Professor Emeritus
- Runnells, Don
Professor Emeritus
- Sepulveda Arellano, Julio Cesar (https://experts.colorado.edu/display/fisid_154923)
Assistant Professor; PhD, University of Bremen (Germany)
- Sheehan, Anne (https://experts.colorado.edu/display/fisid_103645)
Professor; PhD, Massachusetts Institute of Technology
- Smyth, Joseph R (https://experts.colorado.edu/display/fisid_101056)
Professor; PhD, University of Chicago
- Snell, Kathryn Elaine (https://experts.colorado.edu/display/fisid_155298)
Assistant Professor; PhD, University of California-Santa Cruz
- Spetzler, Hartmut A. W.
Professor Emeritus
- Stern, Charles R (https://experts.colorado.edu/display/fisid_100941)
Professor; PhD, University of Chicago
- Syvitski, James P (https://experts.colorado.edu/display/fisid_107424)
Professor; PhD, Univ of British Columbia (Canada)
- Templeton, Alexis S (https://experts.colorado.edu/display/fisid_141202)
Associate Professor; PhD, Stanford University
- Tiampo, Kristy F (https://experts.colorado.edu/display/fisid_155908)
Professor; PhD, University of Colorado Boulder
- Tilton, Eric Small (https://experts.colorado.edu/display/fisid_126548)
Professor; PhD, University of California-Santa Cruz
- Tucker, Gregory E (https://experts.colorado.edu/display/fisid_130605)
Professor; PhD, Pennsylvania State University
- Walker, Theodore R.
Professor Emeritus
- Weimer, Paul (https://experts.colorado.edu/display/fisid_104630)
Professor; PhD, University of Texas at Austin
- White, James (https://experts.colorado.edu/display/fisid_102726)
Professor; PhD, Columbia University In the City of New York

Courses

GEOL 5001 (3) Physics and Chemistry of the Solid Earth

Reviews the physical and chemical characteristics of the solid earth, from the core to the crust, and the processes that govern behavior through the earth. Lectures are supplemented with readings from the recent literature. Topics include convection, phase transitions, melt generation, forces of plate tectonics, origin of continents and lithosphere, continental tectonics, and earthquakes.

Requisites: Restricted to graduate students only.

Recommended: Requisite a course in basic chemistry and a course in physics.

Additional Information: Departmental Category: Graduate Course

GEOL 5002 (3) Physics, Chemistry, and Biology of Sedimentary Systems

Reading and discussion of current issues and themes in the stratigraphic sciences, including stratigraphic and facies analysis, spatial heterogeneity and self-organization, numerical modeling; origin, evolution, mass extinctions, and megatrazjectories of life; and paleoceanographic and paleoclimatic signals in sedimentary rocks. Goal is to diversify students' understanding of the role of physics, chemistry, and biology in attacking research problems in sedimentary systems. Department enforced requisite, restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5060 (4) Oceanography

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4060

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5080 (3) Advanced Hydrogeology and Modeling Concepts

Introduces advanced groundwater flow and modeling concepts, equations for steady state and transient flow, saturated and unsaturated flow, finite difference method, application of modeling in geologic processes, radial flow and aquifer parameters, infiltration and groundwater recharge, model calibration, verification and prediction. Department enforced prerequisite: MATH 2300 or Fortran.

Additional Information: Departmental Category: Graduate Course

GEOL 5093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4093 and GEOG 4093 and GEOG 5093

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5110 (3) Geomechanics

Introduces fundamental physical processes important to the transport of heat and mass in the Earth and on Earth's surface. Provides practice with quantitative treatment of geological problems. Solutions for each problem are derived from first principles, including conservation and flux laws. Emphasizes heat conduction and viscous fluid flow. Department enforced prerequisite: restricted to graduate students only and a course in calculus.

Additional Information: Departmental Category: Graduate Course

GEOL 5150 (2) Planetary Field Geology

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4150

Additional Information: Departmental Category: Graduate Course

GEOL 5215 (3) Geochronology and Thermochronology

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4215

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5270 (3) Marine Chemistry and Geochemistry

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical separation in seawater; the marine carbon cycle and its long-term control on atmospheric CO₂; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4270

Recommended: Prerequisites introductory chemistry, introductory geology, introductory oceanography.

Additional Information: Departmental Category: Graduate Course

GEOL 5280 (3) Aqueous and Environmental Geochemistry

Explores the fundamentals of low-temperature geochemistry to investigate element speciation and chemical behavior in waters, soils and sediments. Topics include water-rock interaction and weathering, mineral dissolution and precipitation reactions, aqueous complexation, mineral surface chemistry, kinetics, element cycles, and redox biogeochemistry. Includes exposure to spectroscopic tools, computer simulations and microbial geochemistry. Department enforced prerequisite: GEOL 3320 or 1 year of college chemistry.

Additional Information: Departmental Category: Graduate Course

GEOL 5305 (3) Global Biogeochemical Cycles

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed along with global scale measurements of element fluxes from satellites, aircraft and measurement networks. Department enforced prerequisite: restricted to graduate students only, general chemistry and some organic chemistry.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5840

Additional Information: Departmental Category: Graduate Course

GEOL 5330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4330 and ASTR 4330 and ASTR 5330

Additional Information: Departmental Category: Graduate Course

GEOL 5420 (3) Quaternary Dating Methods

Features in-depth survey of standard and experimental dating methods that provide absolute ages for events of the last two million years of Earth history. Includes theory and application of radiocarbon, uranium series, amino acid, thermo-luminescence, fission track, potassium/argon, hydration, light stable isotopes, and other radioactive techniques.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5430 (3) Paleoceanography and Paleoclimatology

Examines scientific tools, data and theories related to the dramatically varied past climate of Earth. Focus will be on marine records of climate change and ocean circulation, but ice core and continental archives will also be discussed. Covers the Cretaceous Period to the present, with particular emphasis on the past 150,000 years (the last ice age cycle). Department enforced prerequisite: restricted to graduate students only and introductory geology and introductory oceanography or atmospheric science.

Additional Information: Departmental Category: Graduate Course

GEOL 5474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4474 and MUSM 5474

Additional Information: Departmental Category: Graduate Course

GEOL 5550 (3) Petroleum Reservoir Characterization and Modeling

Introduces concepts and methods of petroleum reservoir analysis and 3-D reservoir modeling using subsurface data (cores, well logs, 3-D seismic) and outcrop analogs. Examines petroleum system, petrophysics (lithology, porosity, permeability, capillary pressure, flow units), and sequence-stratigraphic, facies, and structural controls on reservoir properties, heterogeneity and recovery efficiency. Deterministic and stochastic reservoir modeling methods are addressed.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4550

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5670 (3) Isotope Geology

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4670

Additional Information: Departmental Category: Graduate Course

GEOL 5675 (3) Stable Isotopes in Paleoclimate and Paleoecology

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4675

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 5690 (3) Tectonic History of the Western United States

Provides students with the practical tools needed to make tectonic interpretations through study of the geologic history of the western United States and the geodynamic models used in interpreting that history. Paleomagnetism, geobarometry, geothermometry, geodynamic modeling, and elements of structural geology and stratigraphy are topics considered in this class.

Requisites: Requires prerequisite courses of GEOL 3120 and PHYS 1110 (all minimum grade D-).

Additional Information: Departmental Category: Graduate Course

GEOL 5700 (1-4) Geological Topics Seminar

Offers seminar studies in geological subjects of special current interest. Primarily for graduate students, as departmental staff and facilities permit.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5701 (2) Super-Problems in Quaternary Climate

Investigates major problems in the study and understanding of Quaternary climate variation, in seminar format. Each year one major topic will be addressed, such as: the physics and chemistry of the Ice Age ocean circulation; the theory and mechanics of glacial/interglacial atmospheric CO₂ change; the origins of the 20, 40, and 100 kyr orbital (Milankovitch) climate cycles. Department enforced prerequisites: introduction geology and climatology or oceanography and paleoclimatology or paleoceanography.

Additional Information: Departmental Category: Graduate Course

GEOL 5702 (1) Geomorphology Seminar

Explores the dynamics and forms of the earth's surface through critical reading and discussion of both classical and modern literature.

Repeatable: Repeatable for up to 10.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 5703 (1) Seminar in Tectonics

Focuses on a wide variety of topics related to crust, mantle and whole earth tectonics. Published papers from recent peer-reviewed literature are read and discussed. The format and specific topics will vary each semester (e.g., a relatively focused theme or open format) and will in part be determined by the makeup of enrolled students. Department enforced prerequisite: restricted to graduate students only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 5711 (1-3) Igneous and Metamorphic Field Geology

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and GEOL 3020.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5712 (1-3) Structural Field Geology

Methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and GEOL 3020.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5714 (2) Field Geophysics

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic and electrical measurements. Department enforced prerequisite: restricted to graduate students only and GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5715 (1-3) Field Techniques in Surficial Geology and Geohydrology

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring steam flows, interpreting aquifer parameters from geophysical measurements and using field data for water budget analysis. Department prerequisite: GEOL 2001 or GEOL 2700.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5716 (1-3) Environmental Field Geochemistry

Develops basic field skills in the most commonly performed tasks required for the environmental characterization of solid and aqueous wastes. Media of study include soils, stream sediments, surface waters, ground waters and atmospheric particulates. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and CHEM 1011 and CHEM 1031 or CHEM 1113 or CHEM 1133 and GEOL 3320.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5717 (1-3) Field Seminar in Geology and Tectonics

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and at least one of the following: GEOL 3120 or GEOL 3320 or GEOL 3430.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5725 (1-4) Field Based Special Topics in Geoscience

Explores selected geological subjects of special interest in a field setting.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4725

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 5800 (3) Planetary Surfaces and Interiors

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5800

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5810 (3) Planetary Atmospheres

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5810 and ASTR 5810

Additional Information: Departmental Category: Graduate Course

GEOL 5820 (3) Origin and Evolution of Planetary Systems

Considers the origin and evolution of planetary systems, including protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5820 and ATOC 5820

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5830 (3) Topics in Planetary Science

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets. Department enforced prerequisite: restricted to graduate students in the physical sciences.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5830 and ASTR 5830

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 5835 (1) Seminar in Planetary Science

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5835 and ATOC 5835

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5840 (1-3) Independent Study-Quaternary Geology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5841 (1-3) Independent Study-Economic Geology**Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5842 (1-3) Independent Study-Petrology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5843 (1-3) Independent Study-Sedimentology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5844 (1-3) Independent Study-Structure/Tectonics****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5845 (1-3) Independent Study-Geochemistry****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5846 (1-3) Independent Study-Geophysics****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5847 (1-3) Independent Study-Hydrology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 5849 (1-3) Independent Study-Paleontology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Additional Information:** Departmental Category: Graduate Course**GEOL 5851 (1-3) Independent Study-Sediment Petrology****Repeatable:** Repeatable for up to 7.00 total credit hours.**Additional Information:** Departmental Category: Graduate Course**GEOL 5852 (1-3) Independent Study--GIS Applications in Quaternary Geosciences**

Leads students through quantitative spatial analysis of environmental and paleoclimatic problems. Each student will develop a project from start to finish, with emphasis on raster GIS for building large empirical databases that bear on process and variability.

Additional Information: Departmental Category: Graduate Course**GEOL 6050 (3) Space Instrumentation**

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6050 and ASEN 6050**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Graduate Course**GEOL 6060 (4) Petroleum Geology of Turbidite Systems**

Covers the exploration and production aspects of petroleum submarine fans and turbidite systems.

Requisites: Requires prerequisite course of GEOL 6330 (minimum grade B).**Additional Information:** Departmental Category: Graduate Course**GEOL 6310 (3) Sedimentary Petrology**

Covers interpretation of depositional and diagenetic history of sedimentary rocks as determined from thin-section studies. Department enforced requisite, restricted to graduate students only. Department enforced prerequisites: GEOL 3010 and GEOL 3020 and GEOL 3430.

Additional Information: Departmental Category: Graduate Course**GEOL 6330 (4) Applied Sequence Stratigraphy and Basin Analysis**

Develops skills in the stratigraphic interpretation of seismic reflection data, recognition of sequence stratigraphy in well logs and outcrop and their applications to basin analysis in petroleum exploration.

Department enforced prerequisite: restricted to graduate students only and introductory undergraduate physics and sedimentology/stratigraphy.

Additional Information: Departmental Category: Graduate Course**GEOL 6610 (3) Earth and Planetary Physics 1**

Offered alternate years. Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6610 and PHYS 6610**Additional Information:** Departmental Category: Graduate Course**GEOL 6620 (3) Earth and Planetary Physics 2**

Offered alternate years. Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6620 and PHYS 6620**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Graduate Course**GEOL 6630 (3) Earth and Planetary Physics 3**

Offered alternate years. Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6630 and PHYS 6630**Additional Information:** Departmental Category: Graduate Course**GEOL 6650 (1-3) Seminar in Geophysics**

Advanced seminar studies in geophysical subjects for graduate students.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6650 and PHYS 6650**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Additional Information:** Departmental Category: Graduate Course**GEOL 6670 (2) Geophysical Inverse Theory**

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations. Department enforced prerequisites: a course in calculus and a course in computer programming (any language).

Equivalent - Duplicate Degree Credit Not Granted: PHYS 6670**Additional Information:** Departmental Category: Graduate Course**GEOL 6940 (1) Master's Degree Candidate****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Graduate Course

GEOL 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 6960 (3) Plan II Master's Research

Additional Information: Departmental Category: Graduate Course

GEOL 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

Geology - Master of Science (MS)

The department's research areas are categorized into four broad research interest groups:

- economic resources / stratigraphic sciences / paleontology
- geodynamics / geophysics / geochemistry / mineral physics / petrology
- global change / surficial processes / quaternary science
- hydrogeosciences

It is highly recommended that students locate a faculty member whose research interests most closely match their own.

Requirements

Admission & Prerequisites

All students applying for admission must take the Graduate Record Examination. Results of this examination are used both for determining admittance and for initial academic counseling. Each student acquires a primary advisor and an advisory committee that provides guidance throughout the degree program.

Entering students normally have completed at least 24 credit hours of basic courses in geological science and two semesters each of chemistry, physics and calculus. In some cases, exceptional undergraduate preparation in other fields of science, mathematics or engineering may substitute for part of the 24 hours in geological science.

Program Requirements

Candidates for the master's degree in geological sciences must complete at least 30 credit hours of graduate course work either with a thesis (Plan I) or without a thesis (Plan II).

A maximum of 6 credit hours may be completed at the 3000- or 4000-level at the discretion of the associate chair for graduate studies and the principle advisor.

Students interested in graduate work in the geological sciences should carefully read the detailed information regarding admission, registration and degree requirements on the department's Information for Prospective Graduate Students (<http://www.colorado.edu/GeolSci/geologygraduatestudents.htm>) webpage.

Plan I: Thesis Option

Students must complete least 24 credit hours at the 5000-level or above, including a minimum of 4, but no more than 6, master's thesis credit hours.

Plan II: Non-thesis Option

Students must complete least 24 credit hours at the 5000-level or above, including at least 3 credit hours of Plan II Master's Research (GEOL 6960) under the supervision of the advisory committee.

Geology - Doctor of Philosophy (PhD)

The department's research areas are categorized into four broad research interest groups:

- economic resources / stratigraphic sciences / paleontology
- geodynamics / geophysics / geochemistry / mineral physics / petrology
- global change / surficial processes / quaternary science
- hydrogeosciences

It is highly recommended that students locate a faculty member whose research interests most closely match their own.

The Department of Geological Sciences participates in the interdepartmental PhD program in geophysics and hydrologic sciences.

Requirements

Admission & Prerequisites

All students applying for admission must take the Graduate Record Examination. Results of this examination are used both for determining admittance and for initial academic counseling. Each student acquires a primary advisor and an advisory committee that provides guidance throughout the degree program.

Entering students normally have completed at least 24 credit hours of basic courses in geological science and two semesters each of chemistry, physics and calculus. In some cases, exceptional undergraduate preparation in other fields of science, mathematics or engineering may substitute for part of the 24 hours in geological science.

Program Requirements

Candidates for the doctoral degree must complete at least 30 credit hours in course work numbered 5000 or above, of which at least 20 must be taken at CU Boulder. In addition to course work, candidates must take a total of at least 30 credit hours of doctoral dissertation (GEOL 8990), with not more than 10 of these taken in any one semester and not more than 10 dissertation credit hours taken before the semester during which the comprehensive examination is passed.

Students interested in graduate work in the geological sciences should carefully read the detailed information regarding admission, registration and degree requirements on the department's Information for Prospective Graduate Students (<http://www.colorado.edu/GeolSci/geologygraduatestudents.htm>) webpage.

Geophysics - Doctor of Philosophy (PhD)

The interdisciplinary doctoral program in geophysics encourages students with a variety of undergraduate backgrounds to pursue graduate study in the physics of the Earth, with special emphasis on the interior of the planet. Students specialize in one of the subfields of geophysics while gaining a broad, general background in the discipline and in-depth

education in the relevant aspects of the parent fields of geology, physics and engineering.

Students enter the program by applying for admission to one of the following departments:

- aerospace engineering sciences
- astrophysical and planetary sciences
- civil, environmental and architectural engineering
- electrical and computer engineering
- geography
- geological sciences
- mechanical engineering
- physics

Upon satisfactory performance on the doctoral preliminary examination given by the home department, the student may formally apply for admission to the geophysics doctoral program.

The program is administered by the geophysics graduate program committee, which includes representatives from each of the participating departments. The comprehensive examination and the dissertation defense are directed by this committee, with a faculty member of the home department normally chairing these procedures.

For more information, visit the Geophysics Studies Program (<http://www.colorado.edu/geophysics>) website.

Requirements

Candidates for the doctoral degree must complete at least 30 credit hours in course work numbered 5000 or above, of which at least 20 must be taken at CU Boulder.

In addition to course work, candidates must take a total of at least 30 credit hours of doctoral dissertation, with not more than 10 of these taken in any one semester and not more than 10 dissertation credit hours taken before the semester during which the comprehensive examination is passed.

Required Courses and Semester Credit Hours

Required Courses

ASTR/GEOL/ PHYS 6610	Earth and Planetary Physics 1	3
ASTR/GEOL/ PHYS 6620	Earth and Planetary Physics 2	3
ASTR/GEOL/ PHYS 6630	Earth and Planetary Physics 3	3
ASTR 6650	Seminar in Geophysics	1-3
One semester of graduate-level applied mathematics from the following:		3
PHYS/MATH 5030	Intermediate Mathematical Physics 1	
APPM 5350	Methods in Applied Mathematics: Fourier Series and Boundary Value Problems	
ASTR 5540	Mathematical Methods	
MCEN 5020	Methods of Engineering Analysis 1	
GEOL 8990	Doctoral Dissertation	30

Electives

Additional courses compatible with the student's research interests 17-15 to complete the 60-credit minimum.

Total Credit Hours 60

For a list of approved elective courses, visit the Geophysics PhD Program (<http://www.colorado.edu/geophysics/academics.html>) webpage.

Geophysics - Graduate Certificate

The geophysics graduate certificate offers a coherent curriculum in geophysics that can complement and supplement a student's regular degree program and encourages multi-disciplinary education in the area of geophysics. The geophysics certificate program allows students to obtain recognition for their accomplishments in geophysics without having to switch into the geophysics degree program. This program was approved by the CU-Boulder Graduate School in spring 2002.

Admission Requirements

A student wishing to be considered for a Certificate in Geophysics must first be admitted as a graduate student into one of the participating graduate departments (ASEN, APS, CEAE, ECEN, GEOG, GEOL, MCEN, PHYS). Students from outside the participating departments can apply for entry to the geophysics certificate program by submitting a letter addressed to the Geophysics Graduate Program Committee. A student must have a course background that includes mathematics through three semesters of calculus and four undergraduate science or engineering courses.

Requirements for Certificate

Completion with a grade of B or better of a total of three geophysics core courses (at least one from the EPP sequence) and one credit hour for the Seminar in Geophysics.

Completion of degree requirements for graduate degree within the student's home department, with a thesis on a topic that uses geophysics in some way, including the successful defense of this thesis before a committee that includes at least one of the geophysics certificate faculty members.

Curriculum

All students must take at least three geophysics core courses, and the Seminar in Geophysics, listed below. At least one of the three geophysics core courses must be from the earth and planetary physics (EPP) series, and at least one of the remaining core classes taken must be from outside the student's home department. Most geophysics core courses are offered once every two years.

A Certificate in Geophysics will be awarded upon the student's completion of degree requirements in their home department. Upon request from a student, the program director and the student's advisor will determine whether a student has met the requirements for the certificate and will generate a letter to the appropriate department head and dean. The certificate is not intended as a substitute for a degree and will be awarded only upon completion of a graduate degree.

Core Courses

Course List

ASTR/GEOL/ PHYS 6610	Earth and Planetary Physics 1
ASTR/GEOL/ PHYS 6620	Earth and Planetary Physics 2

ASTR/GEOL/ PHYS 6630	Earth and Planetary Physics 3
ASTR/GEOL/ PHYS 6650	Seminar in Geophysics
APPM 7300	Nonlinear Waves and Integrable Equations
ASEN 5050	Space Flight Dynamics
ASEN 5090	Introduction to Global Navigation Satellite Systems
ASEN 5245	Radar and Remote Sensing
ASEN 5307	Engineering Data Analysis Methods
ASEN 5335	Aerospace Environment
ASEN 6090	Advanced Global Navigation Satellite Systems: Software and Applications
ASEN 6519	Special Topics
ASTR 5140/ PHYS 5141	Astrophysical and Space Plasmas
ASTR/PHYS 5150	Introductory Plasma Physics
ASTR 5300	Introduction to Magnetospheres
ASTR 5400	Introduction to Fluid Dynamics
ASTR/GEOL 5800	Planetary Surfaces and Interiors
ASTR/ATOC/ GEOL 5820	Origin and Evolution of Planetary Systems
CVEN 5131	Continuum Mechanics and Elasticity
CVEN 5718	Mechanics and Dynamics of Glaciers
CVEN 5768	Introduction to Rock Mechanics
CVEN 6595	Earthquake Engineering
GEOL 5110	Geomechanics
GEOL 5550	Petroleum Reservoir Characterization and Modeling
GEOL 5690	Tectonic History of the Western United States
GEOL 5714	Field Geophysics
GEOL/PHYS 6670	Geophysical Inverse Theory
MCEN 5023	Solid Mechanics 1

Hydrologic Sciences - Graduate Certificate

The CU Boulder hydrologic sciences graduate program focuses on quantitative studies of water in the environment including its role in geologic and biogeochemical processes, ecosystem functions and global elemental cycling. The program is interdisciplinary and interdepartmental. It is intended for science and engineering graduate students, both currently enrolled and prospective. It allows students to obtain recognition for their accomplishments in hydrologic sciences and demonstrates the quantitative multidisciplinary education desired by many prospective employers.

Students can choose to enroll for a full hydrologic sciences PhD degree or obtain a hydrologic sciences graduate certificate while concurrently obtaining a master's or doctoral degree in an associated academic department. Prerequisites and course requirements are identical for the PhD degree and graduate certificate.

Students are members of the broader CU Boulder geophysical sciences program, which has two specialization options: solid-Earth geophysics and hydrologic sciences. All hydrologic sciences students are admitted through one of the participating departments: civil, environmental and architectural engineering; ecology and evolutionary biology; environmental studies; geography; or geological sciences.

Students may apply for admission either concurrently with their application to one of the participating departments or after admission by a department. The program is designed to encourage students with a variety of undergraduate backgrounds to enter the field. Nevertheless, all students in the program must have a substantial background in math and physics, including fluid dynamics. At the time of acceptance, the student will be informed of any undergraduate deficiencies that they will need to address within the first year in the program.

Most hydrologic sciences students conduct research with participating departments, research institutes and centers (e.g., INSTAAR), or partner government agency labs in the Boulder area (e.g., USGS and NOAA). Primary supervision of the student's research may be provided by any faculty member approved by the department.

Additional information is available on the program's About Us (<http://hydrosciences.colorado.edu/about>) webpage or by contacting:

Graduate Coordinator
Hydrologic Sciences Graduate Program
University of Colorado Boulder
450 UCB
Boulder, CO 80309-0450
hydrgrd@colorado.edu

Completion with a grade of B or better in all Hydrologic Sciences required courses (and any courses taken to remedy deficiencies)

Completion of degree requirements for graduate degree within the student's home department.

Additional requirements for Hydrologic Sciences Graduate Certificate:

Thesis topic includes substantial use of hydrologic science.
Thesis committee includes at least one Hydrologic Sciences faculty member.

Students are referred to the document "Graduate School Checklist for Graduation and Other Helpful Information" and the University Catalog for general information on requirements for their degree. In case of a conflict between those documents and the requirements stated here, the rules of the Graduate School apply.

Germanic and Slavic Languages and Literatures

As a department of foreign languages, literatures and cultural studies, the Department of Germanic and Slavic Languages and Literatures prepares students for life and careers in an increasingly global world. Our programs in German, Russian and Nordic Studies enable students to combine their language training with interdisciplinary study of the regions where their language is spoken. The cultural legacies of the Germanic and Slavic countries continue to shape fields such as literature, art, music, film, philosophy and political science.

Course codes for these programs are GRMN, GSSL and RUSS.

Master's Degrees

- German Studies - Master of Arts (MA) (p. 1007)
- Russian Studies - Master of Arts (MA) (p. 1008)

Doctoral Degree

- German Studies - Doctor of Philosophy (PhD) (p. 1009)

Certificate

- Critical Theory - Graduate Certificate (p. 1011)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Firestone, Robert
Professor Emeritus

Gerwig, Inger-Johanne
Professor Emeritus

Greaney, Patrick F. (https://experts.colorado.edu/display/fisid_122807)
Professor; PhD, Johns Hopkins University

Grove, Vicki Jean (https://experts.colorado.edu/display/fisid_103689)
Senior Instructor; PhD, University of Colorado Boulder

Hintz, Saskia Barbara (https://experts.colorado.edu/display/fisid_144506)
Senior Instructor; PhD, New York University

Hoecker, Arne (https://experts.colorado.edu/display/fisid_152973)
Assistant Professor; PhD, Johns Hopkins University

Jany, Ursula Berit (https://experts.colorado.edu/display/fisid_154411)
Instructor; PhD, Ohio State University

Kostoglodova, Elena Yurievna (https://experts.colorado.edu/display/fisid_100976)
Senior Instructor; MA, University of Colorado Boulder

Lee, C. Nicholas
Professor Emeritus

Leiderman, Mark N (https://experts.colorado.edu/display/fisid_115326)
Professor; Dr habil, Ural State Pedagogical Univ (Russia)

Mikhailova, Tatiana Alekseevna (https://experts.colorado.edu/display/fisid_135187)
Senior Instructor; MA, Ural State Univ (Russia)

Muller-Sievers, Helmut Heinz (https://experts.colorado.edu/display/fisid_147511)
Professor; PhD, Stanford University

Osterman, Laura Olson (https://experts.colorado.edu/display/fisid_109800)
Associate Professor; PhD, Yale University

Plank, D. L.
Professor Emeritus

Romanov, Artemi (https://experts.colorado.edu/display/fisid_100659)
Professor; MA, SUNY at Binghamton

Salys, Rimgaila
Professor Emeritus

Sampson, Earl D.
Professor Emeritus

Schindler, Patricia A.
Professor Emeritus

Schmiesing, Ann C (https://experts.colorado.edu/display/fisid_106248)
Professor; PhD, University of Cambridge (England)

Senderovich, Aleksandr M (https://experts.colorado.edu/display/fisid_152981)
Assistant Professor; PhD, Harvard University

Stimilli, Davide (https://experts.colorado.edu/display/fisid_134650)
Associate Professor; PhD, Yale University

Stone, Lauren Shizuko (https://experts.colorado.edu/display/fisid_154888)
Assistant Professor; PhD, New York University

Weber, Beverly Marie (https://experts.colorado.edu/display/fisid_144523)
Associate Professor; PhD, University of Massachusetts at Amherst

Courses

GSL 5900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Germanic and Slavic Courses

RUSS 5010 (4) Advanced Russian Seminar

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4010

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian

RUSS 5020 (4) Advanced Russian Seminar 2

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4020

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian

RUSS 5050 (3) Professional Russian

Introduces graduate and advanced undergraduate students to various stylistic registers of Russian (business, politics, the Internet, TV, etc.). Develops new vocabulary and idiomatics, with a special focus on fluency of speech and written communication skills. Along with language training, the course offers an immersion into the world of contemporary Russian media, politics and culture.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4050

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 5110 (3) Slavic Culture and Society

Examines important ideologies and myths in Slavic societies, with emphasis on contemporary movements and their reinterpretation of history. Acquaints students with major tools for study of cultures of Eastern Europe and the post-Soviet states: research methods, bibliography, transliteration, critical thinking and writing skills. Required for Russian MA.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5120 (3) Russia after Communism: Post-Soviet Politics and Culture

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4120

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5210 (3) Topics in Russian Culture

Selected topics in Russian literature, film, art and music. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4210

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5230 (3) Russian Cultural Idioms

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Formerly GSLL 5230.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4230

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian

RUSS 5352 (3) Russian Novel: Theory and Practice

Examines the Russian novel and its evolution as well as Western and Russian theories of the novel as they engage and reflect upon the claims of modernity. Taught in English. Formerly GSLL 5352.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5401 (3) The Russian Jewish Experience

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4401 and JWST 4401

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5431 (3) Dostoevsky

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English. Formerly GSLL 5431.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4431

RUSS 5441 (3) Tolstoy

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English. Formerly GSLL 5441.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4441

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5451 (3) Chekhov

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English. Formerly GSLL 5451.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4451

RUSS 5471 (3) Women in 20th-21st Century Russian Culture

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English. Formerly GSLL 5471.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4471 and WGST 4471

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English. Formerly GSLL 5481.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4481 and IAFS 3621

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5830 (3) Topics in Literature and History

Taught in English. Formerly GSLL 5830.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5841 (3) History of Modern Russian Drama

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English. Formerly GSLL 5841.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4841

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5851 (3) Critical Thinking: Russian Film and Society

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English. Formerly GSLL 5851.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4851

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5861 (3) Absurd and Supernatural in Russian Literature

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharmis, Bulgakov, Siniavskii, Petrushevskaiia and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English. Formerly GSLL 5861.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4861

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5900 (1-6) Independent Study

See department for registration information. Department enforced requisite: graduate standing or instructor consent.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Russian

RUSS 6940 (1-3) Master's Degree Candidate

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Russian

RUSS 6950 (1-6) Master's Thesis in Russian

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Russian

German Studies - Master of Arts (MA)

Students wishing to pursue the interdisciplinary master's in German should read the Master's Degree Requirements (p. 866) section of this catalog carefully.

Concurrent Degree Program BA/MA in German Studies

The concurrent BA/MA degree in German Studies recognizes the need for master's-level training upon entering the job market in a variety of sectors that call for highly advanced proficiency in the German language, knowledge of German-speaking central Europe and its cultures, and the skills afforded to BA and MA graduates in the humanities (research, analysis, interpretation, translation, communication).

The degree gives highly motivated BA students the opportunity to earn an MA degree using an accelerated undergraduate program in combination with a fifth year of study. Applications can be obtained in the Germanic and Slavic office (McKenna 129). It is recommended that applications be turned in by the spring semester of the sophomore year.

Students must have an overall 3.25 GPA to apply to the program, and should have completed most of their MAPS/core requirements by the end of their sophomore year. No GRE is required.

For more information, visit the Concurrent BA/MA Degree in German Studies (<http://www.colorado.edu/gsl/german/undergraduate/concurrent-bama-degree-german-studies>) webpage. (<http://www.colorado.edu/gsl/german/undergraduate/concurrent-bama-degree-german-studies>)

Dual Degree Program MBA/MA in German Studies

To support the university's mission of advancing knowledge across disciplines, the Leeds School of Business and the Department of Germanic and Slavic Languages and Literatures offer a dual degree, Master of Business Administration and Master of Arts in German Studies. In most cases, students should be able to complete the dual degree in three years with a total of 70 credit hours.

Prospective students must apply to and meet the application and admission requirements for each program separately. See the Department of Germanic and Slavic Languages and Literatures (<http://www.colorado.edu/gsl/german/graduate>) website to apply to the German Studies MA program, and the Leeds School of Business (<http://www.colorado.edu/business/mba>) website to apply to the MBA program.

Requirements Program Requirements

Students applying to the MA degree are expected to have a BA or equivalent in German or BA-level proficiency in German with a BA in a related field, and should have a general knowledge of the German-speaking countries' literature, history and culture.

The master's degree requires either 24 credit hours of approved course work and a master's thesis (6 credit hours) or 30 credit hours of course work without thesis, and reading knowledge of one modern foreign language in addition to German and English.

All German MA students must take Theory and Practice of German Studies (GRMN 5010). All German teaching assistants must also take Applied Linguistics and Foreign Language Teaching Methodology (GRMN 5020). For specific requirements, visit the department's German MA (<http://www.colorado.edu/gsl/german/graduate/ma>) webpage.

Degree Plans

Plan I: Thesis Option (Standard Option)

The thesis option requires 30 credit hours, including 24 hours of course work and 6 thesis hours. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the associate chair of graduate studies. A maximum of 6 hours of independent study course work may be taken with the approval of the associate chair of graduate studies.

Plan II: Non-Thesis Option

The non-thesis option requires 30 credit hours of course work. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the associate chair of graduate studies. A maximum of 6 hours of independent study course work may be taken with the approval of the associate chair of graduate studies.

Language Requirement

Students must have reading knowledge of a second foreign language in order to receive their MA in German. This requirement may be fulfilled by two college-level semesters of a foreign language, an approved study abroad program or a course in reading knowledge of a foreign language. Students should consult with the associate chair of graduate studies at the beginning of their first semester to discuss procedures. The department recommends that this requirement be fulfilled in the first year of study.

Russian Studies - Master of Arts (MA)

The department offers an interdisciplinary professional MA in Russian studies focusing on Russian language proficiency, Russian culture and interrelations between Russian history, politics and culture in the 19th through the 21st centuries. The faculty's interdisciplinary strengths include literature, cinema, folklore, literary/cultural theory, cultural studies, gender studies, sociolinguistics, pedagogy, Jewish Studies, minority studies and nationalism.

The faculty works closely with students to design their own course of study. Some Russian MA students receive a teaching assistantship and tuition waiver.

For contact information and more general information on the MA in Russian studies, visit the Russian Program (<http://www.colorado.edu/gsl/russian-program>) website or email gsl@colorado.edu.

Concurrent Degree Program BA/MA in Russian Studies

Highly motivated undergraduates majoring in Russian studies at CU Boulder have the opportunity to enter a BA/MA program, thereby earning both the BA and the MA in five years. The concurrent degree program offers a unique academic credential designed to produce skilled graduates for a variety of occupations.

In most cases, students must make written application no later than April 1 of the sophomore year. A minimum GPA of 3.00 for all Russian

studies courses is required, as well as two letters of recommendation indicating strong potential for advanced, intensive work in Russian. BA/MA students are expected to take graduate courses in the fourth and fifth years only. Students should have completed most of their MAPS/core requirements by the end of the sophomore year. Only CU Boulder students may apply.

For more information, see the Concurrent BA/MA Degree in Russian Studies (<http://www.colorado.edu/gsl/russian/undergraduate/concurrent-bama-degree-russian-studies>) webpage.

Requirements

Course Requirements

Russian MA students may take up to 12 credit hours in an outside area. CU graduate students frequently choose business, political science, geography, education, history, linguistics, film studies, Jewish studies, religious studies, fine arts, and theater and dance, but students may pursue other options. All outside area courses must be approved by the associate chair of graduate studies.

Upon approval of the Associate Chair of Graduate Studies, students may take up to six credit hours of 3000- or 4000-level courses toward their MA degree.

Students interested in independent study should obtain an informational sheet and an Independent Study Contract from the department. Once the contract is approved by the chair, a staff member will enroll the student in the course. MA students may not take more than a total of 6 hours of independent study.

Transfer credit from accredited institutions is accepted by CU Boulder only after approval by the associate chair of graduate studies and the Graduate School. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. MA students are allowed a maximum of 9 hours of transfer credit.

Degree Plans

Plan I: Thesis Option

Students must complete at least 31 credit hours, including 27 hours of course work and 4 thesis hours. Students must submit a thesis and pass a one-hour oral defense.

Required Courses

RUSS 5010	Advanced Russian Seminar ¹	4
RUSS 5020	Advanced Russian Seminar 2 ¹	4
RUSS 5110	Slavic Culture and Society	3
RUSS 5120	Russia after Communism: Post-Soviet Politics and Culture	3
RUSS 6950	Master's Thesis in Russian	4

Electives

Complete additional courses to fulfill the 31-credit minimum. Options include:

RUSS 5050	Professional Russian ²	
RUSS 5230	Russian Cultural Idioms ²	
RUSS 5352	Russian Novel: Theory and Practice	
RUSS 5401	The Russian Jewish Experience	
RUSS 5431	Dostoevsky	
RUSS 5441	Tolstoy	

RUSS 5451	Chekhov	
RUSS 5471	Women in 20th-21st Century Russian Culture	
RUSS 5481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 5830	Topics in Literature and History	
RUSS 5841	History of Modern Russian Drama	
RUSS 5851	Critical Thinking: Russian Film and Society	
RUSS 5861	Absurd and Supernatural in Russian Literature	
RUSS 5900	Independent Study	
Total Credit Hours		31

¹ Native speakers are exempt from RUSS 5010 and RUSS 5020, and should contact the associate chair of graduate studies for alternate course work.

² These courses are strongly recommended. All students must pass the Russian language proficiency exam, consisting of written and oral components, during their final semester.

Plan II: Non-Thesis Option

Students must complete at least 30 credit hours of course work, then pass a written MA final exam and a one-hour oral defense.

Required Courses

RUSS 5010	Advanced Russian Seminar ¹	4
RUSS 5020	Advanced Russian Seminar 2 ¹	4
RUSS 5110	Slavic Culture and Society	3
RUSS 5120	Russia after Communism: Post-Soviet Politics and Culture	3

Electives

Complete additional courses to fulfill the 30-credit minimum. Options 16 include:

RUSS 5050	Professional Russian ²	
RUSS 5230	Russian Cultural Idioms ²	
RUSS 5352	Russian Novel: Theory and Practice	
RUSS 5401	The Russian Jewish Experience	
RUSS 5431	Dostoevsky	
RUSS 5441	Tolstoy	
RUSS 5451	Chekhov	
RUSS 5471	Women in 20th-21st Century Russian Culture	
RUSS 5481	Rogues to Revolutionaries: Russian Rebels, Past and Present	
RUSS 5830	Topics in Literature and History	
RUSS 5841	History of Modern Russian Drama	
RUSS 5851	Critical Thinking: Russian Film and Society	
RUSS 5861	Absurd and Supernatural in Russian Literature	
RUSS 5900	Independent Study	
Total Credit Hours		30

¹ Native speakers are exempt from RUSS 5010 and RUSS 5020, and should contact the associate chair of graduate studies for alternate course work.

² These courses are strongly recommended. All students must pass the Russian language proficiency exam, consisting of written and oral components, during their final semester.

German Studies - Doctor of Philosophy (PhD)

The interdisciplinary PhD in German studies is designed so that students can complete their course work and their dissertation in four years. The program welcomes applicants who wish to pursue careers in government, business and the nonprofit sector, in addition to applicants interested in an academic career.

In Germany, Austria, Switzerland and many other European countries, it is a strongly held conviction that a doctorate demonstrates to potential employers intellectual independence, superior research and writing skills, the perseverance and ingenuity to complete an original piece of scholarship and deep familiarity with a different culture. These qualities are equally valuable in the 21st-century American economy, and indeed in the global marketplace.

The German Studies PhD program provides intensive and personalized mentoring, directed reading advice and clinics devoted to dissertation and conference-paper writing, digital and archival research, oral presentation and interview preparation. Our PhD strongly emphasizes interdisciplinary work within a secondary concentration area of the student's choice, and includes one year spent abroad at CU Boulder's partner universities of Göttingen and Regensburg or at other leading institutions in the German-speaking world. A wide range of graduate-level course offerings is designed to ensure content coverage and to move research projects into publishable scholarship. The expanded graduate faculty includes scholars in disciplines such as political science, comparative literature, Jewish studies, business and library science.

For more information, contact the department at gsl@colorado.edu or visit the German Program (<http://www.colorado.edu/gsl/german-program>) webpage.

Requirements

Academic Preparation

If a student has gaps in their academic preparation, the department may require them to take additional courses.

Course Requirements

The PhD program requires 30 hours of course work at the 5000-level or above. Students who have completed an MA degree may be able to apply up to 21 hours toward this requirement.

In addition to course work, students must take a total of at least 30 credit hours of doctoral dissertation, with not more than 10 of these taken in any one semester and not more than 10 dissertation credit hours taken before the semester during which the comprehensive examination is passed. Students must be enrolled in a minimum of 5 dissertation hours during the semester in which they defend their dissertation (including summer session, if the defense is held over the summer).

Transfer credit from accredited institutions may be accepted by CU Boulder after approval by the graduate associate chair. PhD students are allowed a maximum of 21 hours of transfer credit. Thesis hours may not be transferred. All courses accepted for transfer credit must be graduate-level courses and must have a grade of B or above. Course work completed more than five years prior to acceptance to the PhD program will be evaluated by the department with regard to current relevance and applicability to the degree requirements. Credit may not be transferred

until the student has completed at least six credits of CU graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA. Thesis hours do not count toward the required 30 hours and cannot be used as transfer credit.

Required Courses and Semester Credit Hours

Required Courses

GRMN 5010	Theory and Practice of German Studies	3
GRMN 5020	Applied Linguistics and Foreign Language Teaching Methodology	3
GRMN 7010	Writing Colloquium	1-3

Electives

At least one course with a focus on pre-20th-century content:		3
GRMN 5210	Seminar: The Age of Enlightenment	
GRMN 5220	Seminar: Topics in the Age of Goethe	
GRMN 5310	Seminar: Topics in the 19th Century	
At least 6 credit hours in an interdisciplinary area of concentration. ¹		6
Additional courses to meet 30-credit minimum.		14-12
Total Credit Hours		30

¹ Students design this concentration in close consultation with their faculty mentor and comprehensive examination and dissertation advisor, and with the approval of the graduate associate chair. Examples of interdisciplinary concentrations include (but are not limited to): critical thought, political science, philosophy, history, comparative literature, gender studies, film studies, Russian studies, Jewish studies, women's studies, geography, environmental studies, economics and international affairs.

Language Requirement

In addition to demonstrating a high level of proficiency in German, you must demonstrate moderate proficiency in an additional foreign language. You can do this by fulfilling one of the following requirements either before or after enrolling at CU Boulder:

- completing a fourth-semester (second-semester sophomore) college language course with a grade of "pass,"
- completing a proficiency exam administered at CU, or
- presenting other evidence of moderate proficiency to the graduate associate chair.

Students should consult with the graduate associate chair at the beginning of their first semester to discuss procedures. This requirement must be fulfilled before or during the semester in which the student advances to candidacy.

Comprehensive PhD Examination

The comprehensive exam tests a student's knowledge in areas of specialization appropriate for their anticipated dissertation topic. The exam takes place in the second or third year, depending on whether the student entered the program with a BA or MA and, if the latter, how many course work credits were applied from the MA. Students take the exam in the spring semester. The exam is based on a reading list the student assembles in close consultation with the members of their committee. It consists of a take-home written exam followed by a two-hour-long oral examination that concentrates on the written exam, but may also address texts and topics on the reading list that are not covered in the written exam. The composition of the comprehensive exam committee follows

the guidelines of the prospectus & dissertation committee composition below.

For more information, visit the department's Comprehensive Examination, Prospectus & Dissertation (<http://www.colorado.edu/gsl/ comprehensive-examination-and-dissertation>) webpage.

Prospectus & Dissertation Committee

After successful completion of the comprehensive examinations, the student forms a dissertation committee and prepares a dissertation prospectus, to be followed by its defense a week later. The dissertation committee should be finalized and a dissertation prospectus submitted no later than the end of the fifth week of the semester following the successful completion of the comprehensive examination.

For more information, visit the department's Comprehensive Examination, Prospectus & Dissertation (<http://www.colorado.edu/gsl/ comprehensive-examination-and-dissertation>) webpage.

Dissertation

The student formally begins to write their dissertation after successfully completing the comprehensive exam and defending the dissertation prospectus. The student should work closely with their dissertation advisor and committee members while writing the dissertation. In particular, students are advised to submit draft copies of each chapter to all members of their committee. Any subsequent changes to the student's "timeline for completion" need to be circulated to the committee for approval. A final draft must be submitted to the committee members at least three weeks before the defense.

Students are required to register continuously for a minimum of five dissertation hours in the fall and spring semesters of each year, beginning with the semester following the passing of the comprehensive exam and extending through the semester in which the student successfully defends their dissertation.

A student who fails to register continuously for dissertation credit hours after passing the comprehensive exam must retake and pass the exam, and validate any course work more than five years old, to regain status as a student in good standing with the graduate school.

For more information, visit the department's Comprehensive Examination, Prospectus & Dissertation (<http://www.colorado.edu/gsl/ comprehensive-examination-and-dissertation>) webpage.

Recommended Course Work

Internships

Students are strongly encouraged to complete at least one internship during their doctoral studies. Three hours of internship credit can count toward the 30 required hours of course work for the PhD. GSLL graduate students have completed internships with businesses, nonprofit agencies and schools, and at locations including Colorado, Germany and Washington, DC. Internship offerings vary by semester. To enroll in a graduate internship, see the associate chair for graduate studies.

Graduate Exchange Opportunities

Students are recommended to spend one academic year abroad during their doctoral studies, on either a CU graduate exchange or an exchange funded by an agency such as the German Academic Exchange Service (DAAD) or the Fulbright Commission. For more information concerning DAAD, Fulbright and other grants, see the department's Scholarships & Awards (<http://www.colorado.edu/gsl/scholarships-awards>) webpage.

In partnership with CU's Office of International Education, GSLL offers funded graduate exchanges at the University of Göttingen and the University of Regensburg. These exchanges offer matriculation at the host institution for one academic year (10 months), plus a monthly stipend for living expenses. One position is offered per year at each institution. To qualify for an exchange, the student must demonstrate fluency in German and evidence of superior academic work.

Students interested in either program should notify the graduate associate chair by Feb. 1 for study abroad the following academic year and formally apply by Feb. 15.

Graduate Certificate Programs

Students are also encouraged to consider completing a graduate certificate program at CU. GSLL offers a critical theory graduate certificate (p. 1011). Other graduate certificates include the women and gender studies graduate certificate (p. 1119) and the comparative ethnic studies graduate certificate (p. 983).

Critical Theory - Graduate Certificate

This certificate offers students a background in philosophical foundations of critical theory. Drawing on disciplines such as philosophy, psychoanalysis, Marxism, literary criticism and sociology, critical theory develops analytical tools for describing and evaluating modern society and cultural production.

Students who are currently enrolled in a graduate disciplinary degree or a professional degree program are encouraged to apply for the Graduate Certificate in Critical Theory early in their graduate career.

For more information, visit the Department of Germanic & Slavic Languages & Literatures (<http://www.colorado.edu/gssl>) website.

Requirements

A total of twelve credit hours are required for completion of the certificate.

Six credit hours of required course work, composed of these two core graduate courses:

GRMN 5030	Foundations of Critical Theory
GRMN 5051	Critical Theory of the Frankfurt School

This sequence of courses is designed to provide the intellectual history and philosophical foundations for contemporary research directions in critical theory. Neither of these courses may be taken as an independent study.

Two additional elective courses in theory. Some of the elective courses recognized by the program include:

ANTH 5785	Advanced Seminar in Cultural Anthropology	3
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	3
ANTH 7620	Seminar: Ethnography and Cultural Theory	3
ARTF 5004	Topics in Film Theory	3
ARTF 5604	Colloquium in Film Aesthetics	3
ARTH 6929	Seminar: Theories of Art History	3
COMM 6010	Communication Research and Theory	3
COMM 6320	Rhetorical Theory	3
COMM 6360	Social and Cultural Theory	3
ENGL 5019	Survey of Contemporary Literary and Cultural Theory	3
ENGL 7489	Advanced Special Topics	3

GEOG 5100	Special Topics: Geography	1-4
GEOG 5632	Development Geography	3
GEOG 6742	Seminar: Cultural Geography	3
HIST 6414	Readings in European Intellectual History	3
HIST 6546	Readings in Cultural History and Theory	3
HIST 7326	Seminar: U.S. Intellectual History	3
MDST 6071	Critical Theories of Media and Culture	3
LING 6320	Linguistic Anthropology	3
LING 7320	Narrative and Identity	3
LING 7350	Language and Gender in Cultural Perspective	3
LING 7360	Language and Sexuality	3
LING 7420	Syntactic Theory	3
MDST 6071	Critical Theories of Media and Culture	3
PHIL 5110	Contemporary Moral Theory	3
PHIL 5200	Contemporary Political Philosophy	3
PHIL 5300	Philosophy of Mind	3
PHIL 5490	Philosophy of Language	3
PSCI 7004	Seminar: Political Theory	3
SOCY 5201	Graduate Seminar in Sociological Theory	3
SOCY 7036	Feminist Theory	3
SPAN 5130	Seminar: Critical Approaches to Hispanic Literature	1-3
WGST 6090	Feminist Theories	3

If you would like to substitute any other course for the electives, please contact the Director of the program. Except for under extraordinary circumstances, independent study courses will not count for the graduate certificate.

Note: Students must obtain a grade of B or above in each course taken toward the certificate.

History

At CU Boulder, history graduate students are trained in the central principles and research methods that characterize the discipline of history through class instruction and professional development seminars. They also gain a thorough grounding in their particular geographical area of study as well as an ability to situate that area of study in a larger global context.

All history graduate students focus their studies in two equally weighted fields:

- a regional/national field (i.e., American/U.S. history, European history or Asian history)
- a global/thematic field, for which students are required to take a variety of courses that examine global and transnational history through specific thematic lenses

For the purposes of the comprehensive examination (portfolio), students are expected to work with their faculty advisors to craft subfields of emphasis within both the regional/national and global/thematic fields.

For more information, visit the department's Graduate Students (<http://www.colorado.edu/history/graduate-students>) webpage.

Course code for this program is HIST.

Master's Degree

- History - Master of Arts (MA) (p. 1020)

Doctoral Degree

- History - Doctor of Philosophy (PhD) (p. 1020)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Fred W (https://experts.colorado.edu/display/fisid_104273)
Professor; PhD, Harvard University

Anderson, Virginia D (https://experts.colorado.edu/display/fisid_100365)
Professor; PhD, Harvard University

Andrews, Thomas G (https://experts.colorado.edu/display/fisid_149881)
Professor; PhD, University of Wisconsin-Madison

Babicz, Martin Charles (https://experts.colorado.edu/display/fisid_147676)
Instructor

Bruce, Scott (https://experts.colorado.edu/display/fisid_122945)
Professor; PhD, Princeton University

Byerly, Carol R (https://experts.colorado.edu/display/fisid_109670)
Lecturer

Carlos, Ann M (https://experts.colorado.edu/display/fisid_105534)
Professor; PhD, Univ of Western Ontario (Canada)

Catlos, Brian Aivars (https://experts.colorado.edu/display/fisid_147829)
Professor; PhD, Univ of Toronto (Canada)

Chambers, Lee Virginia (https://experts.colorado.edu/display/fisid_106130)
Associate Professor; PhD, University of Michigan Ann Arbor

Chester, Lucy P (https://experts.colorado.edu/display/fisid_126541)
Associate Professor; PhD, Yale University

Christensen, Carl C.
Professor Emeritus

Ciarlo, David Michael (https://experts.colorado.edu/display/fisid_149618)
Associate Professor; PhD, University of Wisconsin-Madison

Dauverd, Celine (https://experts.colorado.edu/display/fisid_145804)
Associate Professor; PhD, University of California-Los Angeles

Dike, Steven (https://experts.colorado.edu/display/fisid_149880)
Instructor; MA, University of Virginia Central office

Engel, Barbara A.
Professor Emeritus

Fenn, Elizabeth Anne (https://experts.colorado.edu/display/fisid_149896)
Professor; PhD, Yale University

Ferry, Robert J (https://experts.colorado.edu/display/fisid_104214)
Associate Professor; PhD, University of Minnesota Twin Cities

Gautam, Sanjay Kumar (https://experts.colorado.edu/display/fisid_140614)
Associate Professor; PhD, University of Chicago

Gerber, Matthew Dean (https://experts.colorado.edu/display/fisid_129799)
Associate Professor; PhD, University of California-Berkeley

Gonzalez, Fredy (https://experts.colorado.edu/display/fisid_152971)
Assistant Professor; PhD, Yale University

Gross, David L (https://experts.colorado.edu/display/fisid_103329)
Professor; PhD, University of Wisconsin-Madison

Gutmann, Myron (https://experts.colorado.edu/display/fisid_154905)
Professor; PhD, Princeton University

Halperin, Liora R (https://experts.colorado.edu/display/fisid_152972)
Assistant Professor; PhD, University of California-Los Angeles

Hammer, Paul E. J. (https://experts.colorado.edu/display/fisid_146581)
Professor; PhD, University of Cambridge (England)

Hanna, Martha (https://experts.colorado.edu/display/fisid_104557)
Professor; PhD, Georgetown University

Hill, Boyd H. Jr
Professor Emeritus

Hohlfelder, Robert
Professor Emeritus

Hulden, Vilja Paivikki (https://experts.colorado.edu/display/fisid_154910)
Instructor

Hunt, Peter (https://experts.colorado.edu/display/fisid_115394)
Professor; PhD, Stanford University

Jankowski, James P.
Professor Emeritus

Kent, Susan K (https://experts.colorado.edu/display/fisid_100080)
Professor; PhD, Brandeis University

Kim, Kwangmin (https://experts.colorado.edu/display/fisid_147160)
Assistant Professor; PhD, University of California-Berkeley

Kingsberg, Miriam L. (https://experts.colorado.edu/display/fisid_147112)
Associate Professor; PhD, University of California-Berkeley

Lebra, Joyce Chapman
Professor Emeritus

Lester, Anne E (https://experts.colorado.edu/display/fisid_139524)
Associate Professor; PhD, Princeton University

Lim, Sungyun A. (https://experts.colorado.edu/display/fisid_148726)
Assistant Professor; PhD, University of California-Berkeley

Limerick, Patricia N (https://experts.colorado.edu/display/fisid_105459)
Professor; PhD, Yale University

Maeda, Daryl Joji (https://experts.colorado.edu/display/fisid_141460)
Associate Professor; PhD, University of Michigan Ann Arbor

Main, Gloria L.
Professor Emeritus

Mann, Ralph
Professor Emeritus

McGranahan, Carole Ann (https://experts.colorado.edu/display/fisid_122673)
Associate Professor; PhD, University of Michigan Ann Arbor

McIntosh, Marjorie K.
Professor Emeritus

Medak-Saltzman, Danika Fawn (https://experts.colorado.edu/display/fisid_145844)
Assistant Professor; PhD, University of California-Berkeley

Mukherjee, Mithi (https://experts.colorado.edu/display/fisid_123112)
Associate Professor; PhD, University of Chicago

Osborne, Myles Gregory (https://experts.colorado.edu/display/fisid_145809)
Associate Professor; PhD, Harvard University

Paradis, David (https://experts.colorado.edu/display/fisid_126959)
Instructor; PhD, Emory University

Perez, Emma Marie (https://experts.colorado.edu/display/fisid_130962)
Professor; PhD, University of California-Los Angeles

Phillips, George H.
Professor Emeritus

Pittenger, Mark A (https://experts.colorado.edu/display/fisid_102007)
Professor; PhD, University of Michigan Ann Arbor

Ruestow, Edward G.
Professor Emeritus

Scamehorn, Howard Lee
Professor Emeritus

Schulzinger, Robert D.
Professor Emeritus

Shneer, David (https://experts.colorado.edu/display/fisid_146105)
Professor; PhD, University of California-Berkeley

Sohi, Seema (https://experts.colorado.edu/display/fisid_144616)
Associate Professor; PhD, University of Washington

Spires, David N.
Professor Emeritus

Sutter, Paul Shriver (https://experts.colorado.edu/display/fisid_147513)
Professor; PhD, University of Kansas

Wei, William (https://experts.colorado.edu/display/fisid_100864)
Professor; PhD, University of Michigan Ann Arbor

Weston, Timothy B (https://experts.colorado.edu/display/fisid_107605)
Associate Professor; PhD, University of California-Berkeley

Willis, John Matthew (https://experts.colorado.edu/display/fisid_140095)
Associate Professor; PhD, New York University

Yonemoto, Marcia A (https://experts.colorado.edu/display/fisid_107199)
Associate Professor; PhD, University of California-Berkeley

Young, Phoebe S. K. (https://experts.colorado.edu/display/fisid_147429)
Associate Professor; PhD, University of California-San Diego

Zeiler, Thomas W (https://experts.colorado.edu/display/fisid_101692)
Professor; PhD, University of Massachusetts at Amherst

Courses

HIST 5000 (3) Historical Methods: Introduction to the Professional Study of History

Introduces purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 5012 (3) Graduate Colloquium in European History

Acquaints students with key works in the literature of European history, and addresses matters of method and interpretation. Department enforced requisite: admission to the graduate program in history.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5013 (3) Law and Society in Premodern England to 1688

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4013

Requisites: Restricted to graduate students only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5048 (3) Latin American Revolutions

Examines the origins, development and continuing influence of 20th century Latin American revolutionary movements, with a focus on placing these struggles in comparative historical context. Explores various approaches to revolution and the general role of left political formations in Latin America. Specific focus can vary by semester with examples drawn from various Latin American countries, including Mexico, Guatemala, Cuba, Chile and Nicaragua.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4048

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5053 (3) Britain and the Empire, 1688-1964

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4053

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4061 and CLAS 4061 and CLAS 5061

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 5106 (3) Graduate Colloquium in United States History

Students gain an acquaintance with major works in the field and discuss current issues of interpretation and methodology.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5116 (3) History of U.S. Foreign Relations, 1865-1940

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II. Instructor's permission required for non-history graduate students.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4116

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5125 (3) Early American History to 1763

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4125

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5126 (3) History of U.S. Foreign Relations Since 1941

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4126

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5128 (3) The History of Modern Mexico Since 1821

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4128

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5129 (3) Colloquium in Modern Asian History

Introduces major topics and themes in Asian history. Analyzes readings relating to topics such as imperialism, cultural agency, gender, race, nationalism, decolonization, and revolution.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General
Departmental Category: Asia Content

HIST 5205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

Equivalent - Duplicate Degree Credit Not Granted: HIST 4205

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4215

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5222 (3) War and the European State, 1618-1793

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

Equivalent - Duplicate Degree Credit Not Granted: HIST 4222

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5223 (3) The French Revolution and Napoleon

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades of revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4223

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5235 (3) Jacksonian America

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4235

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5248 (3) History of Anglo-American Criminal Justice

Explores the social, cultural, and legal history of Anglo-American criminal justice from the 17th to the 20th centuries. Also examines tensions between various methods that historians employ to study crime and law.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5303 (3) Venice and Florence during the Renaissance

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5303

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5328 (3) The Modern Middle East, 1600 to the Present

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4328

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5339 (3) Borderlands of the British Empire

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4339

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 5343 (3) Spain and Portugal during the Golden Age

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 5064.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4343

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 5349 (3) Decolonization of the British Empire

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4349

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 5422 (3) World War I in Europe

Examines the origins of World War I; the military, social, and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the twentieth-century world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4422

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5538 (3) History of Modern India

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4538

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 hours of any history coursework.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5544 (3) History of Yiddish Culture

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4544 and JWST 4544

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Europe: Topical

HIST 5548 (3) Women in Modern India

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4548

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5616 (3) History of Gender and Sexuality in the United States to 1870

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities a served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4616 and WGST 4616

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5619 (3) Women in East Asian History

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4619 and WGST 4619

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 5628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics a Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4628

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics, and queer cultural resistance.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4636 and WGST 4636

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5638 (3) Contemporary China: Radicalism and Reform, 1949 to Present

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4638

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5658 (3) China and Islam from the 7th Century to the 20th Century

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4658

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5728 (3) Modern Japanese History

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4728

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5738 (3) History of Early Modern Japan (1590-1868)

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

Equivalent - Duplicate Degree Credit Not Granted: HIST 4738

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4761 and CLAS 4761 and CLAS 5761

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 5840 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 5841 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 5842 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5843 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5844 (1-3) Independent Study-Europe/Topical

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 5845 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5846 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5847 (1-3) Independent Study**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 5848 (1-3) Independent Study****Repeatable:** Repeatable for up to 3.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 5849 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6012 (3) Readings in Modern European History****Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 6019 (3) Readings in World History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6020 (3) Modern Empires: Readings in Imperial History**

Introduces major topics and themes in imperial history. Reviews central theories of modern colonial empire, ranging from economic and political motivations for expansion, to the cultural and social impact of empire, to post-colonialism.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6028 (3) Readings in Modern Latin American History**

Examines major themes and topics in the social, political and economic history of Latin America. Possible topics include nationalism and state-building, neocolonialism, revolution and reaction, race, and gender.

Requisites: Restricted to graduate students only.**Recommended:** Prerequisite HIST 5128.**Additional Information:** Departmental Category: World Areas: Specific Regions**HIST 6030 (3) Readings: Frontiers and Borderlands in the Americas**

Introduces classic and recent scholarship on frontiers and borderlands in the Americas. Chronological focus will vary by semester, from contact through twentieth century. A hemispheric approach encourages comparative insights about topics such as colonialism and ecological change, war and violence, indigenous resistance, acculturation, ethnogenesis, and evolving ideas about race, gender, and identity at the margins of empires and nation-states.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6109 (3) Readings in Asian History**

Explores a specific theme in Asian History in depth. Topic may vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 6113 (3) Readings in English History to 1714**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 6115 (3) Readings in American Colonial History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 6116 (3) Readings in American Diplomatic History****Requisites:** Restricted to graduate students only.**Recommended:** Requisite undergraduate work in American history.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 6123 (3) Readings in English History Since 1688****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 6150 and ARTH 6150 and ANTH 6150**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-).**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 6212 (3) Readings in 17th Century Europe****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 6317 (3) Readings in the American West****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 6326 (3) Readings in United States Intellectual History**

Examines the history of ideas and the social history of intellectuals in American society during the 19th and 20th centuries. Stresses social and political dimensions and the changing cultural and institutional contexts of intellectual discourse.

Requisites: Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 6329 (3) Readings in Comparative Ethnohistory****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: World Areas: Comparable and General**HIST 6330 (3) History of Sex and Sexuality**

Examines major historical trends in the study of meanings and practices of sex and sexuality. Focuses on emergence and negotiation of sexual matters in circumstances where sex and identity were not coterminous.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global

HIST 6349 (3) Decolonization in Transnational Perspective: The End of the British Empire in S Asia & Middle East

Examines Britain's withdrawal from South Asia and the Palestine mandate. Topics include collaboration, anticolonial resistance, Indian and Palestinian nationalisms, zionism, transcolonial connections, counter insurgency, and partition.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 6410 (3) Readings in Environmental History

Offers historical perspective on the complex and interdependent relationship between human social and cultural institutions and the natural world. Considers interdisciplinary methodologies incorporating history, biology, geography, law, and other disciplines. Formerly HIST 6417.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6413 (3) Readings in Modern German History

Requisites: Restricted to graduate students only.

Recommended: Requisite general background in European history.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 6414 (3) Readings in European Intellectual History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 6420 (3) Memory and History in Transnational Perspective

Engages in debates about historical methods and how the past is represented. Central topics will include memory and the forces of nationalism and war; commemoration and monuments; the role of memory in the construction of race and ethnicity; personal past and cultural remembrance; and the relationships between academic, public, and popular histories.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6427 (3) Readings in African American History

Introduces classic and recent scholarship, and critical issues in African American history, from slavery to the present.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 6511 (3) Readings in Medieval History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 6526 (3) Readings in U.S. Social History, 1880--1940

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6528 (3) Reading in South Asian History

Introduces major topics and themes in South Asian history. Reviews central theories relating to topics such as religion, nationalism, law, gender, colonialism, and literature.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 6546 (3) Readings in Cultural History and Theory

Introduces standard works and recent developments in cultural history. Explores structuralism and post-structuralism, semiotics, social construction, relativism, hegemony, and the idea of postmodernity in the uses of culture as an historical category.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6610 (3) Readings in Gender History

Examines the field of gender history that includes an understanding of women's and/or men's experience as lived and socially or culturally constructed. Regional or national focus and time period to be determined by the faculty member teaching the course in any given semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6616 (3) Readings in the History of American Women

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6756 (3) Race and Nationalism

Focuses on analytical, ideological, cultural, and political tensions between understandings of race and nationalism. Readings are interdisciplinary, but students identify and analyze tensions between race and nationalism at particular historical moments.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6800 (3) Readings in Global History

Explores various topics, regions, and methods in history and historical writing by utilizing a global/thematic approach. Geared toward graduate students in History, but students from other disciplines with graduate standing may enroll with instructor consent. Topic and content of course will vary depending on instructor.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 7052 (3) Seminar: Modern European History**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7110 (3) Research Seminar in Atlantic History 1500-1800**

Discusses the concepts and methods that inform the field of Atlantic history in the early modern era. Readings and research papers explore the interactions of peoples from Europe, Africa, and the Americas, including the exchange of ideas, peoples, commodities, and cultural practices.

Requisites: Restricted to graduate students only.**Grading Basis:** Letter Grade**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7119 (3) Graduate Research Seminar in Asian History**

Prepares students for research in historical documents in Asian languages in order to write a substantial original research paper based on primary and secondary source materials.

Requisites: Restricted to graduate students only.**Recommended:** Requisite background in Asian history.**Additional Information:** Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 7153 (3) Seminar: English History, 800--1688**Requisites:** Restricted to graduate students only.**Recommended:** Requisite background in English or European history.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 7155 (3) Seminar: Early American History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7156 (3) Seminar: American Diplomatic History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7252 (3) Seminar: Early Modern Europe, 16th to 18th Centuries****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7257 (3) Seminar: History of the American Frontier****Requisites:** Restricted to History (HIST) graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 7326 (3) Seminar: U.S. Intellectual History****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7415 (3) Graduate Seminar in Modern United States History**

Introduces students to various research approaches and methods in modern U.S. historiography and requires them to produce a substantial and original research paper using both primary and secondary sources.

Repeatable: Repeatable for up to 9.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7424 (3) Research Methods in Medieval/Early Modern European History**

Introduces students to research skills needed to work with historical manuscripts. Students learn to read late medieval/early modern handwriting, explore CU's microfilmed collections of manuscripts, and write a research paper based on the manuscript materials.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Topical**HIST 7485 (3) Seminar: United States History, 1948-Present****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7556 (3) Seminar: American Society and Thought****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7581 (3) Latin Paleography**

Discusses the development of formal scripts from the late Roman Empire to the 15th century. Provides practice in identification, transliteration, and translation of medieval manuscripts.

Requisites: Restricted to graduate students only.**Recommended:** Requisite reading knowledge of Latin.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 7840 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 7841 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 7842 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Modern**HIST 7843 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 7844 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Europe: Topical**HIST 7845 (1-3) Independent Study****Repeatable:** Repeatable for up to 3.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 7846 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 7847 (1-3) Independent Study****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: United States: Topical Courses 2

HIST 7848 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 7849 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Methodological, Comparative, and Global

History - Master of Arts (MA)

At CU Boulder, history graduate students are trained in the central principles and research methods that characterize the discipline of history through class instruction and professional development seminars. They also gain a thorough grounding in their particular geographical area of study as well as an ability to situate that area of study in a larger global context.

All MA students focus their studies in two equally weighted fields:

- a regional/national field (i.e., American/U.S. history, European history or Asian history)
- a global/thematic field, for which students are required to take a variety of courses that examine global and transnational history through specific thematic lenses

For the purposes of the comprehensive examination (portfolio), students are expected to work with their faculty advisors to craft subfields of emphasis within both the regional/national and global/thematic fields.

Students wishing to pursue graduate work in history leading to candidacy for an advanced degree should carefully read the Master's Degree Requirements (p. 866) section carefully. For more information, visit the department's Graduate Students webpage.

Requirements

Admission Requirements

For purposes of admission to the graduate program, the general Graduate Record Examination is required and a score in the 85th percentile or above on the verbal component is generally expected.

Prerequisites

As general preparation for graduate work in history, a broad liberal arts education, as well as a major in history, are desirable, though not specifically required. Candidates for graduate degrees may be required to pursue such fundamental courses in history as the department deems necessary to provide a suitable historical background.

Degree Requirements

The following are special departmental requirements. For more information, visit the department's Graduate Students (<http://www.colorado.edu/history/graduate-students>) webpage.

Most MA course work will be at the 5000, 6000 and 7000 levels. The History Department requires that any MA students interested in taking 4000-level courses for degree credit receive approval from their advisor and the director of graduate studies. All courses completed at CU Boulder must be taken in the Department of History, except for courses recommended by the advisor and approved by the director of graduate studies.

All MA students must complete the following:

Required Courses

HIST 5000	Historical Methods: Introduction to the Professional Study of History	3
A two-semester regional/national field colloquium sequence.		6
HIST 5106	Graduate Colloquium in United States History ("To 1865" and "Since 1865")	
HIST 5012	Graduate Colloquium in European History ("To 1789" and "Since 1789")	
HIST 5129	Colloquium in Modern Asian History ("South Asia" and "East Asia")	

Degree Plans

Plan I: Thesis Option

Thesis-track MA students must complete a total of 24 credit hours of course work, plus 6 credit hours of MA thesis credit (HIST 6950). Of those, a minimum of 12 credit hours must come in each of a student's two fields, regional/national and global/thematic. A comprehensive examination must be passed in the field of study before the degree is granted.

Plan II: Non-Thesis Option

Non-thesis track MA students must complete 30 credit hours of course work without a thesis, including six hours of 7000-level research seminars. Of those, a minimum of 12 credit hours must come in each of a student's two fields, regional/national and global/thematic. A comprehensive examination must be passed in the field of study before the degree is granted.

Language Requirement

For students working in fields of history that require the use of foreign languages, their advisory committees may require a demonstration of language proficiency.

History - Doctor of Philosophy (PhD)

At CU Boulder, history graduate students are trained in the central principles and research methods that characterize the discipline of history through class instruction and professional development seminars. They also gain a thorough grounding in their particular geographical area of study as well as an ability to situate that area of study in a larger global context.

All PhD students focus their studies in two equally weighted fields:

- a regional/national field (i.e., American/U.S. history, European history or Asian history)
- a global/thematic field, for which students are required to take a variety of courses that examine global and transnational history through specific thematic lenses

For the purposes of the comprehensive examination (portfolio), students are expected to work with their faculty advisors to craft subfields of emphasis within both the regional/national and global/thematic fields.

Students wishing to pursue graduate work in history leading to candidacy for an advanced degree should read the Doctoral Degree Requirements (p. 867) section carefully. For more information, visit the department's Graduate Students (<http://www.colorado.edu/history/graduate-students>) webpage.

Requirements

Admission

For purposes of admission to the graduate program, the general Graduate Record Examination is required and a score in the 85th percentile or above on the verbal component is generally expected.

Prerequisites

Students who wish to work toward the PhD degree in history must indicate knowledge of certain fields of history, acquaintance with the fundamental tools of historical scholarship and the ability to do original work. The PhD program does not require the completion of a master's degree, but directly admits those qualified applicants who hold an undergraduate history degree or who have completed appropriate undergraduate history preparation and who have been recommended by the graduate admissions committee.

Residence

At least three years of graduate study, two of which must be spent in residence, are required for the PhD degree.

Degree Requirements

A total of 45 post-baccalaureate credit hours, at least 36 of which must be taken at this university, and a dissertation are required for the degree. A minimum of one foreign language is required; however, students must be able to use those languages essential to research and advanced study in their respective fields. In addition, as required by the Graduate School, those students pursuing a PhD should complete a minimum of 30 credit hours of dissertation work beyond the minimum course work requirement.

A comprehensive written and oral examination, a dissertation that is an original contribution to knowledge and an oral examination on the dissertation must be completed successfully.

Integrative Physiology

The Department of Integrative Physiology offers a variety of graduate study opportunities that range from a coursework-only option to a research-intensive option. To facilitate maximal flexibility in the design of a student's program, the Department has established a minimum number of required courses that must be completed by all graduate students and the remainder of the program can be individualized to meet the long-term goals of the student.

A graduate degree in integrative physiology provides opportunities for careers in academia, industry, and the health professions. The placement list of PhD and MS graduates (<http://www.colorado.edu/intphys/grad/placement.html>) indicates some of the jobs and educational programs that our graduate students have found after completion of the PhD or MS degree.

Course code for this program is IPHY.

Master's Degree

- Integrative Physiology - Master of Science (MS) (p. 1024)

Doctoral Degree

- Integrative Physiology - Doctor of Philosophy (PhD) (p. 1025)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa Abdalla (https://experts.colorado.edu/display/fisid_144736)
Associate Professor; PhD, University of Michigan Ann Arbor

Bartlett, Jamie Lynn (https://experts.colorado.edu/display/fisid_156740)
Lecturer

Bustamante, Heidi Margarita (https://experts.colorado.edu/display/fisid_146491)
Instructor; MS, University of Colorado Boulder

Byrnes, William (https://experts.colorado.edu/display/fisid_100643)
Associate Professor; PhD, University of Wisconsin-Madison

Carey, Cynthia
Professor Emeritus

Casagrand, Janet L (https://experts.colorado.edu/display/fisid_100934)
Senior Instructor; PhD, Case Western Reserve University

DeSouza, Christopher A (https://experts.colorado.edu/display/fisid_107460)
Professor; PhD, University of Maryland College Park Campus

Dickinson, Arthur L.
Professor Emeritus

Eaton, Robert
Professor Emeritus

Ehringer, Marissa A (https://experts.colorado.edu/display/fisid_126595)
Associate Professor; PhD, University of Colorado Denver

Enoka, Roger M (https://experts.colorado.edu/display/fisid_110122)
Professor; PhD, University of Washington

Fleshner, Monika R (https://experts.colorado.edu/display/fisid_103304)
Professor; PhD, University of Colorado Boulder

Foley, Teresa E. (https://experts.colorado.edu/display/fisid_147351)
Instructor; PhD, University of Colorado Boulder

Fowler, John S.
Professor Emeritus

Gleeson, Todd T (https://experts.colorado.edu/display/fisid_105480)
Professor; PhD, University of California-Irvine

Grabowski, Alena Marie (https://experts.colorado.edu/display/fisid_149727)
Assistant Professor; PhD, University of Colorado Boulder

Heisler, Ruth E (https://experts.colorado.edu/display/fisid_103195)
Senior Instructor; MA, University of Colorado Boulder

Hobbs, Steven L (https://experts.colorado.edu/display/fisid_143724)
Instructor; PhD, University of Colorado Boulder

Hoeffler, Charles Albert (https://experts.colorado.edu/display/fisid_153384)
Assistant Professor; PhD, University of Arizona

Johnson, Thomas E (https://experts.colorado.edu/display/fisid_104242)
Professor; PhD, University of Washington

LaRocca, Thomas J (https://experts.colorado.edu/display/fisid_143989)
Instructor; PhD, University of Colorado Boulder

LeBourgeois, Monique Katherine (https://experts.colorado.edu/display/fisid_148411)
Assistant Professor; PhD, University of Southern Mississippi

Link, Christopher D (https://experts.colorado.edu/display/fisid_109073)
Associate Professor; PhD, University of Massachusetts at Amherst

Lowry, Christopher (https://experts.colorado.edu/display/fisid_143371)
Associate Professor; PhD, Oregon State University

Lynch, G. Robert
Professor Emeritus

Mazzeo, Robert (https://experts.colorado.edu/display/fisid_101031)
Associate Professor; PhD, University of California-Berkeley

McQueen, Matthew B (https://experts.colorado.edu/display/fisid_143785)
Associate Professor; DSc, Harvard University

Mood, Dale P.
Professor Emeritus

Moore, Russell (https://experts.colorado.edu/display/fisid_105756)
Professor; PhD, Washington State University

Nelson, Suzanne Linn (https://experts.colorado.edu/display/fisid_142847)
Instructor; MA, University of Colorado Boulder

Norris, David O.
Professor Emeritus

Robichaux, Waldean
Professor Emeritus

Saul, Leif J (https://experts.colorado.edu/display/fisid_116130)
Senior Instructor; PhD, University of California-Berkeley

Seals, Douglas R (https://experts.colorado.edu/display/fisid_103375)
Professor; PhD, University of Wisconsin-Madison

Sherwood, David (https://experts.colorado.edu/display/fisid_105516)
Associate Professor; PhD, University of Southern California

Shi, Jia (https://experts.colorado.edu/display/fisid_143673)
Instructor; PhD, Boston University

Stitzel, Jerry A (https://experts.colorado.edu/display/fisid_102954)
Associate Professor; PhD, Johns Hopkins University

Tsai, Pei-San (https://experts.colorado.edu/display/fisid_115292)
Professor; PhD, University of California-Berkeley

Wright, Kenneth P (https://experts.colorado.edu/display/fisid_125586)
Professor; PhD, Bowling Green State University

Courses

IPHY 5010 (1) Graduate Student Research Forum

Special topics spanning the broad scope of integrative physiology are covered in a seminar-style format. Presentations by current IPHY faculty are augmented by graduate student presentations of thesis and dissertation work.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 5100 (2) Colloquium in Integrative Physiology

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5102 (2) Introduction to Physiology Genomics

Covers recent developments in genomics: a body of revolutionary new approaches that deal with the analysis of all the DNA sequence in the cell. Relies on a genomics text and student presentation/discussion aided by a study guide.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

Recommended: Prerequisite IPHY 5200.

IPHY 5200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4200 and PSYC 5200

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

IPHY 5262 (3) Application of Bioinformatics and Genomics

Explore public websites, databases, and bioinformatic tools that can be used for analysis of genomic data. These include NCBI Resources, genome databases, gene expression databases, tools for nucleotide and algorithms analyses and protein databases. Students develop a mini-grant proposal that is required to incorporate use of some of the tools covered.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

Recommended: Prerequisite IPHY 5200 and IPHY 5102.

IPHY 5300 (3) Statistical Genetics for Complex Traits

Focuses on the methods of mapping complex disease genes in both population and family-based samples. Topics include both linkage and association analyses of qualitative and quantitative phenotypes.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5440 (4) Endocrinology

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4440

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5550 (3) Exercise Biochemistry

Examines the underlying biochemical mechanisms that are responsible for the physiological adaptations to short- and long-term dynamic exercise including carbohydrate, fat, and protein metabolism. The interaction of key biochemical alterations as it relates to disease (diabetes, obesity, and aging) and exercise will be addressed.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

Recommended: Prerequisite IPHY 4650 and one year of general chemistry (lecture + lab).

IPHY 5580 (3) Sleep Physiology

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5600 (3) Immunology

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4600

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

Recommended: Prerequisites one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3470.

IPHY 5720 (4) Neurophysiology

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4720

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Grading Basis: Letter Grade

IPHY 5730 (3) Integrative Motor Control

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4730

Recommended: Prerequisites IPHY 3410 and IPHY 3470.

IPHY 5740 (3) Theory of Motor Skill Learning

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4740

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

IPHY 5800 (4) Advanced Statistics and Research Methods in Integrative Physiology

Introduces advanced statistical techniques important for analyzing data rising in biomedical research, including physiology. Statistical reasoning will be emphasized through problem solving and applications using statistical software packages.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

Recommended: Prerequisite IPHY 2800.

IPHY 5840 (1-6) Graduate Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6010 (1-3) Seminar

Presents special topics in integrative physiology.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6650 (3) Cellular Cardiovascular Physiology

Focuses on the cellular control of cardiac and smooth muscle contraction, at rest and in response to acute and chronic exercise. Addresses certain pathophysiological and physiological adaptive mechanisms.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Recommended: Prerequisite IPHY 4650.

IPHY 6660 (3) Locomotion Energetics and Biomechanics

Critiques and discusses both classic and cutting edge scientific research in the area of terrestrial locomotion.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Recommended: Prerequisites IPHY 4540 and IPHY 4650.

IPHY 6670 (2) Hypothesis Testing in Locomotion Biomechanics

Focuses on the scientific process including formulating and testing hypotheses in studies of locomotion. Students analyze primary articles to determine whether the studies tested hypotheses and to generate new hypotheses that logically follow from previous studies.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 6680 (3) Matlab for Physiological and Biomechanical Research

Introduces Matlab programming skills needed to write and modify programs for data acquisition and analysis, statistics, plotting, and simulation.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6830 (3) Professional Skills for the Research Scientist

Discusses grant and manuscript writing, scientific presentations, peer-review, setting up/directing a research laboratory, research ethics, mentoring and other professional skills.

Requisites: Restricted to Integrative Physiology (IPHY) doctoral students only.

IPHY 6840 (1-3) Research Project

Involves a scholarly investigation of a selected topic using literature and/or experimental techniques. Advisor required.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6940 (1) Master's Degree Candidate

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Grading Basis: Pass/Fail

IPHY 6950 (1-6) Master's Thesis

Must have 4 credit hours and may be repeated up to 6 total credits.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Requisites: Restricted to Integrative Physiology (IPHY) doctoral students only.

Integrative Physiology - Master of Science (MS)

Physiology is the field of biology that deals with function in living organisms. The academic foundation of the department is the knowledge of how humans and animals function at the level of genes, cells, organs and systems. A graduate degree in integrative physiology provides opportunities for careers in academia, industry and the health professions.

Concurrent Degree Program BA/MS in Integrative Physiology

The Department of Integrative Physiology has developed a curriculum that results in simultaneously conferring BA and MS degrees following a five-year course of study. The program has been designed to provide qualified undergraduate students with an opportunity to enhance their knowledge base in the discipline, engage in research, increase their opportunities for employment and make their applications to medical/allied health professional schools more competitive. Candidates for the program are recruited from the undergraduate population of declared integrative physiology majors during the beginning of their junior year. All interested candidates must apply by the second semester of their junior year. To apply, students must have a minimum GPA of 3.30, one letter of recommendation and a faculty mentor. Approximately 3–5 of the applicants will be selected on a competitive basis to begin the program.

Once accepted into the program, a student must maintain a GPA of 3.00 in all course work undertaken. By the completion of their senior year, students must have completed the 116 undergraduate credit hours as

outlined in the concurrent degree plan options. Continuing students must register for at least 5 graduate course credit hours per semester, beginning with the fall semester of their senior year. Students deciding to discontinue the program may do so at any time during their course of study. All credit hours completed toward the concurrent degree program will be counted toward the completion of the requirements for a BA degree in integrative physiology.

The curriculum for all students in the first year of the program is the same and is designed for students to complete their undergraduate requirements (116 credit hours) and 8 of their graduate credit hours. To complete the program in five years, students will be allowed to count 6 credit hours of their graduate work as electives for the undergraduate degree and 6 prespecified credit hours of undergraduate work toward the master's degree.

Requirements

Admission Requirements

Entering graduate students must have an undergraduate preparation equivalent to the basic core curriculum requirements in integrative physiology at the University of Colorado or departmental approval of their academic preparation for graduate study.

All graduate applicants must have an introductory course in statistics or research design. In addition, students should have the knowledge base that would be obtained by completing human anatomy lecture and lab, as well as human physiology lecture and lab courses.

Satisfactory scores on the Graduate Record Examination (general) tests are also required for admission to the department. These scores should be submitted at the time of application.

Deficiencies

If the undergraduate preparation of a prospective graduate student is not adequate, the student may be allowed to pursue graduate study with the understanding that identified deficiencies will be completed. The graduate admissions committee will determine the nature and extent of these deficiencies.

Deficiencies in any area of the undergraduate major may be met by completing approved course work in the subject at CU Boulder or at other institutions. All entering graduate students with deficiencies must satisfy at least one deficiency per semester until all deficiencies are satisfied. Graduate courses taken before removing deficiencies may be accepted for graduate degree credit only if prior approval of the graduate coordinator has been granted.

Course Requirements

Master's candidates entering the graduate program must complete 30 credits to graduate. They may select one of three options:

- Course work only
- Research project: Course work plus 3 research project hours
- Thesis: Course work plus 4 to 6 thesis hours

It is possible, however, to change from one option to another during the program of study.

Students must have a minimum cumulative grade point average of 3.0 in all graduate work taken, and must perform satisfactorily on the comprehensive exam.

Required Courses and Semester Credit Hours

Required Courses

IPHY 5100	Colloquium in Integrative Physiology	2
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	4

Degree Plan Option

Select the course work-only (0 credits), research project (3 credits) or 0-6 thesis (4-6 credits) option.

IPHY 6840	Research Project	
IPHY 6950	Master's Thesis	

Electives

Elective course work to fulfill the 30-credit minimum. 18-24

Total Credit Hours 30

Candidacy for Degree

Within the first semester of study, the student and mentor must prepare a program of study for the student. This program of study may be changed during the residence of the student with the approval of the mentor. It is the student's responsibility to transfer the program of study to the Application for Admission to Candidacy form required for graduation. The Application to Candidacy is due no later than ten weeks prior to defense of the thesis or research project. The original Application to Candidacy form should be submitted to the program assistant for review and approval.

Comprehensive Examination

All candidates are required to complete an examination (oral or written) covering the thesis or research project as well as course work leading to the degree.

Integrative Physiology - Doctor of Philosophy (PhD)

The objectives of the doctoral program are to:

- provide an academic foundation for understanding how humans and other animals function at the level of genes, cells, tissues, organs and systems, and
- develop the professional skills required to become a research scientist.

Requirements

Admission Requirements

To obtain materials for application and for any additional information, visit the Integrative Physiology (<http://www.colorado.edu/intphys/grad>) website.

Entering graduate students must have an undergraduate preparation equivalent to the basic core curriculum requirements in integrative physiology at the University of Colorado or departmental approval of their academic preparation for graduate study.

All graduate applicants must have an introductory course in statistics or research design. In addition, students should have the knowledge base that would be obtained by completing human anatomy lecture and lab, as well as human physiology lecture and lab courses.

Satisfactory scores on the Graduate Record Examination (general) tests are also required for admission to the department. These scores should be submitted at the time of application.

Deficiencies

If the undergraduate preparation of a prospective graduate student is not adequate, the student may be allowed to pursue graduate study with the understanding that identified deficiencies will be completed. The graduate admissions committee will determine the nature and extent of these deficiencies.

Deficiencies in any area of the undergraduate major may be met by completing approved course work in the subject at CU Boulder or at other institutions. All entering graduate students with deficiencies must satisfy at least one deficiency per semester until all deficiencies are satisfied. Graduate courses taken before removing deficiencies may be accepted for graduate degree credit only if prior approval of the graduate coordinator has been granted.

Course Requirements

Students must complete 30 semester hours of course work at or above the 5000 level.

Required Courses and Semester Credit Hours

Required Courses

IPHY 5100	Colloquium in Integrative Physiology (2 academic-year semesters)	4
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	4
IPHY 6830	Professional Skills for the Research Scientist	3
IPHY 8990	Doctoral Dissertation	30

Electives

30 hours of elective course work	30
Total Credit Hours	71

Advisory Committee

The student's advisory committee will consist of the student's mentor (chair of the committee), a faculty member in the student's interest area, and either the graduate coordinator or the chair of the department. The committee will assist the student in developing a program of study.

Preliminary Review

After the first academic year, which usually consists of 16 to 18 hours of course work, the student completes the preliminary review process. The student's advisory committee will perform this review. The preliminary evaluation includes an evaluation of the student's academic status (minimum GPA of 3.0 is required), a detailed proposal of the student's program of study, written input from the student's mentor, and other pertinent materials deemed necessary by the committee.

The outcome of the preliminary review process can be one of three judgments: pass, fail, or probation. A student who passes may continue to pursue the doctoral degree. A student who fails will be dismissed from the doctoral program. A student on probation must complete any deficiencies determined by the committee before continuing to pursue the doctoral degree. Regardless of the outcome, the committee will submit a written report to the graduate coordinator for filing.

Comprehensive Examination

The comprehensive exam will be administered to the student within four semesters of entry into the doctoral program. The format of the

exam, and the composition of the comprehensive exam committee will be determined by the mentor in consultation with the student. The examination will be based on a document that is about 25 pages in length and designed to demonstrate the student's comprehensive knowledge on a topic. The composition of the committee (a minimum of five members) is submitted to the Dean of the Graduate School for approval. Students are given two opportunities to pass the exam. The written portion of the exam is based on the student's course work and requires demonstration of a broad-based knowledge in integrative physiology. Specific areas to be examined are determined by the mentor and the student.

Dissertation

Successful completion of the exam advances the student to doctoral candidate status, and the student may then begin a dissertation. All students must complete a formal written dissertation that conforms to the requirements established by the Graduate School at CU Boulder.

Final Examination

After completion of the dissertation, a final examination is scheduled. The exam consists of a written submission of the dissertation work and an oral defense. The final examination committee consists of at least five members, one of whom must be from outside the department. Three of the members must be Boulder campus resident faculty.

Linguistics

Linguistics is the study of all aspects of human language: how languages make it possible to transmit ideas and feelings; how and why languages are similar and different; how we develop different styles and dialects; what will be required for computers to understand and produce spoken language; and how languages are used in everyday communication as well as in formal settings. Linguists try to figure out what it is that speakers know and do by observing the structure of languages, the way children learn language, slips of the tongue, conversations, storytelling, the acoustics of sound waves and the way people's brains react when they hear speech or read. Linguists also reconstruct prehistoric languages, and try to deduce the principles behind their evolution into the thousands of languages of the world today.

Purpose of the MA Program

The goal of the MA program in Linguistics is to provide students with sufficient knowledge of linguistics to enable them to work in industry and organizations where knowledge of linguistics helps in problem solving. The program also helps students determine in a relatively short time whether they want to make research in linguistics a lifelong career and prepares students who decide to do so to apply to the PhD program at CU or at other institutions.

The main component of the MA program is 30 semester hours of courses (at least 24 of them in linguistics). Students may also choose to write an MA thesis. Students on both the thesis plan and non-thesis plan must take and pass the comprehensive exam in the third or fourth semester of study in order to receive the MA degree. By meeting additional requirements, MA students may also obtain the MA with a certificate in Cognitive Science, Human Language Technology or Culture, Language and Social Practice. Students enrolled in the MA Program for TESOL Professionals (Teaching English to Speakers of Other Languages) have a course of study divided between general linguistics and TESOL, including a practicum.

Purpose of the PhD Program

The goal of the Linguistics doctoral program is to prepare graduates to design and conduct original, empirically based research within a theoretical framework. Doctoral students prepare for careers in academic research and teaching or applied work in industry or other organizations. We encourage doctoral students to begin engaging in research projects early, as these will contribute to developing the research program that will lead to the thesis project. Early projects not only lead to preliminary exam topics and/or publishable papers but also enable students to pilot methods that will be usable for the dissertation project. Early projects may be extensions of coursework and may involve a faculty advisor other than the thesis advisor.

Doctoral students complete a core of required courses that provide a firm foundation in linguistic theory and methods. These courses are supplemented by advanced courses and individual work related to an area of specialization in a field where this Department offers research strengths, e.g., description of Native American and Chadic (Central African) languages, sociolinguistics, interaction and grammar, computational semantics, psycholinguistics, first-language acquisition, phonetics, phonology, functionally-oriented syntax. Doctoral students may complete the CLASP or Human Language Technology certificates. Additionally, students may apply to pursue a joint PhD in Linguistics and Cognitive Science.

Course codes for this program are LING and ESLG.

Master's Degree

- Linguistics - Master of Arts (MA) (p. 1029)

Doctoral Degree

- Linguistics - Doctor of Philosophy (PhD) (p. 1030)

Certificate

- Culture, Language and Social Practice - Graduate Certificate (p. 1031)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bell, Alan
Professor Emeritus

Cowell, James Andrew (https://experts.colorado.edu/display/fisid_107090)
Professor; PhD, University of California-Berkeley

Fox, Barbara (https://experts.colorado.edu/display/fisid_106066)
Professor; PhD, University of California-Los Angeles

Frajzyngier, Zygmunt (https://experts.colorado.edu/display/fisid_104000)
Professor; PhD, Univ of Warsaw (Poland)

Hall, Kira (https://experts.colorado.edu/display/fisid_123111)
Associate Professor; PhD, University of California-Berkeley

Hulden, Mans Elis (https://experts.colorado.edu/display/fisid_154602)
Assistant Professor; PhD, University of Arizona

Hulden, Vilja Paivikki (https://experts.colorado.edu/display/fisid_154910)

Menn, Lise
Professor Emeritus

Michaelis-Cummings, Laura A (https://experts.colorado.edu/display/fisid_105599)

Professor; PhD, University of California-Berkeley

Narasimhan, Bhuvanewari (https://experts.colorado.edu/display/fisid_144863)

Associate Professor; PhD, Boston University

Palmer, Martha (https://experts.colorado.edu/display/fisid_138162)

Professor; PhD, Univ of Edinburgh (Scotland)

Scarborough, Rebecca Anne (https://experts.colorado.edu/display/fisid_143741)

Associate Professor; PhD, University of California-Los Angeles

Shay, Maire Erin Jean (https://experts.colorado.edu/display/fisid_110594)

Asst Professor Adjunct

Taylor, Allan R.
Professor Emeritus

Thomas-Ruzic, Maria L (https://experts.colorado.edu/display/fisid_143443)

Senior Instructor

Courses

LING 5030 (3) Linguistic Phonetics

Introduces practical and theoretical aspects of phonetics. Provides training in recognition and production of speech sounds, and instruction on fundamentals of articulatory, acoustic, and auditory phonetics.

Requisites: Restricted to graduate students only.

LING 5200 (3) Introduction to Computational Corpus Linguistics

Covers computer methods for doing linguistics with on-line corpora. Includes extensive introduction (with lab) to the Python programming language, UNIX corpus tools, concordance programs, syntactic treebanks, propbanks, and corpora for discourse and phonology research.

Requisites: Restricted to graduate students only.

LING 5300 (3) Research in Psycholinguistics

After a general introduction to issues and research methods in psycholinguistics (language production and comprehension, language and cognition, language acquisition), several major current research topics, such as models of speech production and theories of brain specialization for language, are explored.

Recommended: Prerequisite at least one graduate-level course in LING, PSYC or CSCI.

LING 5410 (3) Phonology

Studies sound systems of language. Introduces both principles of organization of sound systems and major kinds of phonological structures found worldwide. Provides extensive practice in applying phonological principles to data analysis.

Recommended: Prerequisite LING 5030.

LING 5420 (3) Morphology and Syntax

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

Equivalent - Duplicate Degree Credit Not Granted: LING 4420

Requisites: Restricted to graduate students only.

LING 5430 (3) Semantics and Pragmatics

Explores fundamental concepts of semantics and pragmatics, including theories of communication and meaning, representation, conversational implications, speech acts, and discourse structure.

Recommended: Prerequisite LING 5420.

LING 5570 (3) Introduction to Diachronic Linguistics

Familiarizes students with terminology, methods, and theories dealing with phenomena of language change through time.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5410.

LING 5610 (3) English Structure for Teachers of English to Speakers of Other Languages

Description of morphological and syntactic categories and structures of English.

Equivalent - Duplicate Degree Credit Not Granted: LING 4610

Requisites: Restricted to graduate students only.

LING 5620 (3) Teaching ESL Pronunciation

Examines the phonetics and phonology of American English (including prosody) and explores techniques for teaching pronunciation skills to non-native speakers. Treats both general issues and specific problems for students from particular language backgrounds.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 3100 or LING 5030 and LING 5410.

LING 5630 (3) Methods and Materials for Teaching English as an Additional Language

Provides an overview of methods and materials for teaching English as an additional language, along with opportunities for students to observe, discuss and analyze these in relation to language teaching principles, linguistic considerations, and global and local contexts. Aimed primarily at the teaching of English to nonnative speaking adults, the course also addresses second and foreign language teaching generally.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5610 or LING 5620.

LING 5800 (3) Open Topics in Linguistics

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

LING 5832 (3) Natural Language Processing

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5832

Requisites: Restricted to graduate students only.

LING 5900 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

LING 5910 (1-3) TESOL Practicum

Provides observation and supervised teaching experiences in classroom and other contexts involving the teaching of English to speakers of other languages, especially adults and young adult learners in settings outside K-12. Meetings provide opportunities to debrief and to consult on teaching practice; help students connect theory, methods and practice; and support a professional teaching portfolio process.

Equivalent - Duplicate Degree Credit Not Granted: LING 4910

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 4610 or LING 5610.

LING 6200 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and PHIL 6310 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Recommended: Prerequisite at least one course at the 3000-level or higher in CSCI, LING, PHIL, or PSYC.

LING 6300 (3) Topics in Language Use

Discusses current issues and research in a selected area related to language use and function. Sample topics include conversational interaction, language policy, language content, and sociolinguistic variation.

Requisites: Restricted to graduate students only.

LING 6310 (3) Sociolinguistic Analysis

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary sociolinguistic analysis, with special emphasis on linguistic variation, diversity and change.

Requisites: Restricted to graduate students only.

LING 6320 (3) Linguistic Anthropology

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 6320

Requisites: Restricted to graduate students only.

LING 6450 (3) Syntactic Analysis

Introduces the major constructs used by formal theories of syntax to capture the relationship between meaning and syntactic form and uses data from diverse languages to explore the universality of these constructs.

Requisites: Restricted to graduate students only.

LING 6500 (3) Issues in Indigenous Languages

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 6500

Grading Basis: Letter Grade

LING 6510 (3) Language Structures

Surveys the structure of one or more languages, emphasizing understanding how parts of the language interact. Designed to supplement courses in which parts of languages are used to illustrate theoretical claims.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites LING 5410 and LING 5420.

LING 6520 (3) Topics in Comparative Linguistics

Students compare and contrast selected structures of languages treated from a typological, genetic, or a real perspective. No special prior knowledge of the subject language is required.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites LING 5410 and LING 5420 and LING 5570.

LING 6560 (3) Language Acquisition

Theories and research methods in first-language acquisition of phonology, morphology, syntax, semantics, and pragmatics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites LING 5410 and LING 5420 and LING 5430.

LING 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

LING 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

LING 7030 (3) Phonetic Theory and Analysis

Provides students with the practical skills and the conceptual framework to do independent research in phonetics (or in other areas relying on phonetic data). Introduces current and traditional issues in phonetic research (both experimental and theoretical) and gives training in analytical methods.

Recommended: Prerequisites LING 5030 and LING 5410.

LING 7100 (3) Field Methods 1

Introduces the process of discovering structure of a language from data obtained directly from its speakers. Emphasizes effectiveness in the field context, rapid recognition of structural features, and preliminary formulation using computational tools.

Recommended: Prerequisites LING 5410 and LING 5420.

LING 7320 (3) Narrative and Identity

Examines the ways in which identities are constructed, contested, and negotiated through narrative practice.

LING 7350 (3) Language and Gender in Cultural Perspective

Examines organizations of language and gender in a variety of societies and cultures from the perspectives of sociolinguistics, linguistic anthropology, and socially-oriented discourse analysis.

LING 7360 (3) Language and Sexuality

Explores the role of language in the social construction and articulation of sexuality.

LING 7410 (3) Phonological Theory

Phonetic and morphophonological representations: distinctive features, segments, prosodic structures, morphological structures. Phonological processes and their interaction. Naturalness conditions.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5410.

LING 7415 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project. Department enforced prerequisites: CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and EDUC 6506 and PHIL 7415 and PSYC 7415 and SLHS 7418

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

LING 7420 (3) Syntactic Theory

Covers various topics in syntactic theory.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5420.

LING 7425 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and PHIL 7425 and PSYC 7425 and SLHS 7428

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506.

LING 7430 (3) Semantic Theory

Current developments in the theory of linguistic semantics. Topics include truth-conditional theories, generative linguistic theories, semantic theories of communicative competence and integration of these theories in development of a combined theory of semantics and pragmatics.

Recommended: Prerequisite LING 5430.

LING 7570 (3) Advanced Diachronic Linguistics

Presents theories of language change. Discusses mechanisms of language change, its trajectories over linguistic categories and items and its relation to theories of grammar and of language variation.

Recommended: Prerequisites LING 5410 and LING 5420 and LING 5570.

LING 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

LING 7800 (3) Open Topics in Linguistics

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

LING 7900 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

LING 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Linguistics - Master of Arts (MA)

The goal of this master's program is to provide students with sufficient knowledge of linguistics to enable them to work in industry and organizations where knowledge of linguistics helps in problem solving. The program also helps students determine in a relatively short time whether they want to make research in linguistics a lifelong career, and prepares students who decide to do so to apply to the PhD program at CU (p. 1030) or at other institutions.

Students wishing to pursue graduate work in linguistics should carefully read the Master's Degree Requirements (p. 866) section of this catalog, as well as the detailed degree requirements available from the department office.

Concurrent Degree Program

BA/MA in Linguistics

The department has a five-year concurrent bachelor's and master's degree program, which is recommended only for the most serious and able graduate students. For further information, see the graduate advisor in the spring of the sophomore year or during the first week of the fall semester of the junior year.

Requirements

Admission Requirements

Applicants should hold a recognized baccalaureate degree, and should have considerable knowledge of a language other than their native language. This knowledge may have been gained by formal study or by use of the language in a country, community or institution where it is the usual means of communication. The department may require formal study of a foreign language by graduate students whose proficiency in this area is less than the equivalent of the college junior level.

GRE scores are required from United States residents; scores are also required from native speakers of English who wish to be considered for fellowship aid. TOEFL scores are normally required from foreign applicants.

Degree Requirements

The master's degree calls for a minimum of three semesters of study, though most students require four semesters. The remaining courses are normally taken at the 5000 level or above.

All students must pass a comprehensive written examination covering general topics in linguistics.

Degree Plans

Plan I: Thesis Option

Students in this plan must complete a total of 30 credit hours, at least 24 of which must be in linguistics, including 4–6 thesis credit hours.

Required Courses

LING 5030	Linguistic Phonetics	3
LING 5410	Phonology	3
LING 5420	Morphology and Syntax	3
LING 5430	Semantics and Pragmatics	3
LING 5570	Introduction to Diachronic Linguistics	3

Electives

Additional courses to fulfill the 30-credit minimum.		11-9
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Thesis

LING 6950	Master's Thesis	4-6
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Total Credit Hours		30
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Plan II: Comprehensive Examination Option

Students in this plan must complete a total of 30 credit hours of course work, at least 24 of which must be in linguistics.

Required Courses

LING 5030	Linguistic Phonetics	3
LING 5410	Phonology	3
LING 5420	Morphology and Syntax	3
LING 5430	Semantics and Pragmatics	3
LING 5570	Introduction to Diachronic Linguistics	3

Electives

Additional courses to fulfill the 30-credit minimum.		15
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Total Credit Hours		30
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Requirements for TESOL Professionals

The MA in linguistics for TESOL professionals is a graduate program in linguistics. The MA will provide a cohesive, professionally oriented program addressing the increased demand for professionalization in the field of teaching English as a second language. The program requires completion of 30 credit hours: 12 in graduate linguistics course, 12 in required TESOL courses, a 3-credit practicum and a 3-credit elective course. A comprehensive examination and teaching portfolio are required.

Linguistics - Doctor of Philosophy (PhD)

The goal of the linguistics doctoral program is to prepare graduates to design and conduct original, empirically based research within a theoretical framework. Doctoral students prepare for careers in academic research and teaching or applied work in industry or other organizations.

We encourage doctoral students to begin engaging in research projects early, as these will contribute to developing the research program that will lead to the thesis project. Early projects not only lead to preliminary exam topics and/or publishable papers, but also enable students to pilot the methods they'll use for the dissertation project. Early projects may be extensions of course work and may involve a faculty advisor other than the thesis advisor.

Students should select a specialization and begin their own research as early as possible. In addition to phonology, syntax, semantics and pragmatics, the department offers specializations in:

- sociolinguistics
- conversation analysis

- historical linguistics
- typological comparison
- Amerindian linguistics
- African linguistics
- linguistic anthropology
- psycholinguistics
- neurolinguistics
- language development
- cognitive linguistics
- computational modeling of language knowledge

Students wishing to pursue graduate work in linguistics should carefully read the Doctoral Degree Requirements (p. 867) section of this catalog and the detailed degree requirements available from the department office.

Requirements

Admission Requirements

Applicants should hold a recognized baccalaureate degree. They should have considerable knowledge of a language other than their native language. This knowledge may have been gained by formal study or by use of the language in a country, community or institution where it is the usual means of communication. The department may require formal study of a foreign language by graduate students whose proficiency in this area is less than the equivalent of the college junior level. GRE scores are required from United States residents; scores are also required from native speakers of English who wish to be considered for fellowship aid. TOEFL scores are normally required from foreign applicants.

To be admitted to the PhD program, students must have completed course work equivalent to:

LING 5030	Linguistic Phonetics	3
LING 5410	Phonology	3
LING 5420	Morphology and Syntax	3
LING 5430	Semantics and Pragmatics	3
LING 5570	Introduction to Diachronic Linguistics	3
LING 6450	Syntactic Analysis	3

Students who do not have this preparation may be admitted to the MA program. They may apply for admission to the PhD program when these requirements are close to completion. Students may be admitted to the PhD program before finishing the MA.

Degree Requirements

Thirty credit hours of course work are normally required for the PhD. Four linguistics courses are required at the 6000 level or above, and the remaining six courses may include up to four courses in other departments appropriate to the specialization.

Electives

Select four of the following linguistics courses:		12
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LING 6450	Syntactic Analysis	
LING 7100	Field Methods 1	
LING 7030	Phonetic Theory and Analysis	
LING 7410	Phonological Theory	
LING 7420	Syntactic Theory	
LING 7430	Semantic Theory	

LING 7570	Advanced Diachronic Linguistics	
Select six courses appropriate to the specialization, up to four of which can be from other departments		18
Total Credit Hours		30

Language Requirement

All PhD students must demonstrate the ability to read linguistic literature in a language other than English.

Preliminary Examination

As a PhD preliminary examination, students submit a data-based research paper at the beginning of the second year in the PhD program.

Comprehensive Examination

The university comprehensive examination requirement is completed in two steps: the completion of a synthesis paper followed by the defense of a dissertation prospectus.

Doctoral Thesis Credits

To complete the requirements for the PhD degree, a student must register for a minimum of 30 dissertation credit hours. These are distinct from the 30 credit hours of course work that are required for the PhD. Distribution of those hours is as follows:

- A student may not register for more than 10 dissertation credit hours in any one semester.
- No more than 10 dissertation credit hours taken in semesters prior to the semester in which the proposal defense is passed may be counted in the 30 dissertation hours required for the PhD.
- No more than 10 dissertation hours of credit taken the semester in which the proposal defense is passed may be included in the 30 dissertation credit hours required for the degree.

Culture, Language and Social Practice - Graduate Certificate

CU Boulder is home to the program in culture, language and social practice (CLASP). This program provides an interdisciplinary forum on language and society for CU students and faculty. This is facilitated through regular colloquia on the subject of language and society, as well as a diverse curriculum of courses offered toward the CLASP graduate certificate.

The CLASP program brings cohesion to empirical and theoretical research currently conducted on campus in varied analytic traditions that focus on the study of culture, language and social practice. These traditions include sociolinguistics, linguistic anthropology, literacy, bilingualism, second language acquisition, language endangerment and revitalization, narrative studies, symbolic interactionism, language variation and change, ethnography of speaking and diverse forms of discourse analysis, such as conversation analysis, critical discourse analysis, interactional sociolinguistics and multimodal discourse analysis.

The program currently has over twenty affiliated faculty members from a variety of schools and departments, among them anthropology, communication, education, French and Italian, German and Slavic, linguistics, political science, Spanish and Portuguese, sociology and speech, language and hearing science.

For more information on the application process and program requirements, visit the CLASP: Culture, Language & Social Practice (<http://www.colorado.edu/clasp>) website.

Certificate Requirements

Twelve credit hours of graduate-level coursework are required for the Graduate Certificate in Culture, Language, and Social Practice. Three credit hours of coursework must come from the list of approved core courses (Group A); six credit hours of coursework must come from the list of elective courses (Group B); and the three remaining credit hours must come from a course in either social theory or research methods (Group C), subject to approval by the CLASP curriculum committee. The course chosen to fulfill the Group C requirement, while not necessarily language-related, should be a methodological or theoretical course that informs the student's research interests in the relationship between language and society. *At least one of the three selected courses from Lists A and B must be from **outside** the student's home department.*

A student may opt to substitute a University of Colorado Boulder MA thesis on the subject of culture, language, and social practice for one of the Group B courses, if approved by the curriculum committee, which is constituted by the CLASP faculty advisor and CLASP director. An independent study may also be substituted for a formal course, if approved by the committee.

A number of new and unlisted seminars on the subject of language and society are taught within individual departments each year. Students should check with the CLASP program director each semester for a list of additional courses that fulfill the requirements. Students wanting to substitute an unapproved course for one of the courses listed below must receive approval from the CLASP curriculum committee.

The acquisition of a CLASP Certificate is dependent on the successful completion of all courses in the academic curriculum with a grade of B or higher.

Group A: Core Courses

Students will choose one core course from the list below.

ANTH/LING 6320	Linguistic Anthropology	3
COMM 6410	Discourse Analysis	3
COMM 6445	Language, Ideology and Identity	3
LING 6310	Sociolinguistic Analysis	3
EDUC 5615	Second Language Acquisition	3
EDUC 5635	Education and Sociolinguistics	3
SPAN 5450	Introduction to Hispanic Linguistics	3

Group B: Elective Courses

Students will choose two elective courses.

Below is a sampling of courses fulfilling this category that have been offered at CU-Boulder in the recent past. These courses are not necessarily offered on a regular basis. They often have rotating faculty members and are subject to change. Students may also substitute an approved independent study with a CLASP faculty member as one of the required electives.

ANTH 6320	Linguistic Anthropology	3
COMM 5210	Readings in Communication Theory	3
COMM 6410	Discourse Analysis	3
COMM 6445	Language, Ideology and Identity	3
COMM 6440	Grounded Practical Theory	3
COMM 6470	Public Deliberation and Dialogue	3

COMM 6740	Theory and Philosophy of Organizing and Organizations	3	ANTH 5530	Theoretical Foundations of Sociocultural Anthropology	3
EDUC 5235	Language and Literacy Across the Curriculum	3	ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	3
EDUC 5425	Introduction to Bilingual/Multicultural Education	3	PSCI 7004	Seminar: Political Theory	3
EDUC 5455	Literacy for Linguistically Different Learners	3	PSCI 7901	Independent Study	1-3
EDUC 5465	Introduction to ESL/Bilingual and Special Education	3	PSCI 7108	Special Topics	3
EDUC 5615	Second Language Acquisition	3	SOCY 5201	Graduate Seminar in Sociological Theory	3
EDUC 5635	Education and Sociolinguistics	3	SOCY 6041	Cultural Sociology	3
EDUC 5425	Introduction to Bilingual/Multicultural Education	3	SOCY 7006	Sociology of Sex and Gender	3
EDUC 5455	Literacy for Linguistically Different Learners	3	SOCY 7036	Feminist Theory	3
EDUC 5465	Introduction to ESL/Bilingual and Special Education	3	SOCY 7131	Seminar in Social Psychology	3
EDUC 5615	Second Language Acquisition	3	WGST 6090	Feminist Theories	3
EDUC 5635	Education and Sociolinguistics	3	WGST 6290	Special Topics in Gender and Sexuality Studies	3
EDUC 8615	Language Issues in Education Research	3	<i>Examples of seminars in methods:</i>		
LING 5900	Independent Study	1-3	ANTH 7300	Seminar: Research Methods in Cultural Anthropology	3
LING 6310	Sociolinguistic Analysis	3	COMM 6030	Qualitative Research Methods	3
LING 6320	Linguistic Anthropology	3	EDUC 7346	Ethnographic Methods in Educational Research	3
LING 6560	Language Acquisition	3	EDUC 8250	Qualitative Methods I	3
LING 7320	Narrative and Identity	3	EDUC 8260	Qualitative Methods II	3
LING 7350	Language and Gender in Cultural Perspective	3	LING 7800	Open Topics in Linguistics	3
LING 7360	Language and Sexuality	3	SOCY 5111	Data 1: Introduction to Social Statistics	3
LING 7800	Open Topics in Linguistics	3	SOCY 6111	Data 2: Data Analysis	3
LING 7900	Independent Study	1-3	SOCY 6121	Qualitative Methods	3
SLHS 4000	Multicultural Aspects of Communication Differences and Disorders	3	SOCY 7026	Feminist Research Methods	3
SLHS 4560	Language Development	3	SOCY 7121	Qualitative Analysis	3
SPAN 5450	Introduction to Hispanic Linguistics	3	WGST 6190	Feminist Methodology	3
SPAN 7130	Seminar: Critical Approaches to Hispanic Literature	1-3			

Group C: Courses in Social Theory and Research Methods

Students will choose one course in either social theory or research methods that is appropriate for their research goals, in consultation with their CLASP faculty advisor.

Below is a working list of possible courses offered in these areas at the University of Colorado, as listed in the catalog. Note that these are not CLASP-approved courses. Unlike the courses specified in Categories A and B, the courses below are listed here as suggestions only, to provide examples of the kinds of seminars that might be used to fulfill this requirement. Because many of these courses are taught by revolving faculty members who are not CLASP-affiliated, the course content is subject to change from semester to semester. In addition, some of these seminars have prerequisites or limit student enrollment on the basis of disciplinary background.

ANTH 5780	Core Course-Cultural Anthropology	3
ANTH 5785	Advanced Seminar in Cultural Anthropology	3
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	3
ANTH 7620	Seminar: Ethnography and Cultural Theory	3
COMM 5210	Readings in Communication Theory	3
COMM 6360	Social and Cultural Theory	3
EDUC 5075	Sociology in Education	3
EDUC 6325	Culture and Ethnography in Education	3
GEOG 6742	Seminar: Cultural Geography	3
HIST 6330	History of Sex and Sexuality	3

Mathematics

PhD Program

The Department of Mathematics offers course work and research leading to the PhD degree in Mathematics. The Department has a diversified graduate faculty with current areas of research in algebra, classical analysis, differential equations, geometry, harmonic analysis, logic and foundations, number theory, probability and stochastic processes, and topology. Further information on the Department and Graduate program may be found on the Department web site <http://math.colorado.edu>.

MA/MS Program

Students may obtain an MA/MS degree as either an undergraduate student through the concurrent bachelor's/master's degree program (see below) or as a graduate student.

As a rule, graduate students are admitted to the PhD program in Mathematics and earn an MA or MS when they complete their PhD comprehensive exam. Students may choose to leave the program with MA/MS degree. Under certain circumstances, students can be admitted to the graduate program for a terminal MA/MS degree, in which case the prerequisites are the same as for the doctoral program.

Course code for this program is MATH.

Master's Degree

- Mathematics - Master of Arts (MA) (p. 1038)

Doctoral Degree

- Mathematics - Doctor of Philosophy (PhD) (p. 1038)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baggett, Lawrence W.
Professor Emeritus

Beaudry, Agnès (https://experts.colorado.edu/display/fisid_157677)
Assistant Professor; PhD, Northwestern University

Black, John (https://experts.colorado.edu/display/fisid_126540)
Associate Professor; PhD, University of California-Davis

Bronstein, Albert
Instructor; PhD, University of Kentucky Lexington

Brown, Gordon E.
Professor Emeritus

Casalaina-Martin, Sebastian Ben (https://experts.colorado.edu/display/fisid_145845)
Associate Professor; PhD, Columbia University In the City of New York

Clelland, Jeanne Nielsen (https://experts.colorado.edu/display/fisid_113103)
Professor; PhD, Duke University

Clements, George F.
Professor Emeritus

Czubak, Magdalena (https://experts.colorado.edu/display/fisid_157955)
Assistant Professor; PhD, University of Texas at Austin

Elliott, Peter D (https://experts.colorado.edu/display/fisid_105048)
Professor; PhD, University of Cambridge (England)

Englander, Janos (https://experts.colorado.edu/display/fisid_147333)
Associate Professor; PhD, Israel Instit of Tech (Israel)

Enoka, Roger M (https://experts.colorado.edu/display/fisid_110122)
PhD, University of Washington

Farsi, Carla Emilia (https://experts.colorado.edu/display/fisid_101437)
Professor; PhD, University of Maryland College Park Campus

Fox, Jeffrey S (https://experts.colorado.edu/display/fisid_105586)
Professor; PhD, University of California-Berkeley

Goodrich, Robert K.
Professor Emeritus

Gorokhovskiy, Alexander (https://experts.colorado.edu/display/fisid_126279)
Professor; PhD, Ohio State University

Grant, David R (https://experts.colorado.edu/display/fisid_100868)
Professor; PhD, Massachusetts Institute of Technology

Green, Richard Mutegeki (https://experts.colorado.edu/display/fisid_129800)
Professor; MA, Oxford Univ (England)

Gustafson, Karl E (https://experts.colorado.edu/display/fisid_104877)
Professor; PhD, University of Maryland College Park Campus

Hermes, Henry G.
Professor Emeritus

Holley, Richard A.
Professor Emeritus

Ih, Su-Ion (https://experts.colorado.edu/display/fisid_141091)
Associate Professor; PhD, Brown University

Jesudason, Judith Packer (https://experts.colorado.edu/display/fisid_100338)
Professor; PhD, Harvard University

Jones, William B.
Professor Emeritus

Kearnes, Keith (https://experts.colorado.edu/display/fisid_118457)
Professor; PhD, University of California-Berkeley

Kuznetsov, Sergei Eugenievitch (https://experts.colorado.edu/display/fisid_113246)
Associate Professor; DSc, Vilnius State Univ (Lithuania)

Liu, Faan Tone
Instructor; PhD, University of Colorado at Boulder

Lundell, Albert T.
Professor Emeritus

Macrae, Robert Eugene
Professor Emeritus

Malitz, Jerome I.
Professor Emeritus

Manley, Kevin W (https://experts.colorado.edu/display/fisid_142342)
Instructor; PhD, University of Colorado Boulder

Mayr, Peter (https://experts.colorado.edu/display/fisid_155858)
Assistant Professor; Dr habil, Johannes Kepler University Linz (Austria)

Monk, James Donald
Professor Emeritus

Mycielski, Jan
Professor Emeritus

O'Rourke, Sean Daniel (https://experts.colorado.edu/display/fisid_154418)
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Pflaum, Markus Josef (https://experts.colorado.edu/display/fisid_144979)
Professor; Dr habil, Humboldt Univ of Berlin (Germany)

Ramsay, Arlan
Professor Emeritus

Rearick, David F.
Professor Emeritus

Roberson, Lee
Instructor; PhD, University of Northern Colorado

Roth, Richard L.
Professor Emeritus

Sather, Duane P.
Professor Emeritus

Schmidt, Wolfgang
Professor Emeritus

Spina, Alejandro (https://experts.colorado.edu/display/fisid_104240)
Senior Instructor; PhD, University of Colorado Boulder

Stade, Eric (https://experts.colorado.edu/display/fisid_100456)
Professor; PhD, Columbia University In the City of New York

Struik, Ruth Rebekka
Professor Emeritus

Szendrei, Agnes Erzsebet (https://experts.colorado.edu/display/fisid_130160)
Professor; DSc, Hungarian Academy of Sciences (Hungary)

Thiem, Franz Nathaniel (https://experts.colorado.edu/display/fisid_144618)
Associate Professor; PhD, University of Wisconsin-Madison

Tubbs, Robert (https://experts.colorado.edu/display/fisid_101761)
Associate Professor; PhD, Pennsylvania State University

Varanasi, Mahesh K (https://experts.colorado.edu/display/fisid_103090)
Professor; PhD, Rice University

Vernerey, Divya E. (https://experts.colorado.edu/display/fisid_145131)
Instructor; PhD, Northwestern University

Walter, Martin E (https://experts.colorado.edu/display/fisid_105263)
Professor; PhD, University of California-Irvine

Wise, Jonathan S (https://experts.colorado.edu/display/fisid_151516)
Assistant Professor; PhD, Brown University

Wolkowisky, Jay H.
Professor Emeritus

Courses

MATH 5000 (3) Foundations of Mathematics

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation. Department enforced prerequisites: MATH 2130 and MATH 3140.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4000

Requisites: Restricted to graduate students only.

MATH 5001 (3) Analysis 2

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

Equivalent - Duplicate Degree Credit Not Granted: MATH 4001

Requisites: Restricted to graduate students only.

MATH 5030 (3) Intermediate Mathematical Physics 1

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory, and Fourier analysis. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5030

Requisites: Restricted to graduate students only.

MATH 5040 (3) Intermediate Mathematical Physics 2

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory and Fourier analysis. Department enforced prerequisite: MATH 5030.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5040

Requisites: Restricted to graduate students only.

MATH 5120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: MATH 2130 or MATH 2135 or APPM 3310. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4120 and APPM 4120 and APPM 5120

Requisites: Restricted to graduate students only.

MATH 5140 (3) Abstract Algebra 2

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra. Department enforced prerequisite: MATH 3140.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4140

Requisites: Restricted to graduate students only.

MATH 5150 (3) Linear Algebra

Highlights vector spaces, linear transformations, eigenvalues and eigenvectors, and canonical forms. Department enforced prerequisite: MATH 2130 or MATH 2135. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5200 (3) Introduction to Topology

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4200

MATH 5230 (3) Differential Geometry of Curves and Surfaces

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4230

Requisites: Restricted to graduate students only.

MATH 5240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4240

Requisites: Restricted to graduate students only.

MATH 5330 (3) Fourier Analysis

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics. Department enforced prerequisite: MATH 4001.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4330

Requisites: Restricted to graduate students only.

MATH 5430 (3) Ordinary Differential Equations

Introduces theory and applications of ordinary differential equations, including existence and uniqueness theorems, qualitative behavior, series solutions, and numerical methods, for scalar equations and systems.

Department enforced prerequisites: MATH 2130 and MATH 3001.

Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5440 (3) Mathematics of Coding and Cryptography

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed; prepares students for the more advanced ECEN 5682.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4440

Requisites: Restricted to graduate students only.

MATH 5470 (3) Partial Differential Equations

Studies initial boundary and eigenvalue problems for the wave, heat and potential equations. Solution by separation of variables, Green's function, and variational methods. Department enforced prerequisite: MATH 3430 or MATH 5430. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4470

Requisites: Restricted to graduate students only.

MATH 5510 (3) Introduction to Probability Theory

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4510

Requisites: Restricted to graduate students only.

MATH 5520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: MATH 4510 or MATH 5510 or APPM 3570.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4520 and APPM 4520 and APPM 5520

Requisites: Restricted to graduate students only.

MATH 5540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: MATH 4520 or MATH 5520 or APPM 4520 or APPM 5520.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4540 and APPM 4540 and APPM 5540

Requisites: Restricted to graduate students only.

MATH 5600 (3) Numerical Analysis 1

Solution of nonlinear algebraic equations, interpolation, approximation theory and numerical integration. Department enforced prerequisites: MATH 2130 or MATH 2135 or APPM 3310 and experience with a scientific programming language. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5610 (3) Numerical Analysis 2

Solution of linear systems, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: MATH 5600 or APPM 5600. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5730 (3) Set Theory

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4730

MATH 5810 (1-3) Special Topics in Mathematics

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4810

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

MATH 5820 (3) History of Mathematical Ideas

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4820

Requisites: Restricted to graduate students only.

Recommended: Requisite completion of upper division Written Communication requirement.

MATH 5905 (1) Mathematics Teacher Training

Designed to train students to become effective teachers. Students teach a mathematics course, meeting weekly with faculty to discuss problems particular to the teaching of mathematics. Department enforced prerequisite: current employment as a teaching assistant.

Requisites: Restricted to graduate students only.

MATH 6000 (3) Model Theory

Proves the compactness theorem, showing the essential finiteness of logical implication. Proves many basic properties of theories, showing how the syntactic form of statements influences their behavior w.r.t., different models. Finally, studies properties of elements that cannot be stated by a single formula (the type of the element) and shows it can be used to characterize certain models.

Requisites: Restricted to graduate students only.

MATH 6010 (3) Computability Theory

Studies the computable and uncomputable. Shows that there are undecidable problems and from there builds up the theory of sets of natural numbers under Turing reducibility. Studies Turing reducibility, the arithmetical hierarchy, oracle constructions and end with the finite injury priority method. Department enforced prerequisite: MATH 6000.

Requisites: Restricted to graduate students only.

MATH 6110 (3) Introduction to Number Theory

Examines divisibility properties of integers, congruences, diophantine equations, arithmetic functions, quadratic residues, distribution of primes and algebraic number fields. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6130 (3) Algebra 1

Studies group theory and ring theory. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6140 (3) Algebra 2

Studies modules, fields and Galois theory. Department enforced prerequisite: MATH 6130. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6150 (3) Commutative Algebra

Introduces topics used in number theory and algebraic geometry, including radicals of ideals, exact sequences of modules, tensor products, Ext, Tor, localization, primary decomposition of ideals and Noetherian rings. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6170 (3) Algebraic Geometry

Introduces algebraic geometry, including affine and projective varieties, rational maps and morphisms and differentials and divisors. Additional topics might include Bezout's Theorem, the Riemann-Roch Theorem, elliptic curves, and sheaves and schemes. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6180 (3) Algebraic Number Theory

Introduces number fields and completions, norms, discriminants and differentials, finiteness of the ideal class group, Dirichlet's unit theorem, decomposition of prime ideals in extension fields, decomposition and ramification groups. Department enforced prerequisites: MATH 6110 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6190 (3) Analytic Number Theory

Acquaints students with the Riemann Zeta-function and its meromorphic continuation, characters and Dirichlet series, Dirichlet's theorem on primes in arithmetic progressions, zero-free regions of the zeta function and the prime number theorem. Department enforced prerequisites: MATH 6110 and MATH 6350. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6210 (3) Introduction to Topology 1

Introduces elements of point-set topology and algebraic topology, including the fundamental group and elements of homology. Department enforced prerequisites: MATH 2130 and MATH 3140 and MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6220 (3) Introduction to Topology 2

Continuation of MATH 6210. Department enforced prerequisite: MATH 6210. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6230 (3) Introduction to Differential Geometry 1

Introduces topological and differential manifolds, vector bundles, differential forms, de Rham cohomology, integration, Riemannian metrics, connections and curvature. Department enforced prerequisites: MATH 2130 and MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6240 (3) Introduction to Differential Geometry 2

Continuation of MATH 6230. Department enforced prerequisite: MATH 6230. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6250 (3) Theory of Rings

Studies semi-simple Artinian rings, the Jacobson radical, group rings, representations of finite groups, central simple algebras, division rings and the Brauer group. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6260 (3) Geometry of Quantum Fields and Strings

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories. Department enforced prerequisites: MATH 6230 and MATH 6240 and PHYS 5250 and PHYS 7280. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 6260

Requisites: Restricted to graduate students only.

MATH 6270 (3) Theory of Groups

Studies nilpotent and solvable groups, simple linear groups, multiply transitive groups, extensions and cohomology, representations and character theory, and the transfer and its applications. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6280 (3) Advanced Algebraic Topology

Covers homotopy theory, spectral sequences, vector bundles, characteristic classes, K-theory and applications to geometry and physics. Department enforced prerequisite: MATH 6220. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6290 (3) Homological Algebra

Studies categories and functors, abelian categories, chain complexes, derived functors, Tor and Ext, homological dimension, group homology and cohomology. If time permits, the instructor may choose to cover additional topics such as spectral sequences or Lie algebra homology and cohomology. Department enforced prerequisites: MATH 6130 and MATH 6140.

Requisites: Restricted to graduate students only.

MATH 6310 (3) Introduction to Real Analysis 1

Develops the theory of Lebesgue measure and the Lebesgue integral on the line, emphasizing the various notions of convergence and the standard convergence theorems. Applications are made to the classical L^p spaces. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6320 (3) Introduction to Real Analysis 2

Covers general metric spaces, the Baire Category Theorem, and general measure theory, including the Radon-Nikodym and Fubini theorems. Presents the general theory of differentiation on the real line and the Fundamental Theorem of Lebesgue Calculus. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite MATH 6310.

MATH 6350 (3) Functions of a Complex Variable 1

Focuses on complex numbers and the complex plane. Includes Cauchy-Riemann equations, complex integration, Cauchy integral theory, infinite series and products, and residue theory. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6360 (3) Functions of a Complex Variable 2

Focuses on conformal mapping, analytic continuation, singularities and elementary special functions. Department enforced prerequisite: MATH 6350. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6534 (3) Topics in Mathematical Probability

Offers selected topics in probability such as sums of independent random variables, notions of convergence, characteristic functions, Central Limit Theorem, random walk, conditioning and martingales, Markov chains and Brownian motion. Department enforced prerequisite: MATH 6310. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6550 (3) Introduction to Stochastic Processes

Systematic study of Markov chains and some of the simpler Markov processes, including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences. Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: APPM 6550

Requisites: Restricted to graduate students only.

MATH 6730 (3) Set Theory

Presents cardinal and ordinal arithmetic, and basic combinatorial concepts, including stationary sets, generalization of Ramsey's theorem, and ultrafilters, consisting of the axiom of choice and the generalized continuum hypothesis. Department enforced prerequisites: MATH 4000 or MATH 5000 and MATH 4730 or MATH 5730. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6740 (3) Forcing

Presents independence of the axiom of choice and the continuum hypothesis, Souslin's hypothesis and other applications of the method of forcing. Introduces the theory of large cardinals. Department enforced prerequisite: MATH 6730. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6900 (1-3) Independent Study

Instructor consent required for undergraduates.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MATH 6940 (1) Master's Degree Candidate

This course is for students preparing for the no-thesis option for a master's degree. The content is set by the students' advisors.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

MATH 6950 (1-6) Master's Thesis**MATH 8114 (3) Topics in Number Theory**

May include the theory of automorphic forms, elliptic curves, or any of a variety of advanced topics in analytic and algebraic number theory. Department enforced prerequisite: MATH 6110. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8174 (3) Topics in Algebra I

Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8250 (3) Mathematical Theory of Relativity 1

Focuses on Maxwell equations, Lorentz force, Minkowski space-time, Lorentz, Poincare, and conformal groups, metric manifolds, covariant differentiation, Einstein space-time, cosmologies, and unified field theories. Instructor consent required.

Requisites: Restricted to graduate students only.

MATH 8304 (3) Topics in Analysis 1

Presents advanced topics in analysis including Lie groups, Banach algebras, operator theory, ergodic theory, representation theory, etc. Department enforced prerequisites: MATH 8330 and MATH 8340. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8330 (3) Functional Analysis 1

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisites: MATH 6310 and MATH 6320. Instructor consent required for undergraduates. See also MATH 8340.

Requisites: Restricted to graduate students only.

MATH 8340 (3) Functional Analysis 2

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisite: MATH 8330. Instructor consent required for undergraduates. See also MATH 8330.

Requisites: Restricted to graduate students only.

MATH 8370 (3) Harmonic Analysis 1

Examines trigonometric series, periodic functions, diophantine approximation and Fourier series. Also covers Bohr and Stepanoff almost periodic functions, positive definite functions and the L^1 and L^2 theory of the Fourier integral. Applications to group theory and differential equations. Department enforced prerequisites: MATH 5150 and MATH 6320. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8714 (3) Topics in Logic 1 and 2

Requisites: Restricted to graduate students only.

MATH 8815 (1-3) Ulam Seminar

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MATH 8900 (1-3) Independent Study

Instructor consent required for undergraduates.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MATH 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School portion of the catalog.

Requisites: Restricted to graduate students only.

Mathematics - Master of Arts (MA)

MA/MS Program

Students may obtain an MA/MS degree as either an undergraduate student through the concurrent bachelor's/master's degree program (see below) or as a graduate student.

As a rule, graduate students are admitted to the PhD program in Mathematics and earn an MA or MS when they complete their PhD comprehensive exam. Students may choose to leave the program with MA/MS degree. Under certain circumstances, students can be admitted to the graduate program for a terminal MA/MS degree, in which case the prerequisites are the same as for the doctoral program.

Concurrent Degree Program

BA/MA in Mathematics

The Department of Mathematics Concurrent Bachelor's/Master's Program leads to both a BA in Mathematics and either an MA in Mathematics or an MS in Applied Mathematics. It allows highly motivated and successful students to experience graduate-level course work earlier in their education than would otherwise be possible, and also allows them to obtain a master's degree in a reduced time period. Students are allowed to count six hours of graduate-level Mathematics Department course work towards both their undergraduate and graduate degree requirements.

The earliest admission to the program is after the successful completion of at least total 45 credit hours and a minimum of two upper division courses from the Department of Mathematics. Students must have at least one year of coursework remaining towards the completion of their undergraduate degree in order to be admitted to the program. Students admitted to the program may not pursue a double degree or a double major; however, outside minors are allowed.

For more information, see http://www.colorado.edu/math/undergraduate/math_advising/documents/concurrentdegreeguidelines2015.pdf

Requirements

Admission Requirements

Applicants must have demonstrated mathematical maturity and accomplishment roughly at the level of a successful mathematics major at CU Boulder. Applicants must also demonstrate mathematical potential: success in courses in advanced calculus and abstract algebra help

demonstrate this potential. General and mathematics GRE subject scores are required for PhD students.

Degree Requirements

Students must complete 30 hours of approved credit. At least 24 credit hours must be completed at the 5000 level or above. A maximum of six credit hours may be completed at the 3000 or 4000 level if approved by the department. Students must take two 2-semester sequences. For fulfillment of all course requirements, mathematics courses must be numbered 5000 or higher excluding MATH 5820.

For the MS degree in applied mathematics, 6–12 credit hours must be in an approved minor program outside the mathematics department, and at least 18 credit hours must be approved inside the mathematics department.

Students should read carefully the materials describing the university requirements in the Graduate School section. The student is responsible for satisfying these requirements at the proper time.

Examinations

To earn an MA degree, a student must pass a master's examination based on the particular program of the student.

Thesis

For the MA degree in mathematics, students can pursue a thesis option, which requires 4–6 credit hours of thesis work, and a thesis defense.

Mathematics - Doctor of Philosophy (PhD)

The Department of Mathematics offers course work and research leading to the PhD degree in mathematics. The department has a diversified graduate faculty with current areas of research in algebra, classical analysis, differential equations, geometry, harmonic analysis, logic and foundations, number theory, probability and stochastic processes, and topology.

For more information, visit the Department of Mathematics (<http://www.colorado.edu/math>) website.

Requirements

Admission Requirements

Applicants must have demonstrated mathematical maturity and accomplishment roughly at the level of a successful mathematics major at CU Boulder. Applicants must also demonstrate mathematical potential: success in courses in advanced calculus and abstract algebra help demonstrate this potential. General and mathematics GRE subject scores are required for PhD students.

Degree Requirements

Students must complete at least 30 credit hours of approved graduate course work and 30 credit hours of thesis work.

Before being admitted to candidacy for the PhD degree in mathematics, a student must take two graduate courses each in algebra, real analysis and geometry/topology en route to passing two out of three preliminary exams in these fields. In addition, the student must take a course in complex analysis. The student must then pass a comprehensive exam.

Students should read the Doctoral Degree Requirements (p. 867) section carefully. The student is responsible for satisfying these requirements at the proper time.

Molecular, Cellular and Developmental Biology

In view of the strong research orientation of the fields involved, the department does not accept applications from students seeking the MA as a terminal degree. The master of arts degree, either with a thesis (Plan I) or without (Plan II), is awarded under special circumstances.

Course code for this program is MCDB.

Doctoral Degree

- Molecular, Cellular and Developmental Biology - Doctor of Philosophy (PhD) (p. 1042)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abbott, Lois A.
Professor Emeritus

Anseth, Kristi S (https://experts.colorado.edu/display/fisid_103471)
Distinguished Professor; PhD, University of Colorado Boulder

Betterton, Meredith D (https://experts.colorado.edu/display/fisid_125396)
Associate Professor; PhD, Harvard University

Blumenthal, Thomas (https://experts.colorado.edu/display/fisid_143346)
Professor; PhD, Johns Hopkins University

Boswell, Robert E (https://experts.colorado.edu/display/fisid_100196)
Professor; PhD, University of Colorado Boulder

Cech, Thomas R (https://experts.colorado.edu/display/fisid_103252)
Distinguished Professor; PhD, University of California-Berkeley

Chen, Zhe (https://experts.colorado.edu/display/fisid_148754)
Asst Research Professor; PhD, University of Colorado Boulder

Copley, Shelley (https://experts.colorado.edu/display/fisid_104067)
Professor; PhD, Harvard University

DeDecker, Brian S (https://experts.colorado.edu/display/fisid_143934)
Senior Instructor

Detweiler, Corrella Scott (https://experts.colorado.edu/display/fisid_128240)
Associate Professor; PhD, University of California-San Francisco

Dowell-Deen, Robin DeAnne (https://experts.colorado.edu/display/fisid_147779)
Assistant Professor; DSc, Washington University

Dubin, Mark W.
Professor Emeritus

Fillman, Christy L. (https://experts.colorado.edu/display/fisid_145115)
Instructor; PhD, University of Colorado Boulder

Garcea, Robert L (https://experts.colorado.edu/display/fisid_146103)
Professor; MD, University of California-San Francisco

Gold, Lawrence (https://experts.colorado.edu/display/fisid_100581)
Professor; PhD, University of Connecticut

Han, Min (https://experts.colorado.edu/display/fisid_105512)
Professor; PhD, University of California-Los Angeles

Harvey, Pamela Ann (https://experts.colorado.edu/display/fisid_148012)
Instructor; PhD, Tufts University

Hoenger, Andreas (https://experts.colorado.edu/display/fisid_142883)
Professor; PhD, Univ of Basel (Switzerland)

Jones, Kevin Robert (https://experts.colorado.edu/display/fisid_102094)
Associate Professor; PhD, University of California-Berkeley

Junge, Harald Jobst (https://experts.colorado.edu/display/fisid_148593)
Assistant Professor; PhD, Philipps University Marburg (Germany)

Klymkowsky, Michael W (https://experts.colorado.edu/display/fisid_101226)
Professor; PhD, California Institute of Technology

Knight, Jennifer Kirsten (https://experts.colorado.edu/display/fisid_101933)
Associate Professor; PhD, University of Michigan Ann Arbor

Kralj, Joel M (https://experts.colorado.edu/display/fisid_153055)
Assistant Professor; PhD, Boston University

Krauter, Kenneth S (https://experts.colorado.edu/display/fisid_107978)
Professor; PhD, Yeshiva University

Kuempel, Peter L.
Professor Emeritus

Leinwand, Leslie Anne (https://experts.colorado.edu/display/fisid_107104)
Distinguished Professor; PhD, Yale University

Martin, Jennifer Mary (https://experts.colorado.edu/display/fisid_110125)
Senior Instructor; PhD, University of Washington

McConkey, Edwin H.
Professor Emeritus

McIntosh, J. Richard
Professor Emeritus

Odorizzi, Charles Gregory (https://experts.colorado.edu/display/fisid_118429)
Associate Professor; PhD, University of California-San Diego

Old, William (https://experts.colorado.edu/display/fisid_103039)
Assistant Professor; PhD, University of Colorado Boulder

Olwin, Bradley Bruce (https://experts.colorado.edu/display/fisid_109888)
Professor; PhD, University of Washington

Orth, James D (https://experts.colorado.edu/display/fisid_152017)
Asst Research Professor; PhD, Mayo Graduate School of Medicine

Pace, Norman R.
Professor Emeritus

Park, Soyeon (https://experts.colorado.edu/display/fisid_151944)
Assistant Professor; PhD, Mayo Graduate School of Medicine

Parker, Roy Robert (https://experts.colorado.edu/display/fisid_151440)
Professor; PhD, University of California-San Francisco

Runner, Meredith
Professor Emeritus

Sawyer, Sara Lea (https://experts.colorado.edu/display/fisid_155218)
Associate Professor; PhD, Cornell University

Shen, Jingshi (https://experts.colorado.edu/display/fisid_146414)
Associate Professor; PhD, Columbia University In the City of New York

Singh, Ravinder (https://experts.colorado.edu/display/fisid_112067)
Associate Professor; PhD, Baylor College of Medicine

Staehelin, L. Andrew
Professor Emeritus

Stowell, Michael (https://experts.colorado.edu/display/fisid_124136)
Associate Professor; PhD, California Institute of Technology

Su, Tin Tin (https://experts.colorado.edu/display/fisid_113847)
Professor; PhD, Carnegie Mellon University

Sueoka, Noboru
Professor Emeritus

Van Blerkom, Jonathan (https://experts.colorado.edu/display/fisid_100545)
Research Professor; PhD, University of Colorado Boulder

Voeltz, Gia Kaarina (https://experts.colorado.edu/display/fisid_143587)
Associate Professor; PhD, Yale University

Wood, William B. III
Professor Emeritus

Xue, Ding (https://experts.colorado.edu/display/fisid_112336)
Professor; PhD, Columbia University In the City of New York

Yarus, Michael J.
Professor Emeritus

Yi, Rui (https://experts.colorado.edu/display/fisid_146697)
Associate Professor; PhD, Duke University

Courses

MCDB 5210 (3) Cell Structure and Function (Lecture and Discussion)

MCDB 5220 (3) Molecular Genetics (Methods and Logic)

Requisites: Restricted to graduate students only.

MCDB 5230 (3) Gene Expression (Lecture and Discussion)

Requisites: Restricted to graduate students only.

MCDB 5250 (3) Topics in Developmental Genetics (Methods and Logic)

Repeatable: Repeatable for up to 6.00 total credit hours.

MCDB 5301 (3) Immunology

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4300

Requisites: Restricted to graduate students only.

MCDB 5310 (3) Microbial Genetics and Physiology

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4310

MCDB 5312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4312

Grading Basis: Letter Grade

MCDB 5350 (3) Microbial Diversity and the Biosphere

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4350

Requisites: Restricted to graduate students only.

MCDB 5361 (3) Evolution and Development

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development).

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4361

MCDB 5425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4425

Requisites: Restricted to graduate students only.

MCDB 5426 (3) Cell Signaling and Developmental Regulation

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4426

MCDB 5427 (3) Biology of the Visual System

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4427

Requisites: Requires prerequisite courses of MCDB 3135 and MCDB 3145 (all minimum grade D-).

MCDB 5441 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4441 and EBIO 4440 and EBIO 5440

Requisites: Restricted to graduate students only.

MCDB 5471 (3) Mechanisms of Gene Regulation in Eukaryotes

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4471

MCDB 5520 (3) Bioinformatics and Genomics

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4520

Requisites: Restricted to graduate students only.

MCDB 5521 (1) Bioinformatics and Genomics Laboratory

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4521

Grading Basis: Letter Grade

MCDB 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4550 and PHYS 4550 and PHYS 5550

MCDB 5560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4560 and PHYS 4560 and PHYS 5560

Grading Basis: Letter Grade

MCDB 5615 (3) Biology of Stem Cells

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4615

Requisites: Restricted to graduate students only.

MCDB 5621 (3) Genome Databases: Mining and Management

Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4621 or CHEM 5621 MCDB 4621

MCDB 5650 (1) Teaching and Learning in Undergraduate Science Courses

Discusses recent research on how students learn and applications to the teaching of undergraduate science courses. Conducted as an interactive workshop, in which active-engagement in learning approaches are modeled and experienced by participants. Open to undergraduate and graduate students. May be used to fulfill the pedagogical training requirement for undergraduate Learning Assistants in upper division science courses. Post-doctoral and faculty auditors are welcome to participate as regular auditors.

MCDB 5651 (3) Developmental Biology

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4650

Requisites: Restricted to graduate students only.

MCDB 5680 (3) Mechanisms of Aging

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4680

Requisites: Restricted to graduate students only.

MCDB 5776 (1) Scientific Ethics and Responsible Conduct in Research

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5776

Requisites: Requires a corequisite course of MCDB 5230 or CHEM 5771.

MCDB 5777 (3) Molecular Neurobiology

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4777

MCDB 5811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4811 and EDUC 4811 and EDUC 6811

Requisites: Restricted to graduate students only.

MCDB 6000 (3) Introduction to Laboratory Methods

Introduces methodology and techniques used in biological research. Designed as a tutorial between a few students and one faculty member. Students are expected to read original research papers, discuss findings, and to plan and execute experiments in selected areas. Open only to MCDB graduate students.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Biological Sciences (MCDB) graduate students only.

MCDB 6440 (1-3) Special Topics in MCD Biology

Acquaints students with various topics not normally covered in the curriculum. Offered intermittently or upon student demand, and often presented by visiting professors.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MCDB 6621 (1) Special Topics in RNA

Reviews and evaluates recent scientific literature in the field of RNA chemistry and biology, including topics in structure, catalysis, bioinformatic approaches and control of gene expression. Primarily for graduate level presentation of special topics by students and research staff.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 6621

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

MCDB 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

MCDB 6950 (1-6) Master's Thesis

Students seeking a master's degree should consult a departmental advisor. Plan I or Plan II is offered.

MCDB 7840 (1-6) Graduate Independent Study

An independent study contract is required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

MCDB 7910 (1) Seminar Practicum

Designed for graduate students to give oral presentations on their thesis research, field questions, respond to critiques, and present background information.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

MCDB 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Molecular, Cellular and Developmental Biology - Doctor of Philosophy (PhD)

Areas of Study

Opportunities for graduate study and original research leading to the PhD degree are available in a variety of areas. The department does not offer a terminal, stand-alone master's degree program. Students enrolled in the doctoral program may earn their master's degree if they decide to leave the program after completing 30 hours of graduate course work and the PhD oral and written comprehensive examination.

Molecular Biology

Includes gene regulation, virology, nucleic acid-protein interactions, chromosome structure and function, chromosome replication, microbial diversity, human genome structure, RNA structure and catalysis.

Cell Biology

Includes cytoskeleton, biophysical cytology, vacuole assembly, analysis of yeast spindle pole bodies and vertebrate centrosomes, synthesis and secretion of glycoproteins and polysaccharides, defense responses in plants and 3-D high resolution reconstruction, biogenesis of mitochondria and chloroplasts, energy metabolism, assembly of membrane protein complexes, cell cycle regulation and checkpoints and signal transduction.

Developmental Biology

Covers mechanisms and regulation of morphogenesis and cell growth, genetic control of development, molecular genetics of embryogenesis, sex determination, ras proteins and vulval development and programmed cell death in nematodes, molecular genetics of *Drosophila* neurobiology, developmental genetics of *Drosophila* and *Caenorhabditis*, neural development in mice, transgenic mice and muscle development and function.

Genetics

Includes genetics of human disease, complex traits, mouse development and invertebrate development.

Requirements

Admission Requirements

The graduate program of the Department of Molecular, Cellular and Developmental Biology is sufficiently flexible to accommodate students with a wide range of training. Students with bachelor's degrees in any of the biological, biochemical or physical sciences are encouraged to apply. Background necessary for the program includes the equivalent of undergraduate courses in cell biology, developmental biology, genetics, organic chemistry, biochemistry, chemical thermodynamics, differential and integral calculus and general physics.

Prerequisites

Students accepted with deficiencies may demonstrate mastery of the required areas by taking appropriate undergraduate courses, by passing advanced-standing examinations or by successfully completing graduate-level courses that require the undergraduate courses as prerequisites. Students admitted generally have independent research experience.

Degree Requirements

A minimum of 30 credit hours of courses numbered 5000 and above, plus 30 credit hours of doctoral thesis, are required. Specific courses depend on the student background and field of specialization.

The faculty of the department offers a variety of courses to help graduate students acquire knowledge in the various areas of study. Further, students are required to work in at least three different laboratories to broaden their education and to help them identify the field of greatest interest for their thesis work.

Advisory Committee

An advisory committee, appointed upon entrance, develops an appropriate curriculum based in part on the student's background. A written preliminary exam consists of a series of courses and exams administered during the first year.

Qualifying Exam

A comprehensive qualifying exam administered at the beginning of the spring semester of the second year includes a written research proposal and an oral defense of the proposal that emphasizes breadth and depth of knowledge as well as an ability to communicate and synthesize facts into a coherent scientific argument.

Thesis

The principal elements in graduate training are defining a thesis problem, investigating this problem with a coherent piece of research that constitutes a substantial contribution to knowledge, and writing a report on this work in the form of peer-reviewed journal articles and a thesis submitted to a departmental committee for approval. After completion of the thesis, each candidate for the PhD degree is required to take a final oral examination on the thesis and related topics, and to present a public seminar.

Teaching

Generally, each candidate for the PhD degree does two semesters of apprentice teaching. This obligation is usually met during the student's first year of graduate study.

Museum and Field Studies

Graduate training in anthropology, art history, history, botany, entomology, paleontology and zoology is provided under the direction of museum faculty in cooperation with cognate departments and the Museum and Field Studies Program. Areas of study include, but are not limited to:

- anthropological interpretation
- diatom taxonomy, systematics and ecology
- southwestern archaeology and ethnology
- plant taxonomy, evolution and phytogeography
- vertebrate paleontology and Cenozoic mammals
- biology of aquatic invertebrates
- systematics and population biology of insects of the Rocky Mountain Region

- plant–insect interactions
- mammalogy

Museum assistantships include support from the Walker Van Riper fund and research support from the Collie and William Henry Burt museum funds. Other financial assistance is available to selected students. Students interested in working toward advanced degrees under the direction of museum faculty may use the contact information above.

Course code for this program is MUSM.

Master's Degree

- Museum and Field Studies - Master of Science (MS) (p. 1045)

Certificate

- Museology - Graduate Certificate (p. 1047)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bowers, M Deane (https://experts.colorado.edu/display/fisid_101746)
Professor; PhD, University of Massachusetts at Amherst

Cameron, Catherine M (https://experts.colorado.edu/display/fisid_108375)
PhD, University of Arizona

Chin, Karen (https://experts.colorado.edu/display/fisid_122666)
Associate Professor; PhD, University of California-Santa Barbara

Covert, Herbert H (https://experts.colorado.edu/display/fisid_101542)
PhD, Duke University

Cruz, Alexander (https://experts.colorado.edu/display/fisid_100402)
PhD, University of Florida

Eberle, Jaelyn J (https://experts.colorado.edu/display/fisid_126544)
Associate Professor; PhD, University of Wyoming

Kociolek, John Patrick (https://experts.colorado.edu/display/fisid_145728)
PhD, University of Michigan Ann Arbor

Lekson, Steve (https://experts.colorado.edu/display/fisid_108312)
Professor; PhD, University of New Mexico

McCain, Christy (https://experts.colorado.edu/display/fisid_145010)
Associate Professor; PhD, University of Kansas

Shannon, Jennifer A. (https://experts.colorado.edu/display/fisid_147612)
Associate Professor; PhD, Cornell University

Tripp, Erin Anne (https://experts.colorado.edu/display/fisid_152313)
Assistant Professor; PhD, Duke University

Courses

MUSM 5011 (4) Introduction to Museum Studies

Provides background in history and literature of museums, their objectives and methods, laboratory exercises in curatorship, exhibition theory, and administration.

Additional Information: Departmental Category: Museum Studies

MUSM 5021 (2-3) Selected Museum Topics

Additional Information: Departmental Category: Museum Studies

MUSM 5030 (3) Museum Education

Surveys and discusses the educational role of museums and informal learning centers. Issues include current trends, learning theories and styles, learning from objects, education programs, diverse audiences, museum/school partnerships, and the role of education in exhibit development.

Additional Information: Departmental Category: Museum Studies

MUSM 5031 (3) Museums and the Public: Exhibit Development

Covers elements of exhibition development and design, up to production and evaluation of exhibit prototypes. The team approach is emphasized. Department enforced prerequisite: restricted to graduate students.

Additional Information: Departmental Category: Museum Studies

MUSM 5041 (3) Museum Administration

Covers theory of organizations and how it applies to museums, application of small business management and nonprofit organizations to museums, marketing and development and grant writing and funding strategies. Department enforced prerequisite: restricted to graduate students.

Additional Information: Departmental Category: Museum Studies

MUSM 5045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4045 and ANTH 5045

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Anthropology

MUSM 5051 (3) Museum Collections Management

Deals specifically with curation and data management. Topics include acquisition practices and problems; organization, management, use and preventive conservation of collections; computer data management of collections.

Additional Information: Departmental Category: Museum Studies

MUSM 5061 (3) Introduction to Scientific Illustration

Intended for students with little to no art background. Focus is on the accurate rendering of scientific subjects for publication and for public display. Course begins with basic drawing skills and sharpening of visual perception. Students progress to be able to produce realistic renderings of subjects. Students are exposed to a variety of black and white and color techniques and the standards for presenting illustrations for a variety of audiences. Course concludes with computer illustration tools and techniques.

Additional Information: Departmental Category: Museum Studies

MUSM 5474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4474 and GEOL 5474

Additional Information: Departmental Category: Geology

MUSM 5484 (3) Museum Field Methods in Geology

Paleontological and paleoecological field techniques including collecting; recording of geographic, stratigraphic and quarry information; preservation; interpretation, including applicable readings. Designed for individuals who have some background in geology but little or no prior field experience. Offered summer only.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4484

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geology

MUSM 5760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4760 and EBIO 5760

Additional Information: Departmental Category: Zoology

MUSM 5795 (3) Field Methods in Zoology and Botany

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods, and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4795 and ENVS 4795

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Zoology

MUSM 5900 (1-6) Graduate Independent Study

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4900

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

MUSM 5912 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4912 and ANTH 4470 and ANTH 5470

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Anthropology

MUSM 5913 (3) Museum Practicum in Botany

Students take part in curatorial procedures of the botany section of the museum: specimen preparation, labeling, identification, cataloguing, conservation and collection management. Enrollment is limited therefore students should make arrangements during the previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4913

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Botany

MUSM 5914 (3) Museum Practicum in Geology

Students take part in curatorial procedures of the geology section of the museum: field collection, specimen preparation, cataloguing, collection management and a survey of current laws as they apply to specimens. Enrollment is limited therefore students should make arrangements during the previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4914

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Geology

MUSM 5915 (1-3) Museum Practicum in Zoology

Students take part in basic curatorial procedures of the zoology section of the museum: relaxing, fixing, positioning, preserving, cataloguing, storing and shipping. Also introduces students to the animal kingdom.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4915

Additional Information: Departmental Category: Zoology

MUSM 5916 (1-3) Museum Practicum in Entomology

Students take part in curatorial procedures of the entomology section of the museum: field collection, specimen preparation, labeling, identification, rearing techniques and exhibit preparation. Enrollment is limited, students should make arrangements during previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4916

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Entomology

MUSM 5917 (1-3) Museum Practicum in Techniques

Students participate in museum public education functions that may include researching, planning, developing, and producing exhibits, traveling trunks, booklets, and other materials. May involve writing labels, molding and casting, conservation, and restoration.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4917

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Museology

MUSM 5918 (3) Museum Practicum in Advanced Collections Management

Provides a hands-on environment for exploring issues in museum collections management. Through lecture, resource procurement, in-class activities and out-of-class projects, students will gain practical and professional experience in areas of policy, procedure, best practices, museum storage planning and legal issues.

Recommended: Prerequisite MUSM 5051.

Additional Information: Departmental Category: Museum Studies

MUSM 6110 (1-3) Seminar in Museum Issues

Offers a weekly seminar for museum and field study students that addresses one new topic each semester relevant to museum operations such as archival administration, museums, multiculturalism, repatriation and others. Department enforced prerequisite: MUSM 5011.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Museum Studies

MUSM 6150 (3) Critical and Theoretical Issues in Museums

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present. Department enforced prerequisite: MUSM 5011.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 6150 and HIST 6150 and ANTH 6150

Additional Information: Departmental Category: Museum Studies

MUSM 6930 (2-4) Museum Internship

Provides experience in museums of different sizes, audiences, and subjects, including history, natural history, art, and children's museums. Each student is supervised individually by a faculty member as well as the appropriate person in the cooperating museum.

Additional Information: Departmental Category: Museum Studies

MUSM 6940 (1-4) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Museum Studies

MUSM 6950 (1-6) Master's Thesis in Museum and Field Studies

A thesis, which may be of a research, expository, critical or creative type, is required of every master's degree candidate under the thesis option. Department enforced prerequisites: MUSM 5011 and MUSM 5051 and one of the following: MUSM 5030 or MUSM 5031 or MUSM 5041.

Additional Information: Departmental Category: Museum Studies

MUSM 6960 (1-4) Master's Project or Paper in Museum and Field Studies

A project or paper in the student's discipline and related to some aspect of museum studies is required of every master's degree candidate under the non-thesis-option plan. Department enforced prerequisites: MUSM 5011 and MUSM 5051. Students in collections/field track also need MUSM 5030 or MUSM 5031 or MUSM 5041.

Additional Information: Departmental Category: Museum Studies

Museum and Field Studies - Master of Science (MS)

The interdisciplinary museum and field studies program is administered by the University of Colorado Museum of Natural History, in conjunction with the departments of anthropology; history; art history; ecology and evolutionary biology; and geological sciences; as well as other departments. The program provides a strong background in a chosen field as well as theoretical and practical grounding in museology.

Internships are offered at a variety of museums in the region, including natural history, history and art museums. Students completing the MS are trained as collection managers, curatorial assistants, registrars, museum educators, exhibit technicians and administrators.

Program Tracks

Three tracks are available: a collections/field track, a public/administration track and an art history track.

Collections/Field Track

This track offers training for students interested in the curatorial and research aspects of museum work, such as floristic or faunistic studies of the past and present, material culture of the past and present and biological inventory. The curriculum gives students academic training

as well as experience in all areas of museum work. Field experience is offered through the curatorial and field practica.

Public/Administration Track

This track offers education for students interested in the public aspects of the museum such as program development and evaluation, exhibition planning and design, education and the organization and management of museums. The curriculum offers both academic training in a discipline and hands-on experience with all aspects of the public museum.

Art History Track

The art history track in the MFS program is open to applicants who hold a BA degree in the liberal arts, preferably with a major in art history. This track addresses issues specific to the research and curation of artworks. The curriculum provides students with academic training in art history and offers students firsthand museum experience in curatorial and collections work through exhibitions practica and collections research.

Requirements

Admission Requirements

Students must meet all university requirements for admission to graduate school and have a baccalaureate degree and at least a B (3.00) grade-point average in previous academic work. The baccalaureate degree should be in anthropology, biology, geology, geography, history (including archival studies), classics, fine arts or education, although other majors will be considered. Acceptance to the program is decided by the admissions committee of the University Museum in consultation with the student's department. The student must be accepted by an advisor in his or her discipline. Applicants accepted for graduate work by museum faculty must be admitted to the Graduate School.

Course Requirements

The degree in museum and field studies is a two-year program requiring a total of 32 credit hours, plus 150 hours of internship. Depending on the track and plan, students complete from 9 to 15 credit hours in a department and from 13 to 22 credit hours in museology courses.

Program Tracks

Collections/Field Track

Thesis Plan Course Requirements

Required Courses

MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
MUSM 6110	Seminar in Museum Issues	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	

Further course work

5000+: Cognate Hours ¹		19
MUSM 6950	Master's Thesis in Museum and Field Studies	
Seminar, Independent Study, Practicum (1-3 credits)		

Total Credit Hours 32

¹ Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

Project Plan Course Requirements

Required Courses

MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
MUSM 6110	Seminar in Museum Issues	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	

Further course work

5000+: Cognate Hours ¹		19
MUSM 6960	Master's Project or Paper in Museum and Field Studies	

Total Credit Hours 32

¹ Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

Public/Administration Track

Thesis Plan Course Requirements

Required Courses

MUSM 5011	Introduction to Museum Studies	4
MUSM 5041	Museum Administration	3
MUSM 5051	Museum Collections Management	3
MUSM 6110	Seminar in Museum Issues	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	

Further course work

5000+: Cognate Hours ¹		16
MUSM 6950	Master's Thesis in Museum and Field Studies	
Seminar, Independent Study, Practicum (1-3 credits)		

Total Credit Hours 32

¹ Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

Project Plan Course Requirements

Required Courses

MUSM 5011	Introduction to Museum Studies	4
MUSM 5030	Museum Education	3
MUSM 5031	Museums and the Public: Exhibit Development	3
MUSM 5041	Museum Administration	3

MUSM 5051	Museum Collections Management	3
MUSM 6110	Seminar in Museum Issues	3
Further course work		13
5000+: Cognate Hours ¹		
MUSM 6960	Master's Project or Paper in Museum and Field Studies	
Total Credit Hours		32

¹ Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

Art History Track

Thesis Plan Course Requirements

Required Courses

MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
ARTH 6929	Seminar: Theories of Art History	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
Further course work		19
5000+: Cognate Hours ¹		
MUSM 6950	Master's Thesis in Museum and Field Studies Seminar, Independent Study, Practicum (1-3 credits)	
Total Credit Hours		32

¹ Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

Project Plan Course Requirements

Required Courses

MUSM 5011	Introduction to Museum Studies	4
MUSM 5051	Museum Collections Management	3
ARTH 6929	Seminar: Theories of Art History	3
At least one of the following:		3
MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
Further course work		19
5000+: Cognate Hours ¹		
MUSM 6960	Master's Project or Paper in Museum and Field Studies Seminar, Independent Study, Practicum (3 credits)	
Total Credit Hours		32

¹ Cognate (or specialty) hours may include 5000+ level courses, practicum work, field methods courses, and up to six hours of 3000- or 4000-level classes, if appropriate. Cognate hours may be taken in more than one department or school. Some Museum courses may count as cognate hours with advisor approval.

Internship

A museum internship of 150 hours is required.

Committee

A committee of at least three graduate faculty will be selected during the first semester in residence, by consultation between the student, the student's advisor, and the director of the MFS program. At least one member of the committee must be a tenured or tenure-track member of the museum faculty. The committee will serve as program advisors for the comprehensive exam and as the defense committee for the thesis or project. A student and advisor may apply for an exception in writing, which must be approved by the MFS program director.

Degree Plans

Students may choose either the thesis or non-thesis plan.

Plan I: Thesis Option

This plan requires the completion and successful defense of a thesis.

Plan II: Non-Thesis Option

This plan requires the completion of a project and paper.

Museology - Graduate Certificate

Providing professional museum training for CU Boulder graduate students and for museum professionals who seek to upgrade their skills and credentials, the Professional Certificate in Museology serves a range of disciplines in the arts and sciences, education and engineering, as well as the Colorado museum community.

CU Graduate Students

The Museum and Field Studies program offers a Graduate Professional Certificate in Museology for graduate students. This program provides professional training and certification for students at the University of Colorado Boulder whose primary enrollment is in a graduate program in another museum-related discipline (e.g., Anthropology, Art, Art History, Biology, Business Administration, Education, Geological Sciences, History, etc.). For graduate students in other university departments, the coursework in a cognate discipline is provided by MA/MS or PhD programs in their home department.

Museum Professionals

Additionally, the Professional Certificate program is open to museum professionals in Colorado and the surrounding Rocky Mountain region. The program provides an avenue for early and mid-career museum staff to upgrade their skills and credentials in order to better meet the challenges and opportunities that museum work affords in the 21st century. For museum professionals, additional disciplinary work is available as appropriate upper division undergraduate or graduate course work taken as electives under the nondegree study plan available in the ACCESS program through Continuing Education.

Requirements

The Professional Certificate in Museology requires a minimum of 12 credit hours and a 75-hour internship that may be waived if comparable professional experience is demonstrated.

Required Courses

MUSM 5011	Introduction to Museum Studies	4
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Electives		8
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Select three of the following five courses:

MUSM 5030	Museum Education	
MUSM 5031	Museums and the Public: Exhibit Development	
MUSM 5041	Museum Administration	
MUSM 5051	Museum Collections Management	
MUSM 6110	Seminar in Museum Issues	

Total Credit Hours		12
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Philosophy

Applicants for admission to the Graduate School for work toward a master's or doctoral degree with a major in philosophy are expected to have had 18 or more credit hours in undergraduate courses in the subject.

Students in the master's and doctoral programs must satisfy a variety of requirements, including the completion of course work. The department has a diversified faculty that can supervise the writing of a master's theses and doctoral dissertations on a wide range of topics.

The department makes available a limited number of teaching assistantships and assists with job placement. Descriptions of all degree programs are available from the Department of Philosophy.

Students wishing to pursue graduate work in philosophy should note Master's Degree Requirements (p. 866) and Doctoral Degree Requirements (p. 867), and should obtain a copy of the *Graduate Program Rules* from the department.

Course code for this program is PHIL.

Master's Degree

- Philosophy - Master of Arts (MA) (p. 1051)

Doctoral Degree

- Philosophy - Doctor of Philosophy (PhD) (p. 1053)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bailey, Dominic T. J. (https://experts.colorado.edu/display/fisid_145110)
Associate Professor; PhD, University of Cambridge (England)

Boonin, David Isaac (https://experts.colorado.edu/display/fisid_113100)
Professor; PhD, University of Pittsburgh

Boonin, Leonard
Professor Emeritus

Bredeson, Garrett Zantow (https://experts.colorado.edu/display/fisid_154933)
Instructor

Chapman, Andrew David (https://experts.colorado.edu/display/fisid_153016)
Lecturer

Cleland, Carol (https://experts.colorado.edu/display/fisid_105674)
Professor; PhD, Brown University

Fileva, Iskra Nikova (https://experts.colorado.edu/display/fisid_154600)
Assistant Professor; PhD, Boston University

Fisher, John
Professor Emeritus

Forbes, Graeme R (https://experts.colorado.edu/display/fisid_143615)
Professor; DPhil, Oxford Univ (England)

Hale, Benjamin Slater (https://experts.colorado.edu/display/fisid_141456)
Associate Professor; PhD, SUNY at Stony Brook

Heathwood, Christopher Charles (https://experts.colorado.edu/display/fisid_141144)
Associate Professor; PhD, University of Massachusetts at Amherst

Hosein, Adam Omar (https://experts.colorado.edu/display/fisid_147427)
Assistant Professor; PhD, Massachusetts Institute of Technology

Huemer, Michael (https://experts.colorado.edu/display/fisid_113081)
Professor; PhD, Rutgers University Newark Campus

Jaggard, Alison M (https://experts.colorado.edu/display/fisid_100454)
Professor; PhD, SUNY at Buffalo

Kaufman, Daniel Patrick (https://experts.colorado.edu/display/fisid_134174)
Associate Professor; PhD, University of Massachusetts at Amherst

Lee, Mi-Kyoung (https://experts.colorado.edu/display/fisid_141821)
Associate Professor; PhD, Harvard University

Miller, Ed
Professor Emeritus

Mills, Claudia
Professor Emeritus

Morrison, Wes
Professor Emeritus

Norcross, Alastair J. (https://experts.colorado.edu/display/fisid_144850)
Associate Professor; PhD, Syracuse University

Oddie, Graham James (https://experts.colorado.edu/display/fisid_104741)
Professor; PhD, University of London (England)

Pasnau, Robert C (https://experts.colorado.edu/display/fisid_115293)
Professor; PhD, Cornell University

Potter, Jason Timothy (https://experts.colorado.edu/display/fisid_103972)
Instructor

Rupert, Robert D (https://experts.colorado.edu/display/fisid_139802)
Professor; PhD, University of Illinois at Chicago

Saucedo Ceballos, Raul (https://experts.colorado.edu/display/fisid_153759)
Assistant Professor; PhD, Cornell University

Sturgis, Daniel (https://experts.colorado.edu/display/fisid_111794)
Senior Instructor; PhD, University of Colorado Boulder

Tooley, Michael (https://experts.colorado.edu/display/fisid_100932)
Professor; PhD, Princeton University

Wingo, Ajume H (https://experts.colorado.edu/display/fisid_144391)
Associate Professor; PhD, University of Wisconsin-Madison

Youkey, David A (https://experts.colorado.edu/display/fisid_105211)
Instructor; PhD, University of Colorado Boulder

Zimmerman, Michael
Professor Emeritus; PhD, Tulane University

Courses

PHIL 5010 (3) Single Philosopher

Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4010

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5020 (3) Topics in the History of Philosophy

Examines a specific philosophical problem over an extended historical period.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5030 (1) Greek Philosophical Texts

Selected readings in classical philosophy, with a focus on achieving fluency in reading philosophical Greek. May enroll in multiple sections in the same term.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

PHIL 5040 (1) Latin Philosophical Texts

Selected readings in classical and medieval authors, in the original language. The focus is on achieving fluency in reading philosophical Latin.

Repeatable: Repeatable for up to 7.00 total credit hours.

PHIL 5100 (3) Ethics

Presents representative positions in normative ethics and metaethics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5110 (3) Contemporary Moral Theory

Provides an in-depth look at some recent work in moral theory. Topics covered, varying from year to year, include: consequentialism and its critics; virtue theory; moral psychology; impartiality and the personal point of view.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4110

Requisites: Restricted to graduate students only.

PHIL 5120 (3) Philosophy and Animals

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5120

Requisites: Restricted to graduate students only.

PHIL 5200 (3) Contemporary Political Philosophy

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5210 (3) Philosophy and Social Policy

Studies philosophical approaches to social and political issues such as abortion, bioethics, environmental preservation, human rights, and reverse discrimination. Gives attention to strengths and weaknesses of philosophical treatments of these issues.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5230 (3) Bioethics and Public Policy

Examines public policy implications of contemporary biological, genetic, biomedical, and behavioral science in light of ethics and human values. Considers theoretical and practical grounds for moral assessment of scientific research and possible applications of technology.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5240 (3) Seminar in Environmental Philosophy

Philosophical examination of several different approaches to environmental problems: economic, juridical, political and ecological. Discusses specific environmental problems, focusing on their moral dimensions, e.g., wilderness preservation, animal rights and land use and urban planning.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5240

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5260 (3) Philosophy of Law

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4260

Requisites: Restricted to graduate students only.

PHIL 5290 (1-3) Topics in Values and Social Policy

Deals with topics in the area of philosophy and public policy and is often interdisciplinary in focus. Topics vary from one semester to another.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5300 (3) Philosophy of Mind

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4300

Requisites: Restricted to graduate students only.

PHIL 5340 (3) Epistemology

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

Equivalent - Duplicate Degree Credit Not Granted: 4340

PHIL 5360 (3) Metaphysics

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4360

Requisites: Restricted to graduate students only.

PHIL 5370 (3) Free Will and Determinism

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4370

PHIL 5400 (3) Philosophy of Science

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4400

Requisites: Restricted to graduate students only.

PHIL 5440 (3) Topics in Logic

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4450 and PHYS 5450 and PHYS 5450

Requisites: Restricted to graduate students only.

PHIL 5460 (3) Modal Logic

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4460

Requisites: Restricted to graduate students only.

PHIL 5470 (3) Probability and Rational Choice

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons and Schelling points) and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4470

Requisites: Restricted to graduate students only.

PHIL 5490 (3) Philosophy of Language

Examines theories and problems regarding the nature of language and its relation to reality. Concepts discussed include sense, reference, conventions, intentions and their relation to science and social life. Relevant literature includes readings in Frege, Russell, Quine, Putnam, Kripke and Chomsky.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4490

Requisites: Restricted to graduate students only.

PHIL 5500 (3) Advanced Formal Semantics

Considers topics in the semantics of natural language not normally covered in first courses in philosophy of language. These include: natural deduction and sequent calculi for conditional logic; interpretation as logical inference; Lambek calculus and applicative categorial grammar; applications such as generalized coordination, plurals, higher-order intensional logic, generics, focus, and event-based semantics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHIL 5490.

PHIL 5550 (3) Metaphysics and Epistemology Proseminar

Covers seminal classic texts and/or fundamental topics in analytic metaphysics and epistemology.

Requisites: Restricted to Philosophy graduate students only.

PHIL 5600 (3) Philosophy of Religion

Studies topics falling under philosophy of religion, such as proofs for God's existence, religious language, mysticism, psychology of religion, modern theological movements, miracles, and study of individual theologians.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5700 (3) Aesthetics

Analyzes the principal topics of aesthetics, including such issues as formal structure of aesthetics, the nature of critical judgments, and the status of the work of art.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5800 (3) Open Topics in Philosophy

Variety of new courses at the 5000 level. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5810 (1-3) Special Topics in Philosophy

Instructor meets regularly with three or more students to discuss special topics in philosophy.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5840 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 6000 (3-4) Seminar in the History of Philosophy

Studies advanced topics in the history of philosophy. Content varies by semester, but may extend to any period in the history of philosophy, from the Presocratics into the modern era.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 6100 (3) Seminar in Ethics

Intensive study of selected topics in ethical theory.

Requisites: Restricted to graduate students only.

PHIL 6200 (3) Seminar in Social and Political Philosophy

Provides an in-depth look at some particular topic in social and political philosophy, such as rights, political freedom, political obligation, or democracy.

Requisites: Restricted to graduate students only.

PHIL 6300 (3) Seminar in Philosophy of Mind

Studies selected topics in philosophy of mind.

Requisites: Restricted to graduate students only.

PHIL 6310 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and LING 6200 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Recommended: Prerequisite at least one course at the 3000 level or higher in computer science, linguistics, philosophy, or psychology.

PHIL 6340 (3) Seminar in Epistemology

Studies some of the main topics of epistemology, such as skepticism, foundations of knowledge, perception, introspection, belief, certainty, and analytic-synthetic distinctions.

Requisites: Restricted to graduate students only.

PHIL 6380 (3) Seminar in Metaphysics

Traditional and contemporary theories of the basic categories used to describe nature and the human relationship to it, including such concepts as substance, identity, space and time, causality, determination, and systematic ontology.

Requisites: Restricted to graduate students only.

PHIL 6400 (3) Seminar in Philosophy of Science

Topics connected with development of nature of science: the structure of scientific theories, the testing of hypotheses, the theory of decisions in science and the basic conceptions and models of abstraction in the history of science.

Requisites: Restricted to graduate students only.

PHIL 6490 (3) Seminar in Philosophy of Language

Studies some of the main topics in the philosophy of language, such as meaning and theories of meaning, translation, speech acts, rules of language, reference, relevance of psycholinguistics, language and thought, and language and ontology.

Requisites: Restricted to graduate students only.

PHIL 6940 (1) Master's Candidate for Degree

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Philosophy graduate students only.

Grading Basis: Pass/Fail

PHIL 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Philosophy graduate students only.

PHIL 7415 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for graduate students pursuing a joint PhD in an approved core discipline and cognitive

Requisites: Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

PHIL 7425 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and LING 7425 and PSYC 7425 and SLHS 7428

Requisites: Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

Recommended: Prerequisite EDUC 6505 or PHIL 6310.

PHIL 7810 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and LING 7775 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Philosophy graduate students only.

Philosophy - Master of Arts (MA)

Applicants for admission to the Graduate School for work toward a master's degree with a major in philosophy are expected to have had 18 or more credit hours in undergraduate courses in the subject.

Students in the master's program must satisfy a variety of requirements, including the completion of course work. The department has a diversified faculty that can supervise the writing of a master's theses and doctoral dissertations on a wide range of topics. The department makes available a limited number of teaching assistantships and assists with job placement.

Students wishing to pursue graduate work in philosophy should note the Graduate School requirements in the Master's Degree Requirements (p. 866) section and obtain a copy of the *Graduate Program Rules* from the department.

Concurrent Degree Program BA/MA in Philosophy

The Philosophy Department offers a five-year program that leads to the concurrent awarding of both the BA and MA in philosophy. Students

who successfully complete this program receive the two degrees simultaneously, normally at the end of their fifth year of study.

To complete the concurrent BA/MA program, the student will fulfill separately all requirements for the BA and thesis-based MA, with the exception that two 4000-level courses can satisfy requirements for both the BA and the MA. In addition to these two overlapping 4000-level courses, the student must complete all of the remaining requirements for the general major in philosophy (p. 444), as well as all of the remaining requirements for the thesis-based MA in philosophy.

For more information, see the department's Concurrent BA/MA Program (<http://www.colorado.edu/philosophy/undergraduate/concurrent-ba-ma-program>) webpage.

Requirements

Degree Plans

Plan I: Thesis Option

The MA requires:

- 30 hours of approved graduate study at the 5000 level or above (philosophy courses taken below the 5000 level may be taken as PHIL 5810),
- demonstrated proficiency in the core areas of philosophy
- a successful thesis defense.

Four to six hours of the 30 credit hours must be thesis hours; the remaining 24 to 26 hours are for course work credit hours (roughly eight courses). At least 18 hours must be philosophy courses (PHIL 6940 and PHIL 6950 do not count).

No more than 9 hours of credit may be transferred into the program from other graduate programs. Students who enter the MA program already holding an MA degree may not transfer into the program any credits that applied toward the MA degree already held.

Students must demonstrate competence in the core areas of philosophy by passing, with a grade of B or better, one graduate or upper-division course in each of the following three areas: history of philosophy, metaphysics and epistemology, and ethics and social or political philosophy.

Required Courses and Credit Hours

Required Courses

PHIL 6950	Master's Thesis	4-6
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Electives

One course on the history of philosophy. Course topic must cover a philosopher or subject in ancient (5th century BC through Augustine) or early modern philosophy (17th to 18th century; roughly Descartes to Kant).	3
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PHIL 5010	Single Philosopher	
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	
One course in metaphysics and epistemology:	3	
PHIL 5300	Philosophy of Mind	
PHIL 5340	Epistemology	
PHIL 5360	Metaphysics	
PHIL 5400	Philosophy of Science	
PHIL 5490	Philosophy of Language	
PHIL 5550	Metaphysics and Epistemology Proseminar	

PHIL 6300	Seminar in Philosophy of Mind	
PHIL 6340	Seminar in Epistemology	
PHIL 6380	Seminar in Metaphysics	
PHIL 6400	Seminar in Philosophy of Science	
One course in ethics and social or political philosophy:	3	
PHIL 5100	Ethics	
Other course as approved by the graduate director.		
Other electives to fulfill the 30-credit minimum:	14-12	
PHIL 5810	Special Topics in Philosophy (no more than 9 hours may be counted toward the 30-hour requirement)	
PHIL 5840	Graduate Independent Study (no more than 6 hours may be counted toward the 30-hour requirement)	
Demonstrate proficiency in propositional and first-order logic by taking the following course, taking all the examinations of this course and earning the appropriate grade, or by earning the appropriate grade on a comprehensive final exam to be offered in that course each semester:	3	
PHIL 2440	Symbolic Logic	
Total Credit Hours	30	

Thesis and Oral Defense

Each student must prepare a thesis plan acceptable to the chair of his or her thesis committee and proceed to write the thesis, working as closely as necessary with the chair. At the appropriate time, the committee will convene to hold a final oral defense of the thesis. A copy of the thesis must be furnished to each committee member at least two weeks prior to the scheduled date of the defense.

Plan II: Non-Thesis Option

The department will award a non-thesis MA to any student who has completed 36 credits of graduate-level course work with a B+ average or better. Twenty-four hours of course work must be in philosophy.

The student must also meet the standard logic requirement and take six credits in each of our three general areas: history of philosophy, metaphysics and epistemology, and ethics and social or political philosophy.

Standard restrictions on the number of credits earned from special topics and from independent study apply.

Required Courses and Credit Hours

Electives

Two courses on the history of philosophy. Course topic must cover a philosopher or subject in ancient (5th century BC through Augustine) or early modern philosophy (17th to 18th century; roughly Descartes to Kant).	6
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PHIL 5010	Single Philosopher	
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	
Two courses in metaphysics and epistemology:	6	
PHIL 5300	Philosophy of Mind	
PHIL 5340	Epistemology	
PHIL 5360	Metaphysics	
PHIL 5400	Philosophy of Science	
PHIL 5490	Philosophy of Language	
PHIL 5550	Metaphysics and Epistemology Proseminar	

PHIL 6300	Seminar in Philosophy of Mind	
PHIL 6340	Seminar in Epistemology	
PHIL 6380	Seminar in Metaphysics	
PHIL 6400	Seminar in Philosophy of Science	
Two courses in ethics and social or political philosophy:		6
PHIL 5100	Ethics	
Other course as approved by the graduate director.		
Other electives to fulfill the 36-credit minimum:		15
PHIL 5810	Special Topics in Philosophy (no more than 9 hours may be counted toward the 30-hour requirement)	
PHIL 5840	Graduate Independent Study (no more than 6 hours may be counted toward the 30-hour requirement)	
Demonstrate proficiency in propositional and first-order logic by taking the following course, taking all the examinations of this course and earning the appropriate grade, or by earning the appropriate grade on a comprehensive final exam to be offered in that course each semester:		3
PHIL 2440	Symbolic Logic	
Total Credit Hours		36

Philosophy - Doctor of Philosophy (PhD)

The philosophy PhD program at CU Boulder consists of approximately 2.5 years of course work and 2.5 years of dissertation work, with 5 years of guaranteed funding. We are both a research and a teaching department; teaching appointments are not only the principal means of supporting graduate students, but are also the way we train graduate students for a career of teaching as well as doing research in philosophy.

Applicants for admission to the Graduate School for work toward a doctoral degree with a major in philosophy are expected to have had 18 or more credit hours in undergraduate courses in the subject.

Students in the doctoral programs must satisfy a variety of requirements, including the completion of course work. The department has a diversified faculty that can supervise the writing of doctoral dissertations on a wide range of topics. The department makes available a limited number of teaching assistantships and assists with job placement.

Students wishing to pursue graduate work in philosophy should note Graduate School requirements in the Doctoral Degree Requirements (p. 867) section and obtain a copy of the *Graduate Program Rules* from the department.

Requirements

The PhD requires 45 hours of approved graduate study, in addition to the 30 hours of dissertation credit hours required by the Graduate School. Twenty-seven of the 45 hours (equivalent to 9 courses) must satisfy departmental distribution requirements. Other requirements include a logic requirement, satisfactory completion of the third-semester diagnostic paper and fifth-semester qualifying paper, and successful prospectus oral and dissertation defense.

No more than 21 hours of credit may be transferred into the program from graduate programs outside CU Boulder, or taken through the ACCESS program at CU Boulder. Credits that applied toward another PhD may not

be transferred into this program. All credit transfers must be approved by the DGS. All philosophy courses taken at the 5000 level or above, if taken for the master's degree at CU Boulder, may be applied toward the doctoral degree if they otherwise satisfy the requirements of the PhD program.

No more than 9 hours of credit toward the graduation requirement may be taken in courses outside the department. These courses must be at the graduate level. They should be relevant to the student's main area of interest and approved by the student's advisor and/or the grad advisor.

Students must earn an average of A- (minimum 3.66 on a 4-point scale) over any 9 hours in each of the following three areas: history of philosophy, metaphysics and epistemology, and value theory. Graduate Independent Study (PHIL 5840) may not count toward the distribution requirements.

Required Courses and Semester Credit Hours

Required Courses

PHIL 8990	Doctoral Dissertation	30
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Electives

Choose one course in classical philosophy. The topic must cover an ancient philosopher or subject in the period ranging from 5th century BC through Augustine.

PHIL 5010	Single Philosopher	
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	

Choose one course in modern philosophy. The topic must cover a philosopher or subject in the history of early modern philosophy (17th to 18th century).

PHIL 5010	Single Philosopher	3
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	

Choose one open course. The topic must cover a philosopher or subject in the period ranging from classical Greece through 1950 (including the history of early analytic philosophy and the history of early 20th-century continental philosophy).

PHIL 5010	Single Philosopher	3
PHIL 5020	Topics in the History of Philosophy	
PHIL 6000	Seminar in the History of Philosophy	

Three courses in metaphysics and epistemology:

PHIL 5300	Philosophy of Mind	9
PHIL 5340	Epistemology	
PHIL 5360	Metaphysics	

PHIL 5400	Philosophy of Science	
PHIL 5490	Philosophy of Language	
PHIL 5550	Metaphysics and Epistemology Proseminar	

PHIL 6300	Seminar in Philosophy of Mind	
PHIL 6340	Seminar in Epistemology	
PHIL 6380	Seminar in Metaphysics	

PHIL 6400	Seminar in Philosophy of Science	
PHIL 6490	Seminar in Philosophy of Language	

Three courses in value theory:

PHIL 5100	Ethics	9
PHIL 5110	Contemporary Moral Theory	
PHIL 5200	Contemporary Political Philosophy	
PHIL 5210	Philosophy and Social Policy	

PHIL 5230	Bioethics and Public Policy
PHIL 5240	Seminar in Environmental Philosophy
PHIL 5260	Philosophy of Law
PHIL 5290	Topics in Values and Social Policy
PHIL 6100	Seminar in Ethics
PHIL 6200	Seminar in Social and Political Philosophy

Total Credit Hours

57

Diagnostic Paper

During the first week of the third semester of study in the PhD program, each student who did not enter the program with two years of prior graduate work or with an MA degree in philosophy from elsewhere will submit a diagnostic paper in a core area of philosophy. It may be an expanded version of a paper written for a first-year class, and should be 4,500 to 7,000 words in length.

In the case of students who are entering the program with two years of prior graduate work or with an MA degree in philosophy from elsewhere, a 4,500- to 7,000-word diagnostic paper must be submitted during the student's first semester in the PhD program. This can be a paper produced for a course at CU Boulder.

In either case, a committee composed of three members specializing in the appropriate area and appointed by the graduate director will evaluate the work and alert students to any problems or difficulties.

Students entering our PhD program with an MA in philosophy from CU Boulder are exempt from this requirement.

Prospectus and Oral Examination

After passing the qualifying paper, students must assemble a prospectus committee of five members of the department, with a clearly designated chair. Students must submit a written prospectus to this committee, which, after judging the prospectus acceptable, will conduct an oral exam concerning this prospectus and related topics.

Dissertation and Oral Defense

Students must write a dissertation that is acceptable to the dissertation committee and defend the dissertation in a public, oral defense at a time deemed appropriate by the committee.

Recommended Plan of Study

Ideally, PhD students in their first two years will take and complete three courses per semester, for a total of 12 courses (36 credit hours) by the end of the second year. The minimum number of courses PhD students can take to make good progress in the first two years of the program is five courses per year.

At the beginning of the third semester in the program, students turn in a diagnostic paper, with feedback from three faculty members.

At the beginning of the fifth semester in the program, students turn in the fifth-semester qualifying paper, which will be evaluated anonymously; this is a qualifying event that the student must pass in order to be considered for advancement to candidacy in the PhD program.

In the fifth semester, students continue to take courses in order to complete the required 45 hours of course work (15 courses). Ideally, students should have completed course work by the end of their fifth semester and should begin work on the prospectus.

Students should defend their work in a prospectus oral exam sometime in their sixth semester. Students are eligible to sign up for up to 10 dissertation hours before they pass their prospectus exam.

The remainder of the required 30 dissertation hours are used in the fourth and fifth years in the program while completing the dissertation.

Physics

Graduate study and opportunities for basic research are offered in the areas of nuclear physics, theoretical physics, condensed matter physics, elementary particle physics, plasma physics, atomic and molecular physics, optical science and engineering, laser physics, fundamental measurements, liquid crystal science and technology, biophysics, and physics education research.

Doctoral programs in chemical physics and geophysics are offered jointly with the Department of Chemistry and with the other departments that participate in the interdepartmental geophysics program.

Course code for this program is PHYS.

Master's Degree

- Physics - Master of Science (MS) (p. 1060)

Doctoral Degree

- Physics - Doctor of Philosophy (PhD) (p. 1061)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Dana Z (https://experts.colorado.edu/display/fisid_102371)
Professor; PhD, University of Arizona

Ashby, Neil
Professor Emeritus

Baker, Daniel N (https://experts.colorado.edu/display/fisid_103264)
Distinguished Professor; PhD, University of Iowa

Bartlett, David
Professor Emeritus

Beale, Paul D (https://experts.colorado.edu/display/fisid_101602)
Professor; PhD, Cornell University

Becker, Andreas (https://experts.colorado.edu/display/fisid_146675)
Associate Professor; Dr habil, Universite Laval (Canada)

Betterton, Meredith D (https://experts.colorado.edu/display/fisid_125396)
Associate Professor; PhD, Harvard University

Bolton, Daniel Ryan (https://experts.colorado.edu/display/fisid_155168)
Instructor; PhD, University of Washington

Calkins, Michael Andrew (https://experts.colorado.edu/display/fisid_149720)
Assistant Professor; PhD, University of California-Los Angeles

Cary, John R (https://experts.colorado.edu/display/fisid_105901)
Professor; PhD, University of California-Berkeley

Chasteen, Stephanie Viola (https://experts.colorado.edu/display/fisid_145183)
Lecturer

Clark, Noel A (https://experts.colorado.edu/display/fisid_101947)
Professor; PhD, Massachusetts Institute of Technology

Cooper, John
Professor Emeritus

Cumalat, John P (https://experts.colorado.edu/display/fisid_105582)
Professor; PhD, University of California-Santa Barbara

Cundiff, Steven (https://experts.colorado.edu/display/fisid_112280)
Lecturer

De Alwis, Senarath P (https://experts.colorado.edu/display/fisid_103029)
Professor; PhD, University of Cambridge (England)

Degradand, Thomas A (https://experts.colorado.edu/display/fisid_102740)
Professor; PhD, Massachusetts Institute of Technology

Dessau, Daniel S (https://experts.colorado.edu/display/fisid_107532)
Professor; PhD, Stanford University

DeWolfe, Oliver M (https://experts.colorado.edu/display/fisid_142992)
Associate Professor; PhD, Massachusetts Institute of Technology

Dincao, Jose Paulo (https://experts.colorado.edu/display/fisid_143731)
Asst Research Professor; PhD, Univ of Sao Paulo (Brazil)

Dreitlein, Joseph
Professor Emeritus

Dubson, Michael A (https://experts.colorado.edu/display/fisid_102266)
Senior Instructor; PhD, Cornell University

Faller, James E (https://experts.colorado.edu/display/fisid_102047)
Professor Adjunct

Finkelstein, Noah D (https://experts.colorado.edu/display/fisid_129919)
Professor; PhD, Princeton University

Ford, William T.
Professor Emeritus

Franklin, Allan D.
Professor Emeritus

Glaser, Matthew A (https://experts.colorado.edu/display/fisid_105271)
Professor Attendant Rank

Glenn, Jason (https://experts.colorado.edu/display/fisid_115556)
Professor; PhD, University of Arizona

Goldman, Martin V (https://experts.colorado.edu/display/fisid_100567)
Professor; PhD, Harvard University

Gopinath, Juliet T (https://experts.colorado.edu/display/fisid_147075)
Assistant Professor; PhD, Massachusetts Institute of Technology

Gurarie, Victor Vladimir (https://experts.colorado.edu/display/fisid_129918)
Professor; PhD, Princeton University

Halverson, Nils W (https://experts.colorado.edu/display/fisid_134252)
Associate Professor; PhD, California Institute of Technology

Hamilton, Andrew J S (https://experts.colorado.edu/display/fisid_101517)
Professor; PhD, University of Virginia

Hasenfratz, Anna (https://experts.colorado.edu/display/fisid_102393)
Professor; PhD, Lorand Eotvos University, Budapest (Hungary)

Hermann, Allen M.
Professor Emeritus

Hermele, Michael Aaron (https://experts.colorado.edu/display/fisid_143370)
Associate Professor; PhD, University of California-Santa Barbara

Holland, Murray John (https://experts.colorado.edu/display/fisid_105126)
Professor; PhD, Oxford Univ (England)

Horanyi, Mihaly (https://experts.colorado.edu/display/fisid_102420)
Professor; PhD, Lorand Eotvos University, Budapest (Hungary)

Hough, Loren Evan (https://experts.colorado.edu/display/fisid_144904)
Assistant Professor; PhD, University of Colorado Boulder

Jaron-Becker, Agnieszka Anna (https://experts.colorado.edu/display/fisid_146689)
Assoc Research Professor; PhD, Univ of Warsaw (Poland)

Kapteyn, Henry C (https://experts.colorado.edu/display/fisid_115334)
Professor; PhD, University of California-Berkeley

Kempf, Sascha (https://experts.colorado.edu/display/fisid_149628)
Assistant Professor; Dr habil, Tech Univ of Braunschweig (Germany)

Kinney, Edward R (https://experts.colorado.edu/display/fisid_101717)
Professor; PhD, Massachusetts Institute of Technology

Kunz, P. Dale
Professor Emeritus

Lee, Minhyea (https://experts.colorado.edu/display/fisid_145209)
Assistant Professor; PhD, University of Chicago

Lewandowski, Heather Jean (https://experts.colorado.edu/display/fisid_111815)
Associate Professor; PhD, University of Colorado Boulder

MacLennan, Joseph E (https://experts.colorado.edu/display/fisid_104854)
Professor Attendant Rank

Mahanthappa, K. T.
Professor Emeritus; PhD, Harvard University

Marino, Alysia Diane (https://experts.colorado.edu/display/fisid_146427)
Associate Professor; PhD, University of California-Berkeley

Miller, Stanley
Professor Emeritus

Munsat, Tobin Leo (https://experts.colorado.edu/display/fisid_134251)
Associate Professor; PhD, Princeton University

Murnane, Margaret (https://experts.colorado.edu/display/fisid_115333)
Distinguished Professor; PhD, University of California-Berkeley

Nagle, James L (https://experts.colorado.edu/display/fisid_126784)
Professor; PhD, Yale University

Nandkishore, Rahul Mahajan (https://experts.colorado.edu/display/fisid_156417)
Assistant Professor; PhD, Massachusetts Institute of Technology

Nauenberg, Uriel
Professor Emeritus

Neil, Ethan (https://experts.colorado.edu/display/fisid_153411)
Assistant Professor; PhD, Yale University

Nesbitt, David (https://experts.colorado.edu/display/fisid_100333)
Professor Adjunct

O'sullivan, William J.
Professor Emeritus

Parker, Scott E (https://experts.colorado.edu/display/fisid_109685)
Professor; PhD, University of California-Berkeley

Perkins, Katherine K. (https://experts.colorado.edu/display/fisid_124217)
Assoc Professor Attendant Rank

Peterson, R. Jerome
Professor Emeritus; PhD, University of Washington

Phillipson, Paul E.
Professor Emeritus

Pollock, Steven J (https://experts.colorado.edu/display/fisid_101392)
Professor; PhD, Stanford University

Price, John C (https://experts.colorado.edu/display/fisid_101129)
Professor; PhD, Stanford University

Radzihovsky, Leo (https://experts.colorado.edu/display/fisid_107484)
Professor; PhD, Harvard University

Rankin, Patricia (https://experts.colorado.edu/display/fisid_105939)
Professor; PhD, University of London (England)

Raschke, Markus B (https://experts.colorado.edu/display/fisid_148716)
Professor; PhD, Tech Univ of Munich (Germany)

Regal, Cindy Anne (https://experts.colorado.edu/display/fisid_144184)
Associate Professor; PhD, University of Colorado Boulder

Reznik, Dmitry (https://experts.colorado.edu/display/fisid_147659)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Ristinen, Robert
Professor Emeritus

Ritzwoller, Michael H (https://experts.colorado.edu/display/fisid_102264)
Professor; PhD, University of California-San Diego

Robertson, Scott H.
Professor Emeritus

Rogers, Charles (https://experts.colorado.edu/display/fisid_101331)
Professor; PhD, Cornell University

Romatschke, Paul (https://experts.colorado.edu/display/fisid_149870)
Assistant Professor; PhD, Technical Univ of Vienna (Austria)

Schibli, Thomas Richard (https://experts.colorado.edu/display/fisid_143464)
Associate Professor; PhD, Univ of Karlsruhe (Germany)

Shaheen, Sean Eric (https://experts.colorado.edu/display/fisid_153664)
Associate Professor; PhD, University of Arizona

Shepard, James R.
Professor Emeritus

Smalyukh, Ivan I (https://experts.colorado.edu/display/fisid_144757)
Associate Professor; PhD, Kent State University

Smythe, Rodman
Professor Emeritus

Stenson, Kevin M (https://experts.colorado.edu/display/fisid_128676)
Associate Professor; PhD, University of Wisconsin-Madison

Taylor, John
Professor Emeritus

Uzdensky, Dmitri Anatoljevich (https://experts.colorado.edu/display/fisid_147430)
Associate Professor; PhD, Princeton University

Wagner, Stephen R (https://experts.colorado.edu/display/fisid_139773)
Professor Attendant RankLecturer

Wahr, John M.
Professor Emeritus

Wyss, Walter
Professor Emeritus

Yin, Xiaobo (https://experts.colorado.edu/display/fisid_153484)
Assistant Professor; PhD, Stanford University

Zhong, Shijie (https://experts.colorado.edu/display/fisid_118396)
Professor; PhD, University of Michigan Ann Arbor

Zimmerman, Eric (https://experts.colorado.edu/display/fisid_122809)
Professor; PhD, University of Chicago

Courses

PHYS 5030 (3) Intermediate Mathematical Physics 1

This course and its continuation, PHYS 5040, form a survey of classical mathematical physics. Studies complex variable theory and finite vector spaces, and includes topics in ordinary and partial differential equations, boundary value problems, potential theory, and Fourier analysis.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5030

Requisites: Restricted to graduate students only.

PHYS 5040 (3) Intermediate Mathematical Physics 2

Continuation of PHYS 5030. Includes group theory, special functions, integral transforms, integral equations and calculus of variations.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5040

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 5030.

PHYS 5130 (3) Biological Electron Microscopy: Principles and Recent Advances

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stm, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4130

PHYS 5141 (3) Astrophysical and Space Plasmas

Covers magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5140

Requisites: Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

PHYS 5150 (3) Introductory Plasma Physics

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory). Department enforced prerequisite: PHYS 3310. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5150

Requisites: Restricted to graduate students only.

PHYS 5160 (3) Fundamentals of Optics and Lasers

Covers the basic physics of lasers. Topics include basics of optical resonators and gaussian beam propagation, stimulated emission, laser threshold conditions, laser linewidth, q-switching and mode locking of lasers, tuning of Cw lasers, and specifics of various common lasers.

Requisites: Restricted to graduate students only.

PHYS 5210 (3) Theoretical Mechanics

Variational principles, Lagrange's equations, Hamilton's equations, motion of rigid body, relativistic mechanics, transformation theory, continuum mechanics, small oscillations, Hamilton-Jacobi theory.

Requisites: Restricted to graduate students only.

PHYS 5250 (3) Introduction to Quantum Mechanics 1

Quantum phenomena, Ehrenfest theorem and relation to classical physics, applications to one-dimensional problems, operator techniques, angular momentum and its representations, bound states and hydrogen atom, and Stern-Gerlach experiment and spin and spinor wave function. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

Requisites: Restricted to graduate students only.

PHYS 5260 (3) Introduction to Quantum Mechanics 2

Symmetries and conservation laws, identical particle systems, approximation techniques (including time-dependent and time-independent perturbation theories and variational techniques) and their applications, scattering theory, radiative transitions, and helium atom.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 5250.

PHYS 5430 (3) Advanced Laboratory

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today. Department enforced prerequisites: PHYS 3330 and PHYS 3220 and PHYS 3320. Department enforced corequisites: PHYS 4410.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4430

Requisites: Restricted to graduate students only.

PHYS 5450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4450 and PHIL 4450 and PHIL 5450

Requisites: Restricted to graduate students only.

PHYS 5460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4460 and EDUC 4460 and EDUC 5460

Requisites: Restricted to graduate students only.

PHYS 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4550 and MCDB 4550 and MCDB 5500

PHYS 5560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4560 and MCDB 4560 and MCDB 5560

Grading Basis: Letter Grade

PHYS 5606 (3) Optics Laboratory

Consists of 13 optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers and holograms, and experimentation of fiber optics and Fourier optics.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5606

Recommended: Prerequisite undergraduate optics course such as PHYS 4510.

PHYS 5770 (3) Gravitational Theory (Theory of General Relativity)

Presents Einstein's relativistic theory of gravitation from geometric viewpoint; gives applications to astrophysical problems (gravitational waves, stellar collapse, etc.). Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites PHYS 3220 and PHYS 3320.

PHYS 5840 (1-3) Selected Topics for Graduate Independent Study

Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 5970 (3) Seminar: Physical Methods in Biology

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, EELS, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, CAT), Fourier analysis, synchrotron radiation, EXAFS, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4970

Requisites: Restricted to graduate students only.

PHYS 6260 (3) Geometry of Quantum Fields and Strings

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories.

Equivalent - Duplicate Degree Credit Not Granted: MATH 6260

Recommended: Prerequisites MATH 6230 and PHYS 5250 and MATH 6240 and PHYS 7280.

PHYS 6610 (3) Earth and Planetary Physics 1

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6610 and ASTR 6610

Requisites: Restricted to graduate students only.

PHYS 6620 (3) Earth and Planetary Physics 2

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6620 and ASTR 6620

Requisites: Restricted to graduate students only.

PHYS 6630 (3) Earth and Planetary Physics 3

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6630 and ASTR 6630

Requisites: Restricted to graduate students only.

PHYS 6650 (1-3) Seminar in Geophysics

Advanced seminar studies in geophysical subjects for graduate students.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6650 and GEOL 6650

Requisites: Restricted to graduate students only.

PHYS 6670 (2) Geophysical Inverse Theory

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6670

Requisites: Restricted to graduate students only.

Recommended: Prerequisites a course in calculus and a course in computer programming (any language).

PHYS 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

PHYS 6950 (1-6) Master's Thesis

Approved problem in theoretical or experimental physics under the direction of staff members. Intended to introduce the student to procedures in research and development work. Work of an original nature expected.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHYS 7160 (3) Intermediate Plasma Physics

Continuation of PHYS 5150. Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 7160

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 5150.

PHYS 7230 (3) Statistical Mechanics

Classical and quantum statistical theory, including study of both equilibrium and nonequilibrium systems. Topics covered include kinetic theory, degenerate gases, macrocanonical and grand canonical ensembles, and irreversible processes. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

Requisites: Restricted to graduate students only.

PHYS 7240 (3) Advanced Statistical Mechanics

Introduces current research topics in statistical mechanics. Topics vary from year to year and may include phase transitions, critical phenomena, nonequilibrium phenomena, dense fluids, dynamical systems, plasma physics, or quantum statistical mechanics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 7230.

PHYS 7250 (3) Quantum Many Body Theory

Theory of quantum many body systems, including methods based on Green's functions, Feynman diagrams, and coherent state path integral with applications to interacting quantum gases, superconductivity and superfluidity, quantum phase transitions, quantum magnetism, quantum motion in the presence of disorder, and topological states of matter.

Requisites: Restricted to graduate students only.

PHYS 7270 (3) Introduction to Quantum Mechanics 3

Radiation theory; relativistic wave equations with simple applications; introduction to field theory and second quantization.

Requisites: Restricted to graduate students only.

PHYS 7280 (3) Advanced Quantum Theory

Quantum theory of fields, elementary particles, symmetry laws, and topics of special interest.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 7270 or instructor consent required.

PHYS 7310 (3) Electromagnetic Theory 1

Sophisticated approach to electrostatics, boundary value problems, magnetostatics, applications of Maxwell's equations to electromagnetic wave propagation, wave guides, and resonant cavities and magnetohydrodynamics.

Requisites: Restricted to graduate students only.

PHYS 7320 (3) Electromagnetic Theory 2

Continuation of PHYS 7310. Topics include relativistic particle dynamics; radiation by moving charges; multiple fields; radiation damping and self-fields of a particle; collisions between charged particles and energy loss; radiative processes; and classical field theory.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 7310.

PHYS 7430 (3) Soften Condensed Matter Physics

Introduces the science of liquid crystals, polymers, biological membranes, biopolymers, block copolymers, molecular monolayers, colloids, nanoparticle suspensions, emulsions, foams, gels, elastomers and other soft materials. Topics vary from semester to semester and is geared toward graduate students with diverse preparation backgrounds, including students from the Department of Physics, as well as other science and engineering departments.

Requisites: Restricted to graduate students only.

PHYS 7440 (3) Theory of the Solid State

Stresses application to the solid state of physical concepts basic to much of modern physics, single-particle approximation, and the energy-band description of electron states in solids, pseudopotential theory applied to ordered and disordered systems, dynamical behavior of electrons in solids, lattice dynamics, Hartree-Fock and random-phase approximation in solids, many-body aspects of magnetism, and superconductivity.

Requisites: Restricted to graduate students only.

PHYS 7450 (3) Theory of Solid State 2

Second semester of condensed matter physics, covers topics in soft condensed matter physics, liquid crystals, semiconductors, Quantum Hall effect, Fractional Quantum Hall effect, superconductivity and other topics at the discretion of the instructor.

Requisites: Restricted to graduate students only.

PHYS 7550 (3) Atomic and Molecular Spectra

Covers theory of atomic structure and spectra, including coupling of angular momenta, tensor operators, energy levels, fine and hyperfine structure, transition probabilities, Zeeman and Stark effects. Molecular spectra: electronic, vibrational, and rotational states. Rotation matrices, symmetric top.

Requisites: Restricted to graduate students only.

PHYS 7560 (3) Quantum Optics

Covers quantum optical and atomic systems including topics such as: coherent and squeezed states, theory of optical coherence, atom-radiation interaction, optical Bloch equations, open quantum systems, dynamics on the Bloch sphere, resonance fluorescence, beam-splitters and interferometry, entanglement and quantum information.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites PHYS 3220 and PHYS 4410.

PHYS 7650 (3) Nonlinear and Nano-Optics

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include: description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their integration, measurement and manipulation and their use in applications including spectroscopy.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites PHYS 4510 or PHYS 5160.

Grading Basis: Letter Grade

PHYS 7660 (3) Ultrafast Optics

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their generation, measurement and manipulation and their use in applications including spectroscopy. Department enforced prerequisite: PHYS 5160, or PHYS 4510, or ECEN 5645.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

PHYS 7730 (3) Theory of Elementary Particles

Systematics of elementary particles, leptons, quarks, gauge bosons, symmetries and symmetry breaking, scattering cross sections, decay rates, electron-positron annihilation, lepton scattering and hadron structure, quantum chromodynamics, electroweak interactions, gauge theories.

Requisites: Restricted to graduate students only.

PHYS 7810 (1-3) Special Topics in Physics

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHYS 7820 (3) Topics in Scientific Writing

Teaches strategies used in scientific writing with emphasis on problem statement, audience analysis and principles of sound argument; reviews and reinforces essential writing skills, stressing the need for careful and strategic revision; provides experience in writing academic and professional communications; presentation skills and proposal writing. Most appropriate for students beginning to write journal articles, Comps II paper, or dissertation chapter.

Requisites: Restricted to graduate students only.

PHYS 7830 (1-3) Plasma Seminar

One credit 'journal club' style course covering current and significant historical advances in plasma physics research. Each week the class is assigned a journal article to read in advance of the meeting and one student is selected (on a rotating basis) to present a synopsis and lead a round-table discussion. Cannot be used for minimum credit hour requirements of graduate program. See also PHYS 7810 and PHYS 7820. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

PHYS 7840 (1-3) Selected Topics for Graduate Independent Study

Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 7850 (1-3) Selected Topics for Graduate Independent Study

Subject matter to be arranged. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 7915 (1) Seminar Topics in Physics

Various seminar topics not normally covered in the curriculum: offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHYS 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Physics - Master of Science (MS)

Students may obtain a master's degree as either an undergraduate student through the concurrent bachelor's/master's degree program or as a graduate student. Undergraduate students can apply to the concurrent bachelor's/master's degree program any time after completion of the typical first-semester junior physics classes and before graduation.

Graduate students are generally only admitted to the PhD program in physics. Therefore, graduate students who have completed their PhD comprehensive exam or who are unable to complete the PhD program may earn an MA degree en route to a PhD degree. In certain circumstances, students can be admitted to the graduate program for a terminal master's degree, in which case the prerequisites are the same as for the doctoral program.

Concurrent Degree Programs

BA/MS in Physics

The BA/MS program in physics aims to provide new opportunities for undergraduate physics majors. The program is specifically addressed to the students in the Plan 1 major program of the Department of Physics. The Plan 1 physics major gives students a thorough grounding in theoretical physics so that they are well prepared either to proceed with graduate work or with professional employment. For students interested in graduate studies, the BA/MS program in physics allows for participation in graduate course work and research in a broad range of areas. For students interested in immediate professional employment, the BA/MS program would serve as a terminal degree program that qualifies students for a higher level of employment.

For more information, see the Department of Physics Concurrent Bachelor's/Master's Degree (<http://www.colorado.edu/physics/academics/undergraduate-students/concurrent-bachelorsmasters-degree>) website.

BS/MS in Engineering Physics and Physics

The BS/MS program in engineering physics aims to provide new opportunities for undergraduate engineering physics majors. The program is specifically addressed to engineering physics majors in the Department of Physics. The engineering physics major gives students a thorough grounding in theoretical physics, applied mathematics, and broad exposure to engineering topics, so that they are well prepared

either to proceed with graduate work or with professional employment in either basic science or in applied fields. For students interested in graduate studies, the BS/MS program in engineering physics allows for participation in graduate course work and research in a broad range of areas. For students interested in immediate professional employment, the BS/MS program would serve as a terminal degree program that qualifies students for a higher level of employment.

For more information, see the Department of Physics Concurrent Bachelor's/Master's Degree (<http://www.colorado.edu/physics/academics/undergraduate-students/concurrent-bachelorsmasters-degree>) website.

Requirements

Qualifying Examination

The Graduate Record Examination (GRE) aptitude tests and advanced test in physics are normally used in place of a qualifying examination, and this examination is normally taken before the time of entry into the Graduate School.

Course Requirements

There are two separate plans for obtaining the master's degree, both of which require a total of 30 credit hours at the 5000 level or above (up to 6 credit hours may be at the 3000 or 4000 level if approved by the physics graduate chair). All but 3 credit hours must be in physics (more credit hours may be allowed with permission of the physics graduate chair). A minimum of a B average (GPA of 3.0) must be maintained.

Degree Plans

Plan I: Thesis Option

This plan requires 4–6 thesis credit hours and completion of five of the following courses with a grade of B- or better.

Required Courses

Select five of the following courses:	15
PHYS 5430	Advanced Laboratory
PHYS 5250	Introduction to Quantum Mechanics 1
PHYS 5260	Introduction to Quantum Mechanics 2
PHYS 7310	Electromagnetic Theory 1
PHYS 7320	Electromagnetic Theory 2
PHYS 5210	Theoretical Mechanics
PHYS 7230	Statistical Mechanics
Total Credit Hours	15

The student must write a thesis and present a talk to a three-member faculty committee.

Plan II: Non-Thesis Option

This plan requires completion of five of the following courses with a grade of B- or better.

Required Courses

Select five of the following courses:	15
PHYS 5250	Introduction to Quantum Mechanics 1
PHYS 5260	Introduction to Quantum Mechanics 2
PHYS 7310	Electromagnetic Theory 1
PHYS 7320	Electromagnetic Theory 2
PHYS 5210	Theoretical Mechanics

PHYS 7230	Statistical Mechanics
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Total Credit Hours

15

The student must pass the comprehensive exam II, which is a three-section examination that includes a formal research review paper and a formal presentation, followed by a question and answer oral session.

Physics - Doctor of Philosophy (PhD)

Graduate study and opportunities for basic research are offered in the areas of nuclear physics, theoretical physics, condensed matter physics, elementary particle physics, plasma physics, atomic and molecular physics, optical science and engineering, laser physics, fundamental measurements, liquid crystal science and technology, biophysics, and physics education research.

Doctoral programs in chemical physics (p. 939) and geophysics (p. 1002) are offered jointly with the Department of Chemistry and with the other departments that participate in the interdepartmental geophysics program.

Requirements

Prerequisites

Entering graduate students must have a thorough undergraduate preparation in physics, equivalent to an undergraduate physics major at a recognized college or university. This preparation includes courses in general physics, analytical mechanics, electricity and magnetism, thermodynamics, quantum mechanics, atomic physics and mathematics through differential equations and complex variables.

Students wishing to pursue graduate work in physics leading to candidacy for an advanced degree should carefully read the Doctoral Degree Requirements (p. 867) section of this catalog.

Qualifying Examination

The Graduate Record Examination aptitude tests and advanced test in physics are normally used in place of a qualifying examination, and this examination is normally taken before the time of entry into the Graduate School.

Course Requirements

To earn a PhD, candidates must complete 30 credit hours of graduate courses and 30 hours of dissertation credit. At least 27 of the 30 credit hours of course work must be physics courses at the 5000 level or above; exceptions may be granted with the discretion of the associate chair of graduate studies. All courses, required or otherwise, must be passed with a grade of B- or better, and a course may be repeated only once.

Comprehensive Examination

The comprehensive examination is divided into three parts. Part I consists of passing any five of the following six courses with a B- or better:

PHYS 5210	Theoretical Mechanics	3
PHYS 7230	Statistical Mechanics	3
PHYS 5250 & PHYS 5260	Introduction to Quantum Mechanics 1 and Introduction to Quantum Mechanics 2	6
PHYS 7310 & PHYS 7320	Electromagnetic Theory 1 and Electromagnetic Theory 2	6

The associate chair may waive courses for students with graduate-level equivalents. Part II is a three-section examination that includes a formal research review paper and a formal presentation, followed by a question-and-answer oral session. Part III consists of a thesis prospectus presented to the thesis committee.

Part II of the comprehensive examination must be taken after successful completion of Part I, but no later than the student's sixth enrolled regular semester. Part III will generally take place the semester following Part II. Parts II and III of the comprehensive examination may be taken a second time, no more than one semester after the first attempt.

Language Requirement

The department has no requirement in foreign languages.

Political Science

The Department of Political Science offers instruction and research in the art and science of politics. Work within the department is organized around six basic fields: American government and politics, comparative politics, international relations, public policy, political theory and empirical theory and methodology. The department's mission is to understand the political world and to equip students and their community with the skills for a lifetime of inquiry and engagement.

Course code for this program is PSCI.

Doctoral Degree

- Political Science - Doctor of Philosophy (PhD) (p. 1068)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Edward Scott (https://experts.colorado.edu/display/fisid_108903)
Professor; PhD, Columbia University In the City of New York

Andersson, Krister Par (https://experts.colorado.edu/display/fisid_140076)
Professor; PhD, Indiana University Bloomington

Aydin, Aysegul (https://experts.colorado.edu/display/fisid_143789)
Associate Professor; PhD, SUNY at Binghamton

Baird, Vanessa Anne (https://experts.colorado.edu/display/fisid_115297)
Associate Professor; PhD, University of Houston-University Park

Baker, Andrew B. (https://experts.colorado.edu/display/fisid_144377)
Associate Professor; PhD, University of Wisconsin-Madison

Bayard de Volo, Lorraine M. (https://experts.colorado.edu/display/fisid_143611)
Associate Professor; PhD, University of Michigan Ann Arbor

Bearce, David H. (https://experts.colorado.edu/display/fisid_147837)
Professor; PhD, Ohio State University

Beer, Francis A.
Professor Emeritus

Bickers, Kenneth Norman (https://experts.colorado.edu/display/fisid_130482)
Professor; PhD, University of Wisconsin-Madison

Boulding, Carew Elizabeth (https://experts.colorado.edu/display/fisid_144417)
Associate Professor; PhD, University of California-San Diego

Brown, David S (https://experts.colorado.edu/display/fisid_110166)
Professor; PhD, University of California-Los Angeles

Brown, Hank
Professor Emeritus

Brunner, Ronald D.
Professor Emeritus

Chan, Steve S (https://experts.colorado.edu/display/fisid_102816)
Professor; PhD, University of Minnesota Twin Cities

Chen, Ming Hsu (https://experts.colorado.edu/display/fisid_149591)
Associate Professor; PhD, University of California-Berkeley

Clarke, Susan E.
Professor Emeritus

Costain, Anne N.
Professor Emeritus

Deutmeyer, Megan Shannon (https://experts.colorado.edu/display/fisid_154265)
Associate Professor; PhD, University of Iowa

Donavan, Janet Lynn (https://experts.colorado.edu/display/fisid_145270)
Senior Instructor; PhD, University of Wisconsin-Madison

Eckart, Dennis R.
Professor Emeritus

Ferguson, Michaele L. (https://experts.colorado.edu/display/fisid_129299)
Associate Professor; PhD, Harvard University

Fitch, J. Samuel
Professor Emeritus

Fitzgerald, Jennifer L (https://experts.colorado.edu/display/fisid_140086)
Associate Professor; PhD, Brown University

Greenberg, Edward S.
Professor Emeritus

Griffin, John David (https://experts.colorado.edu/display/fisid_151708)
Associate Professor; PhD, Duke University

Jupille, Joseph H (https://experts.colorado.edu/display/fisid_140088)
Associate Professor; PhD, University of Washington

Kanner, Michael David (https://experts.colorado.edu/display/fisid_100925)
Lecturer

Mapel, David Reed (https://experts.colorado.edu/display/fisid_104552)
Associate Professor; PhD, Johns Hopkins University

Mclver, John P.
Professor Emeritus

Mewes, Horst (https://experts.colorado.edu/display/fisid_102085)
Associate Professor; PhD, University of Chicago

Parinandi, Srinivas C (https://experts.colorado.edu/display/fisid_155589)
Assistant Professor; PhD, University of Michigan Ann Arbor

Safran, William
Professor Emeritus

Scarritt, James R.
Professor Emeritus

Shin, Adrian (https://experts.colorado.edu/display/fisid_158138)
Assistant Professor; PhD, University of Michigan Ann Arbor

Sloan, Royal Daniel Jr
Professor Emeritus

Sokhey, Anand Edward (https://experts.colorado.edu/display/fisid_147113)
Associate Professor; PhD, Ohio State University

Sokhey, Sarah Wilson (https://experts.colorado.edu/display/fisid_147614)
Assistant Professor; PhD, Ohio State University

Steinmo, Sven H (https://experts.colorado.edu/display/fisid_105905)
Professor; PhD, University of California-Berkeley

Strayhorn, Joshua Aaron (https://experts.colorado.edu/display/fisid_152584)
Assistant Professor; PhD, Emory University

Tir, Jaroslav (https://experts.colorado.edu/display/fisid_149842)
Professor; PhD, University of Illinois at Urbana-Champaign

Vanderheiden, Steven Jon (https://experts.colorado.edu/display/fisid_144759)
Associate Professor; PhD, University of Wisconsin-Madison

Wolak, Jennifer Lynn (https://experts.colorado.edu/display/fisid_133263)
Associate Professor; PhD, University of North Carolina Chapel Hill

Young, Gregory D (https://experts.colorado.edu/display/fisid_143374)
Instructor

Courses

PSCI 6948 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSCI 7002 (3) Seminar in West European Politics

Examines West European politics in terms of general theories of comparative politics, including institutional, behavioral and political economy approaches.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7004 (3) Seminar: Political Theory

Allows for intensive research in and presentation of selected topics. Introduces students to the broad context within which political ideas arise. Deals with classical and modern thought.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Political Theory

PSCI 7008 (1) Teaching Political Science

Designed to prepare graduate student teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline-specific education.

Requisites: Restricted to Political Science (PSCI) graduate students only.

Additional Information: Departmental Category: General

PSCI 7011 (3) Seminar: American Politics

Core field seminar for students of American politics. Course work emphasizes the diversity of contemporary research on American political history, political institutions, and political behavior.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7012 (3) Seminar: Comparative Political Systems

Discusses current literature on comparative politics including theoretical and methodological issues.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7013 (3) Seminar: International Relations

Reviews salient literature on international relations, and subsequent presentation and critical discussion of analytical studies. Allows students wide latitude in substantive and methodological approaches. Emphasizes changing trends and efforts to understand the bases for cooperation and conflict.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7021 (3) Latinos and U.S. Politics

Examines in depth the theoretical and empirical literature assessing the political situation and activities of Latinos (Mexican Americans, Puerto Ricans, Cuban Americans, and others) in the U.S. Stresses original research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7022 (3) Seminar in Political and Economic Development

Covers domestic political and economic development in Latin America, Africa, and Asia, as well as interactions with the global economy. Includes defining, explaining, and prescribing policies for successful development, and comparing the experiences of developing and industrialized countries.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7023 (1) Foreign Policy

Examines sources of foreign policy in terms of international pressures, economic interests, bureaucratic politics, cognitive process, public opinion, elections, congress, and presidential leadership. Examines uses and limitations of economic statecraft, military intervention, and current foreign policy issues.

Recommended: Prerequisite PSCI 7013.

Additional Information: Departmental Category: International Relations

PSCI 7024 (3) Seminar: Selected Political Theories

Familiarizes students with selected political philosophies or theories in classical or modern political thought.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Political Theory

PSCI 7028 (1) Teaching Political Science 2

Second course designed to train graduate teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline specific education.

Requisites: Requires prerequisite course of PSCI 7008 (minimum grade D-). Restricted to Political Science (PSCI) graduate students only.

Additional Information: Departmental Category: General

PSCI 7031 (3) Seminar: Political Attitudes and Behavior

Provides an intensive examination of topics in political attitudes and behavior such as political participation, ideology, voting, and elite behavior. Reviews methodology of behavioral research and introduces ICPSR data archive and computer-based research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7032 (3) Seminar: Latin American Politics

Stresses intensive study of the political process in Latin America with special emphasis on democratization.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7043 (3) Seminar: Problems of International Organization

Studies selected problems concerning administration and operation of public international organizations, including the United Nations and its specialized agencies. Considers decision making, executive leadership, internal organization, personnel policies, coordination of activities, and financing.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7046 (3) Seminar: Urban Public Policy

Focuses on formulation, revision, and outcomes of public policy in American urban communities. Also uses some comparative Canadian and European literature.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Policy

PSCI 7051 (3) Seminar: The United States Congress

Comprehensively examines literature and selected research topics concerning the United States Congress.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7052 (3) Democracy & Authoritarianism

Examine differences between democracies and authoritarian regimes; the choices and the consequences of democratic institutions in authoritarian regimes; and the causes of authoritarian survival and demise and the subsequent political choice.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PSCI 7012.

Additional Information: Departmental Category: Comparative

PSCI 7053 (3) War and Peace

Explores the conditions that promote conflict between countries, focusing on broad and systemic explanations of war and peace. Investigates classical as well as current behavioral approaches to understanding why countries fight.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7055 (3) Introductory Game Theory

Develops competence in engaging formal theories of politics and in constructing and solving basic game-theoretic models of political behavior.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7056 (3) Readings in Public Policy

Explores diverse approaches to policy choice, change, and learning processes. Overviews literature on policy determinants and typologies, policy subsystems, innovation and diffusion, agenda setting, implementation, problem definition and social construction, policy design, institutional analysis, and policy and democratic values.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Policy

PSCI 7062 (3) The Politics of Ethnicity

Explores the political aspects of pluralism, ethnonationalism, separatism, and related phenomena. Examines theories of ethnic mobilization, conflict, and accommodation in the context of political development and nation building. Includes cross-polity comparisons and case studies of multiethnic societies in the developed and developing world.

Requisites: Restricted to graduate students only.

Recommended: Requisite at least one course in comparative politics.

Additional Information: Departmental Category: Comparative

PSCI 7071 (3) Seminar: An Introduction to the Rule of Law

Introduces students to debates about the role of institutions, particularly but not exclusively legal institutions, in placing limits on the state and fostering the rule of law. What is law? Why do courts exist and what is their role in the state? What institutions are necessary to establish the rule of law? Why are institutions successful in some contexts and not others? Considers these questions by surveying classic and current research from American and comparative politics literatures on topics such as judicial independence, credible commitments, separation of powers and constitutional design.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7073 (3) Seminar: Global Political Economy

Introduces graduate students to concepts, theories, and data used to study the global system from a political-economic framework. Examines world systems analysis, regime change theory, and dependency theory with respect to operation of the exchange and power relationship within the contemporary world system.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7075 (3) Scope and Methods of Political Science

Introduces students to research design, with a subsequent focus on professional development. Students learn about different styles of research, central methodological points surrounding (and differentiating) these styles, and standards for evaluating research, regardless of approach or content.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7085 (4) Introduction to Political Science Data Analysis

Provides intensive experience with quantitative techniques commonly employed in political science research, covering basic inferential and descriptive statistics through multiple regression. Students undertake substantive research projects, requiring lab instruction in the use of the computer in quantitative applications of political science research.

Requisites: Restricted to Political Science (PSCI) graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7091 (3) Politics of Social Movements

Examines theoretical and empirical research on American social movements. Emphasizes the role of movements as political actors and their ability to bring about changes in public policy and national political institutions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7095 (3) Advanced Political Data Analysis

Provides advanced training in the statistical modeling of political relationships. Focuses on the properties and assumptions of the ordinary least squares regression model, building on material covered in PSCI 7085: Introduction to Political Science Data Analysis.

Requisites: Requires prerequisite course of PSCI 7085 (minimum grade B-). Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7108 (3) Special Topics

Various topics not normally offered in the curriculum. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSCI 7111 (3) Seminar: American Political Institutions

Intensive examination of the structure and rules of different political institutions in the United States. Explores both the changing approaches to the study of American political institutions as well as many of the major research topics on the presidency, Congress, the judiciary, and the bureaucracy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7112 (3) Seminar: Comparative Political Parties and Interest Groups

Critically examines topics relating to social forces, parties, and interest groups. Analyzes concepts, theories, and case studies with particular emphasis on Western political systems. Also examines party systems in comparison and the role of groups and the determinants of group politics.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7114 (3) Survey of Historical and Contemporary Political Theory

Examines major texts of Western political thought from the ancients through the 21st century. Introduces students to major schools of contemporary political theory, while situating these in their larger political context. Professionalizes students through presentations and research projects. Texts vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Requisite some previous coursework in political theory or philosophy.

Additional Information: Departmental Category: Political Theory

PSCI 7115 (3) Qualitative Methods

Develop proficiency in constructing research designs with qualitative methods. The goal is to understand and be able to justify research designs involving relatively small numbers of observations as good political science given the fact that such designs may limit our ability to generalize.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7116 (3) Context-Sensitive Research Methods

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5740

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Policy

PSCI 7123 (3) Seminar: Conflict Behavior - The Politics of Violence

Surveys historical, theoretical, and empirical analyses of violent conflict behavior, including causes and consequences of riots, terrorism, revolution, international war, and intervention.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7124 (3) Contemporary Democratic Theory

Surveys major schools of contemporary democratic theory and introduces students to current scholarly debates about democracy and democratic politics. Professionalizes students through class presentations and research projects. Specific controversies and texts vary each semester.

Requisites: Restricted to graduate students only.

Recommended: Requisite some previous coursework in political theory or philosophy.

Additional Information: Departmental Category: Political Theory

PSCI 7126 (3) Introduction to Public Policy

Designed for graduate students specializing in the field of public policy in the political science program. Surveys a wide variety of approaches to the analysis and understanding of public policy. The course is not a survey of any particular set of substantive policy areas but instead is intended as an examination of the enduring puzzles that analysts of public policy commonly confront, the kinds of research methodologies that they employ, and a selection of the techniques that they bring to bear on their research questions.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 7132 (3) Comparative Political Economy

Explores the relationship between economics and politics in developed and developing countries. Gives students an historical overview of 20th century economic trends and covers scholarly approaches to topics such as political and economic institutions, economic ideas and interests, the political causes of growth and equality, globalization and the welfare state, and varieties of capitalism.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PSCI 7012.

Additional Information: Departmental Category: Comparative

PSCI 7145 (3) Advanced Game Theory

Covers more advanced applications of game theory in political science. Equips students with the skills to design and solve models at a reasonably high level of complexity and generality, and to understand how to effectively make use of such models in their research.

Requisites: Requires prerequisite course of PSCI 7055 (minimum grade B-). Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7151 (3) American Subnational Politics and Government

Provides a comprehensive overview of the issues and literature concerning American "Subnational" politics. Considers three bodies of literature: American federalism and intergovernmental relations, state politics, and urban/local politics. Also examines a number of policy issues.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7155 (3) Maximum Likelihood Estimation and Generalized Linear Models

Introduces maximum likelihood estimation and extends the linear model to several "generalized linear models." Provides students with the skills to analyze and understand a broad class of outcome variables and data structures such as dichotomous outcomes, counts, ordered and unordered categorical outcomes and bounded variables. Also examines several special topics such as multilevel models, causal inference and missing data.

Requisites: Requires prerequisite courses of PSCI 7075 and PSCI 7085 and PSCI 7095 (all minimum grade B-). Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7171 (3) Seminar: Law and Democratic Governance

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 8205

Recommended: Prerequisite PSCI 7011.

Additional Information: Departmental Category: American

PSCI 7173 (3) The Politics of International Factor Flows

Focuses on the second dimension of international trade: the politics of international factor flows. Economic globalization can be defined as the freer flow of (1) goods and services (i.e., international trade) and (2) factors of production (e.g., capital and labor) across national borders. Links these topics in International Political Economy to broader theories of International Relations, namely Institutionalism and Liberalism.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Relations

PSCI 7175 (3) Dissertation Seminar

Help students make progress towards (1) in the short term: focusing in on a dissertation topic, crafting a dissertation prospectus, and identifying potential funding sources; and (2) in the long term: sending papers out for review, developing a package for the job market, and understanding the academic job market and the tenure process.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7181 (3) Immigration Law and Immigrants' Rights

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7615

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7183 (3) International Cooperation

Investigates the origins, forms and consequences of international cooperation. The course covers both theoretical material related to international cooperation and various related global issue areas; security, economy, environment and social welfare. For each issue area, the key theoretical debates, empirical findings, as well as central challenges and parameters that constrain international cooperation will be investigated.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Relations

PSCI 7185 (3) Political Network Analysis

Explores all aspects of political network analysis including disciplinary background, theories and concepts, approaches and applications, data basics and measurement, and techniques of analysis. Data assignments use software such as UCINET and R. Introduces visualization software including NetDraw, NetworkX and Cytoscape.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7191 (3) Law and Politics Colloquium: Race in America

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 8645

Grading Basis: Letter Grade

Additional Information: Departmental Category: American

PSCI 7206 (3) Public Policy and the Governance of Natural Resources

Addresses a basic empirical puzzle in comparative environmental policy: why are some governmental organizations able to create relatively functional governance arrangements for natural resources management, while many others fail to do so? More specifically, we will seek to understand the particular contextual conditions that make successful governance transformations more likely.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 7302 (3) Political Economy of International Migration and Policy

Provides an overview of the seminal and cutting edge research on the political economy of international migration including both immigration and emigration. Covers a diverse set of international migration issues, including public attitudes toward immigration, special interest politics of immigration policy making and the dynamics between political institutions and international migration.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7901 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: American

PSCI 7902 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7903 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: International Relations

PSCI 7904 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Political Theory

PSCI 7905 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7906 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Public Policy

PSCI 7908 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSCI 8901 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 8902 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Comparative

PSCI 8903 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: International Relations

PSCI 8904 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Political Theory

PSCI 8905 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 8906 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Public Policy

PSCI 8908 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSCI 8991 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: American

PSCI 8992 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Comparative

PSCI 8993 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: International Relations

PSCI 8994 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Political Theory

PSCI 8995 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 8996 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Public Policy

Political Science - Doctor of Philosophy (PhD)

The Department of Political Science at CU Boulder offers instruction and research in the art and science of politics. The department has a long tradition of excellence in training graduate students. A diverse faculty of nearly 30 professors trains graduate students to conduct original research in six areas of political science:

- American government and politics
- comparative politics
- international relations
- political theory
- public policy
- empirical theory and methodology

Admission is highly competitive, with approximately 10–12 new students enrolled each fall. This ensures a high faculty-to-student ratio and close mentoring opportunities. In addition, the department holds an outstanding placement record.

The department does not accept applications for a terminal MA in political science. Students in the PhD program earn an MA in political science after the completion of a successful qualifying paper and defense at the end of the second year in the program.

Requirements

The Department of Political Science PhD program includes course work in six fields of study, a qualifying research paper and oral defense, comprehensive written and oral examinations, doctoral prospectus defense, final dissertation defense, and minimum 30 dissertation credit hours.

While students take a wide range of courses, they must demonstrate mastery of two different fields: the major (first field) and the minor (second field). Students must complete a minimum of three seminars

in each field. Also, students are required to take at least three courses outside of their major and minor fields.

Students must complete a minimum of 42 credit hours of course work with a B average or better. Of these 42 credit hours, 39 must be at the 7000 level or higher and 35 credit hours must be taken in the Political Science Department. Students must also take a minimum of 30 dissertation credit hours.

Students must take additional course work with the consideration that they will fulfill all requirements needed to complete the program. During a student's first semester in residence they are required to take three introductory courses: PSCI 7008 Teaching Political Science, PSCI 7075 Scope and Methods of Political Science and PSCI 7085 Introduction to Political Science Data Analysis.

As a condition of funding, all students appointed as graduate assistants are required to enroll in a minimum of 9 credit hours per semester for their first five semesters or until they have passed comprehensive exams.

Students wishing to pursue graduate work toward the degree should carefully read the Doctoral Degree Requirements (p. 867) section and review the courses listed in this catalog. Requirements for the political science graduate program are clarified in more detail on the department's PhD Requirements and Handbook (<http://www.colorado.edu/polisci/graduate/phd>) webpage. (<http://www.colorado.edu/polisci/graduate>)

Time Limit

Full-time students are expected to complete all requirements for the PhD degree within five years of entering the program; the maximum time allowed by the Graduate School is six years.

Psychology and Neuroscience

The Department of Psychology and Neuroscience at CU Boulder offers PhD degrees in five programs:

- behavioral genetics
- behavioral neuroscience (including learning and motivation)
- clinical psychology
- cognitive psychology
- social psychology

Although we do not offer a graduate degree in developmental psychology, a substantial number of our faculty have related research interests. The department also participates in a number of interdisciplinary degree and certificate programs.

Students contemplating postgraduate education, either in professional or in graduate school, are encouraged to participate in the departmental honors program, which provides special opportunities for individualized attention.

CU Boulder's Department of Psychology and Neuroscience has been ranked by the National Academy of Sciences as one of the best in the country with respect to the quality of the faculty and their scholarly productivity. Moreover, the department offers undergraduates a wide range of opportunities for involvement in research.

Course codes for this program are PSYC and NRSC.

Doctoral Degrees

- Neuroscience - Doctor of Philosophy (PhD) (p. 1076)

- Psychology - Doctor of Philosophy (PhD) (p. 1077)

Certificate

- Neuroscience - Graduate Certificate (p. 1078)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Allen, David Lehigh (https://experts.colorado.edu/display/fisid_114466)
Senior Instructor; PhD, University of California-Los Angeles

Alpern, Herbert P.
Professor Emeritus

Arch, Joanna Jennifer (https://experts.colorado.edu/display/fisid_147415)
Assistant Professor; PhD, University of California-Los Angeles

Bachtell, Ryan Karn (https://experts.colorado.edu/display/fisid_146084)
Associate Professor; PhD, Oregon Health Science University

Banich, Marie (https://experts.colorado.edu/display/fisid_120646)
Professor; PhD, University of Chicago

Barrientos-Wood, Ruth M (https://experts.colorado.edu/display/fisid_117816)
Asst Research Professor; PhD, George Washington University

Barth, Daniel (https://experts.colorado.edu/display/fisid_100820)
Professor; PhD, University of California-Los Angeles

Bernard, Jessica (https://experts.colorado.edu/display/fisid_153711)
Asst Professor Adjunct

Berta, Joseph E (https://experts.colorado.edu/display/fisid_101962)
Senior Instructor; PhD, University of Colorado Boulder

Bidwell Kovalev, Lorna Cinnamon (https://experts.colorado.edu/display/fisid_155117)
Asst Research Professor; PhD, University of Colorado Boulder

Blair, Irene Verna (https://experts.colorado.edu/display/fisid_107261)
Professor; PhD, Yale University

Blechman, Elaine A.
Professor Emeritus

Bloom, Bernard L.
Professor Emeritus

Bourne, Lyle E. Jr
Professor Emeritus

Bryan, Angela (https://experts.colorado.edu/display/fisid_115216)
Professor; PhD, Arizona State University

Campeau, Serge (https://experts.colorado.edu/display/fisid_115395)
Professor; PhD, Yale University

Carey, Gregory (https://experts.colorado.edu/display/fisid_101322)
Associate Professor; PhD, University of Minnesota Twin Cities

Carter Carston, Ronald McKell (https://experts.colorado.edu/display/fisid_154921)
Assistant Professor; PhD, California Institute of Technology

Cartwright, Desmond S.
Professor Emeritus

Collins, Allan C.
Professor Emeritus

Colunga, Eliana (https://experts.colorado.edu/display/fisid_129477)
Associate Professor; PhD, Indiana University Bloomington

Correll, Joshua Raphael (https://experts.colorado.edu/display/fisid_151728)
Associate Professor; PhD, University of Colorado Boulder

Curran, Timothy (https://experts.colorado.edu/display/fisid_118454)
Professor; PhD, University of Oregon

Day, Heidi E W (https://experts.colorado.edu/display/fisid_116632)
Senior Instructor; PhD, University of Cambridge (England)

DeFries, John C.
Professor Emeritus

Dimidjian, Sona Armine (https://experts.colorado.edu/display/fisid_140084)
Associate Professor; PhD, University of Washington

Forward, John R.
Professor Emeritus

Friedman, Naomi P (https://experts.colorado.edu/display/fisid_109519)
Assistant Professor; PhD, University of Colorado Boulder

Gruber, June L (https://experts.colorado.edu/display/fisid_153634)
Assistant Professor; PhD, University of California-Berkeley

Harvey, Lewis Orvis (https://experts.colorado.edu/display/fisid_101173)
Professor; PhD, Pennsylvania State University

Healy, Alice F (https://experts.colorado.edu/display/fisid_100418)
Professor; PhD, Rockefeller University

Hernandez, Theresa D (https://experts.colorado.edu/display/fisid_102953)
Professor; PhD, University of Texas at Austin

Hewitt, John K (https://experts.colorado.edu/display/fisid_101035)
Professor; PhD, University of London (England)

Hutchison, Kent Edward (https://experts.colorado.edu/display/fisid_113101)
Professor; PhD, Oklahoma State University

Ito, Tiffany Anne (https://experts.colorado.edu/display/fisid_113066)
Professor; PhD, University of Southern California

Jessor, Richard
Professor Emeritus

Jones, Matthew Carl (https://experts.colorado.edu/display/fisid_144611)
Associate Professor; PhD, University of Michigan Ann Arbor

- Judd, Charles M (https://experts.colorado.edu/display/fisid_101853)
Professor; PhD, Columbia University In the City of New York
- Kaufmann, Vyga G. (https://experts.colorado.edu/display/fisid_151089)
Instructor
- Keller, Matthew C (https://experts.colorado.edu/display/fisid_144507)
Associate Professor; PhD, University of Michigan Ann Arbor
- Kim, Albert E. (https://experts.colorado.edu/display/fisid_143740)
Associate Professor; PhD, University of Pennsylvania
- King, D Brett (https://experts.colorado.edu/display/fisid_103815)
Senior Instructor; PhD, Colorado State University
- Kintsch, Walter
Professor Emeritus
- LeBourgeois, Monique Katherine (https://experts.colorado.edu/display/fisid_148411)
Assistant Professor; PhD, University of Southern Mississippi
- Loersch, Christopher Alan (https://experts.colorado.edu/display/fisid_149841)
Assistant Professor; PhD, Ohio State University
- Maier, Steven F (https://experts.colorado.edu/display/fisid_100482)
Distinguished Professor; PhD, University of Pennsylvania
- McClelland, Gary H.
Professor Emeritus
- McGraw, Albert Peter (https://experts.colorado.edu/display/fisid_133262)
Associate Professor; PhD, Ohio State University
- Michl, Josef (https://experts.colorado.edu/display/fisid_102977)
Professor Attendant Rank; PhD, Czech Academy of Sciences, Prague (Czech Republic)
- Miklowitz, David J (https://experts.colorado.edu/display/fisid_105771)
Professor Adjunct; PhD, University of California-Los Angeles
- Mittal, Vijay (https://experts.colorado.edu/display/fisid_148386)
Asst Professor Adjunct; PhD, Emory University
- Miyake, Akira (https://experts.colorado.edu/display/fisid_107321)
Professor; PhD, Carnegie Mellon University
- Munakata, Yuko (https://experts.colorado.edu/display/fisid_125036)
Professor; PhD, Carnegie Mellon University
- O'Reilly, Randall Charles (https://experts.colorado.edu/display/fisid_110512)
Professor; PhD, Carnegie Mellon University
- Olson, Richard Kellogg (https://experts.colorado.edu/display/fisid_103121)
Professor; PhD, University of Oregon
- Park, Bernadette (https://experts.colorado.edu/display/fisid_103732)
Professor; PhD, Northwestern University
- Pittman-Wagers, Justina (https://experts.colorado.edu/display/fisid_117148)
Senior Instructor; PsyD, University of Denver
- Polson, Peter G.
Professor Emeritus
- Ramirez, Albert
Professor Emeritus
- Rhee, Soo H (https://experts.colorado.edu/display/fisid_123401)
Associate Professor; PhD, Emory University
- Richardson, Emily (https://experts.colorado.edu/display/fisid_115007)
Asst Research Professor; PhD, University of Iowa
- Rudy, Jerry W (https://experts.colorado.edu/display/fisid_101550)
Professor; PhD, University of Virginia
- Saddoris, Michael Paul (https://experts.colorado.edu/display/fisid_152979)
Assistant Professor; PhD, Johns Hopkins University
- Sasnett-Martichuski, Diane Kay (https://experts.colorado.edu/display/fisid_111599)
Senior Instructor; PhD, Colorado State University
- Sharpless, Seth K.
Professor Emeritus
- Spencer, Robert L (https://experts.colorado.edu/display/fisid_104362)
Professor; PhD, University of Arizona
- Stallings, Michael C (https://experts.colorado.edu/display/fisid_108745)
Professor; PhD, University of Southern California
- Taylor, Ronald G.
Professor Emeritus
- Thomas, David R.
Professor Emeritus
- Urland, Geoffrey Raymond (https://experts.colorado.edu/display/fisid_151086)
Lecturer
- Van Boven, Leaf D (https://experts.colorado.edu/display/fisid_126291)
Professor; PhD, Cornell University
- Vigers, Alison Jane (https://experts.colorado.edu/display/fisid_142378)
Instructor
- Vrieze, Scott Ian (https://experts.colorado.edu/display/fisid_153059)
Assistant Professor; PhD, University of Minnesota Central office
- Wager, Tor Dessart (https://experts.colorado.edu/display/fisid_147666)
Professor; PhD, University of Michigan Ann Arbor
- Watkins, Linda R (https://experts.colorado.edu/display/fisid_101513)
Distinguished Professor; PhD, Virginia Commonwealth University
- Weatherley, Donald A.
Professor Emeritus
- Wehner, Jeanne M.
Professor Emeritus
- Wertheimer, Michael
Professor Emeritus

Whisman, Mark (https://experts.colorado.edu/display/fisid_113391)
Professor; PhD, University of Washington

Willcutt, Erik G (https://experts.colorado.edu/display/fisid_113861)
Professor; PhD, University of Denver

Wilson, James R.
Professor Emeritus

Courses

NRSC 5015 (3) Affective Neuroscience

Experiencing and learning from affect–emotional value—is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4015

Requisites: Restricted to graduate students only.

NRSC 5032 (3) Neurobiology of Learning and Memory

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4032

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4052 and PSYC 4052 and PSYC 5052

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4072

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5082 (3) Neural Circuits of Learning and Decision Making

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4082

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

NRSC 5092 (4) Behavioral Neuroendocrinology

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function. In addition to attending and meeting all the requirements for the lecture portion of the course, graduate students meet for an additional hour each week to discuss in depth behavioral neuroendocrinology relevant research articles.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4092

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5100 (2-5) Introduction to Neuroscience I

Provides an intensive introduction to the principles of neuroscience, initially covering the detailed neuroanatomy of human forebrain, hindbrain, and spinal cord. This is followed by neurophysiology with a concentration on the electrophysiology of neural systems. The basics of neuroanatomy and neurophysiology with a concentration on the electrophysiology are then applied to an examination of the structure and function of visual, auditory, and sensorimotor systems in animal and man.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Requisite, restricted to Interdepartmental Neuroscience Program or instructor consent required.

NRSC 5110 (3) Introduction to Neuroscience II

Provides an intensive interdisciplinary introduction to the principles of neuroscience. It is a sequel to NRSC 5100. Provides a detailed overview of neurochemistry, neurodevelopment, neuromotor control, neurogenetics, and cognitive neuroscience. Open to undergraduates with instructor permission.

Requisites: Requires a prerequisite course of NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

NRSC 5132 (3) Neuropharmacology

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4132

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5262 (3) Mammalian Neuroanatomy

Provides a detailed overview of peripheral and central nervous system connective neuroanatomy targeted at delineating functional sensory, motor and motivational systems and the control of behavior and cognition. Emphasizes histological, anatomical and functional techniques employed in investigations of the nervous system. Formerly PSYC 5262.

Requisites: Requires a prerequisite course of NRSC 2100 or NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 5545 (3) Neurobiology of Addiction

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction.

Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4545

Requisites: Restricted to graduate students only.

NRSC 5911 (3) Teaching of Neuroscience

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4911

Requisites: Restricted to graduate students only.

NRSC 6100 (2) Advances in Neuroscience Seminar

Designed for beginning graduate students interested in neuroscience. Students read, discuss, and evaluate the primary literature on a number of current topics in neuroscience as well as attend the seminar program in neuroscience.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

NRSC 6602 (1) Behavioral Neuroscience Professional Skills Development

Enrolled graduate students in the behavioral neuroscience program will be asked to prepare, present and receive feedback on scientific presentations of their own research or from review of a current research project.

Repeatable: Repeatable for up to 14.00 total credit hours.

Grading Basis: Letter Grade

NRSC 7102 (2-3) Topics in Neuroscience

Advanced seminar dealing with different specialized topics in neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7112 (3) Special Topics in Neuroscience I

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7122 (3) Special Topics in Neuroscience II

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7132 (3) Special Topics in Neuroscience III

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7142 (3) Special Topics in Neuroscience IV

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7152 (3) Special Topics in Neuroscience V

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

PSYC 5052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4052 and NRSC 4052 and NRSC 5052

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 5082 (2-3) Seminar: Biological Psychology

Special topics concerning biological bases of behavior. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of PSYC 4052 (minimum grade D-).

Additional Information: Departmental Category: Biological

PSYC 5102 (3) Intro to Behavioral Genetics

Provides introduction to basic principles of genetics in the study of behavior, methods used to examine the influences of genes and environment on behavior, and interpretation of studies using these methods. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 5112 (3) Concepts in Behavioral Genetics

Examines selected topics in greater detail than is possible in the comprehensive undergraduate course in behavioral genetics (PSYC 3102). Topics covered may include inheritance of behavioral characteristics from perspectives of pharmacogenetics, transmission genetics, biochemical genetics, and evolutionary genetics. Instructor consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Biological

PSYC 5122 (3) Quantitative Genetics

Surveys principles of genetics of quantitative characteristics. Topics include gene frequencies, effects of mutation, migration, and selection. Also looks at correlations among relatives, heritability, inbreeding, crossbreeding, and selective breeding.

Additional Information: Departmental Category: Biological

PSYC 5131 (3) Affective Science

Core graduate course on affective science and fulfills APA Cognitive and Affective Aspects of Behavior Requirement. Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of emotions; cognitive and behavioral aspects of emotion; neurobiological mechanisms; development of emotion; and psychopathology and emotion.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: General

PSYC 5145 (4) Advanced Cognitive Psychology

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4145

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 5175 (4) Computational Cognitive Neuroscience

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4175

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 5200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4200 and IPHY 5200

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: General

PSYC 5232 (2) Molecular Genetics and Physiology

Covers fundamental mechanisms of gene action, including genome structure and regulation of gene expression. Discusses molecular techniques used to examine human genetic diseases. Emphasizes genetic diseases with behavioral, neurologic, and physiologic abnormalities.

Requisites: Requires a prerequisite course of PSYC 5200 or IPHY 5200 (minimum grade D-).

Additional Information: Departmental Category: Biological

PSYC 5242 (3) Biometrical Methods in Behavioral Genetics

Studies development of structural models appropriate to behavioral genetics and the estimation procedures necessary for their application. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 5423 (3) Research Problems in Clinical Psychology

Provides an overview of fundamental research methods relevant to clinical psychology, including literature synthesis, hypothesis formulation and study design, measure selection, and data analysis. Students will gain specific experience writing scientific papers and funding proposals. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 5433 (3) Adult Psychopathology

Intensively surveys major theories, research findings, and behavioral characteristics associated with deviant reaction patterns. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 5453 (3) Developmental Psychopathology

Examines the development of psychopathology across the lifespan, including etiological influences, neurobiological correlates, symptom presentation, and clinical diagnosis and intervention. Instructor consent required.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 5541 (1-6) Special Topics in Psychology

Studies and analyzes special interest topics from the broad and diversified field of psychology. Particular section content is determined by instructor.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4541

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 5606 (3) Proseminar: Social-Personality Psychology

Provides a thorough introduction to methods and theories in social psychology concerned with topics such as the self, social cognition, judgment and decision making, attitude formation and change, small group processes, inter-group relations, health and social psychology, and others. Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Social

PSYC 5656 (3) Advanced Graduate Research Methods

Provides training in the philosophical roots of empirical research, inference of causality, internal and external validity and reliability. These topics will be covered as they relate to a range of research designs including passive observational, experimental, quasi-experimental, meta-analytic and longitudinal. Additional topics include statistical inference and research ethics.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Social

PSYC 5665 (2) Perception and Attention Proseminar

Required proseminar for students in the Cognitive Psychology Ph.D. program. Provides an introduction to current thinking about sensory and perceptual processing, object recognition and attention. Students will read peer-reviewed journal articles and make class presentations on appropriate topics, including methods of data collection and analysis. Graduate students in all programs are welcome and advanced undergraduates are welcome with instructor consent.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Experimental

PSYC 5685 (2) Research Methods Proseminar

Main topic is research methods in cognitive psychology, with an emphasis on experimental methods. Skills and knowledge will be gained that are necessary to A) critically evaluate existing research and B) design, conduct, analyze and write up experimental studies. Required for graduate students in Cognitive Psychology; graduate students in all programs and advanced undergraduates welcome with instructor consent.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Experimental

PSYC 5695 (2) Memory Proseminar

Provides beginning Ph.D. students with a basic introduction to (primarily human) memory research. One of the six required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of experimental, theoretical, behavioral and cognitive neuroscience perspectives on memory. Graduate students in all programs are welcome and advanced undergraduates are welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 5741 (4) General Statistics

Surveys probability and statistics in psychology. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 5751 (4) General Statistics

Continuation of PSYC 5741. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 5761 (3) Structural Equation Modeling

Provides training in the use of structural equation modeling, a class of analytic techniques that include the estimation of unobserved, or latent, constructs and an estimation of relationships among latent constructs.

Recommended: Prerequisite successful completion of graduate level statistics.

Additional Information: Departmental Category: General

PSYC 5815 (2) Language Proseminar

Introduction to research on human language. A required proseminar for Cognitive Psychology Ph.D. students. Covers research at the cognitive, neural, and computational levels. Addresses phenomena at the levels of phonology, grammar, and meaning. Emphasizes interrelationships between language and other domains of cognition (perception, memory, executive function). Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Experimental

PSYC 5825 (2) Executive Function Proseminar

Provides beginning Ph.D. students with an introduction to the study of executive functions. Required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of working memory, inhibition, multi-tasking, monitoring, selection, lifespan changes and social/clinical applications at the cognitive, neural and computational levels. Graduate students in all programs are welcome and advanced undergraduates are welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 5835 (2) Thinking Proseminar

Provides beginning Ph.D. students with a basic introduction to research on complex human cognition, including reasoning, problem solving, decision making, analogy, concept learning and knowledge representation. Includes consideration of theoretical, behavioral and cognitive neuroscience perspectives. One of six proseminar modules required of students in the Cognitive Psychology Ph.D. program. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 6200 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and SLHS 6402

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 6603 (1) Professional Issues in Clinical Psychology

Covers a range of topics important for professional development in clinical psychology, including preparation and delivery of research presentations, preparation of grant proposals/manuscripts and practicum experience (i.e., interviewing and assessment, treatment planning, intervention and documentation). Intended to prepare students for careers as research scientists and clinicians. Instructor consent required.

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 6605 (1) Cognitive Psychology Research Update

Provides summaries of current research by graduate students and faculty members in the Cognitive Psychology program in the Department of Psychology and Neuroscience. Professional Development issues relevant to cognitive psychologists will also be discussed. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Psychology (PSYC) and Neuroscience (NRSC) PhD Students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Experimental

PSYC 6606 (1) Professional Issues in Social Psychology

Covers a range of topics important for professional development in social psychology, including preparation and delivery of research presentations, preparation of grant proposals and manuscripts, and peer review of manuscripts. Intended to prepare students for careers as research scientists.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Social

PSYC 6761 (3) Topics in Advanced Structural Equations Modeling

Covers topics in advanced structural equation modeling, including modeling with nonlinear observed variables, latent variable interactions, longitudinal models, mixture models and transition analysis. Other topics will be covered by request.

Recommended: Prerequisite PSYC 5761.

Additional Information: Departmental Category: General

PSYC 6831 (2) Interdisciplinary Social Science Professional Socialization

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science.

Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 6851

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSYC 6841 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 6911 (1-3) Research Practicum

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: General

PSYC 6941 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSYC 6951 (1-6) Master's Thesis

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSYC 7012 (1-3) Research in Behavioral Genetics

Individual research projects.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 7102 (2) Seminar: Behavioral Genetics

Intensive study of selected topics in behavioral genetics. Emphasizes recent research. Attention to both human and animal studies. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 7215 (3) Seminar: Experimental Psychology

Advanced seminar dealing with different specialized topics, at the discretion of the instructor, in different years. Topics chosen are within the broad range of experimental psychology. Instructor consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 7291 (3) Multivariate Analysis

Familiarizes students with scientific concepts, matrix theory, and computer techniques of multivariate analyses for psychological research. Topics include cluster and factor analysis, multiple regression, and discriminant functions. Emphasizes research technology rather than mathematical theory. Instructor consent required.

Additional Information: Departmental Category: General

PSYC 7315 (2) Advanced Research Seminar on Human Memory

Addresses topics in the experimental psychology of human memory. Specific content varies from semester to semester. Both theoretical issues and contemporary empirical work will be reviewed. Each student will be required to engage in laboratory work outside of class, which will include an original experiment. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 7415 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and SLHS 7418

Requisites: Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

Additional Information: Departmental Category: Experimental

PSYC 7425 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and SLHS 7428

Requisites: Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 7536 (1-3) Personality and Social Psychology

Selected topics in the area of social-personality psychology. Students may register for more than one section of this course within the term and/or within their graduate career. These seminars may be on one of the following topics: stereotyping and prejudice, social neuroscience, person perception, social psychology and the self, health and social psychology, race and ethnic identity, or social cognition.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Social

PSYC 7663 (1) Intellectual Assessment Laboratory

Practice administration of common intellectual and neuropsychological tests.

Requisites: Requires corequisite courses of PSYC 7683. Restricted to graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7673 (3) Adult Psychotherapy

Provides an intensive introduction to the science and practice of psychological treatments for adult psychopathology. Will focus on selected treatments and address the relevant theoretical and empirical base for each approach and the specific principles and procedures utilized. Aim of course is for students to acquire both a scientific and applied knowledge of evidence-based practice in clinical psychology, with a focus on intervention for adult mental disorders. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 7683 (1-3) Intellectual Assessment, with Practicum, in Clinical Psychology

Focuses on administering and interpreting objective test commonly used in clinical psychology practice. Includes case study approach and direct clinical experience. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7693 (3) Personality Measurement

Covers theory and basic applications of psychological assessment, with an emphasis on measurement theory and the assessment of psychopathology and personality. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 7703 (1-3) Seminar: Clinical Psychology

Selected topics in the area of clinical psychology. Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7713 (1-3) Practicum in Clinical Psychology

Provides direct clinical experience for clinical graduate students only. Instructor consent required.

Repeatable: Repeatable for up to 18.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the LCS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science. Restricted to students enrolled in LCS Cognitive Science Academic Programs.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Experimental

PSYC 7793 (1-3) Child Assessment Practicum

Allows students who have already learned adult assessment measures to broaden their knowledge and skills in order to complete psychoeducational evaluations with children. The course covers the background of common childhood disorders, general testing strategies with children, and specific test administration.

Repeatable: Repeatable for up to 3.00 total credit hours.

Recommended: Prerequisite PSYC 7683.

Additional Information: Departmental Category: Developmental

PSYC 8991 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: General

Neuroscience - Doctor of Philosophy (PhD)

The neuroscience community at CU Boulder is made up of over 80 faculty and research associates rostered in 13 departments and institutes. Neuroscience activities on the campus are coordinated by the Center for Neuroscience.

The graduate PhD program in neuroscience is an interdepartmental program currently consisting of eight tracks to a PhD:

- Behavioral Genetics (Integrative Physiology, Psychology & Neuroscience);
- Behavioral Neuroscience (Psychology & Neuroscience);
- Clinical Neuroscience (Psychology & Neuroscience);
- Cognitive Neuroscience (Psychology & Neuroscience);
- Social Neuroscience (Psychology & Neuroscience);
- Integrative Physiological Neuroscience (Integrative Physiology);
- Molecular, Cellular and Developmental Neuroscience (Molecular, Cellular and Developmental Biology); or
- Speech, Language and Hearing Neurosciences (Speech, Language and Hearing Sciences).

Students apply for admission to one of the participating departments, which determines whether to admit the student to CU Boulder and provide financial support. Once in residence, students enter the neuroscience PhD program while still maintaining their "home" in the department to which they were admitted. They receive a PhD that lists both their home department and neuroscience.

The neuroscience curriculum includes a year-long intensive core course, graduate seminar courses linked to an invited speaker series and wide-ranging neuroscience courses offered by many departments and institutes across campus.

Potential applicants are encouraged to visit the Center for Neuroscience (<http://www.colorado.edu/neuroscienceprogram>) website, which provides detailed information on the program, application process, courses, faculty and current trainees.

Triple Degree Program Cognitive Neuroscience Combined PhD

Graduate students in good standing in one of the following participating academic units may apply to earn a combined PhD with cognitive science, neuroscience and their core discipline:

- Psychology and Neuroscience
- Philosophy
- Computer Science
- Linguistics
- Speech, Language and Hearing Sciences
- Education
- Architecture and Planning

Students interested in the combined PhD with cognitive science and neuroscience must meet course and thesis requirements. The student's thesis advisor must be a participating faculty member of the cognitive neuroscience faculty. To enroll in this triple degree, you must enroll in the neuroscience program and the cognitive science program.

For more information, visit the Institute of Cognitive Science's Cognitive Neuroscience Combined PhD (<http://www.colorado.edu/ics/graduate-programs/cognitive-neuroscience-combined-phd>) webpage.

Requirements

All students are admitted with the expectation that they will work toward the PhD degree. Many students receive a Master of Arts degree in the course of working toward the PhD. Students who receive the PhD degree must demonstrate that they are proficient in some broad subject of learning and that they can critically evaluate work in this field; furthermore, they must show the ability to work independently in their chosen field and must make an original contribution of significance to the advancement of knowledge.

In the first year of graduate study, all psychology graduate students enroll in a two-semester graduate statistical sequence. There is a first-year research requirement that starts the student on an active program of research. The student also must enroll in a sequence of courses designed to give exposure to various research topics and methods.

Required Courses and Semester Credit Hours

Required Neuroscience Core Courses

NRSC 5100	Introduction to Neuroscience I ¹	2-5
NRSC 5110	Introduction to Neuroscience II	3
NRSC 6100	Advances in Neuroscience Seminar (three semesters, 2 credits per semester)	6

Required Fundamentals of Neuroscience Depth Courses

Choose a minimum of 3 additional neuroscience-related courses (2-3 6-9 credit hours per course). ²

Neuroscience-Related Discipline Specialization

Choose a sequence of courses that provides an advanced graduate-level specialization in a discipline that contributes to the field of neuroscience. 11

Total Credit Hours 28-34

- ¹ Advanced students take this course for 2 credits; students without advanced preparation take it for 5 credit hours.
- ² For a list of approved neuroscience courses, visit the Neuroscience PhD Program (<http://www.colorado.edu/neuroscienceprogram/phdrequirements.html>) webpage.

Before admission to candidacy for the PhD degree, the student must pass a comprehensive examination in the field of concentration and related fields. This examination tests the student mastery of a broad field of knowledge, not merely the formal course work completed.

A variety of advanced research seminars are taught on a regular basis. Students are required to be enrolled in at least one substantive course in the department each semester until the comprehensive examinations have been successfully completed. Upon completing the comprehensives, students engage in the dissertation research, culminating in a public oral defense.

Potential applicants are encouraged to visit the Center for Neuroscience website, which provides detailed information on the program, application process, courses, faculty and current trainees.

Psychology - Doctor of Philosophy (PhD)

The behavioral genetics program focuses on the study of genetic contributions to individual differences in behavior. The fundamental tenet of the behavioral neuroscience program is that a complete understanding of behavior entails unraveling mechanisms and principles at any and all levels of organization (i.e., behavior, neuroanatomy, neurophysiology, neurochemistry, gene expression and epigenetics).

The major training goals of the clinical psychology program follow the Boulder model in that the preparation of scientist-practitioner is stressed.

Students are admitted for graduate studies leading to the PhD in one of five fields:

- behavioral genetics
- behavioral neuroscience (including learning and motivation)
- clinical psychology
- cognitive psychology
- social psychology

For detailed information about each field of study, visit the department's Graduate Program Areas (<http://www.colorado.edu/psych-neuro/graduate-programs/graduate-program-areas>) webpage.

Note: The department does not offer a terminal master's degree program.

Requirements

All students are admitted with the expectation that they will work toward the PhD degree. Many students receive a Master of Arts degree in the course of working toward the PhD. Students who receive the PhD degree must demonstrate that they are proficient in some broad

subject of learning and that they can critically evaluate work in this field; furthermore, they must show the ability to work independently in their chosen field and must make an original contribution of significance to the advancement of knowledge.

In the first year of graduate study, all psychology graduate students enroll in a two-semester graduate statistical sequence. There is a first-year research requirement that starts the student on an active program of research. The student also must enroll in a sequence of courses designed to give exposure to various research topics and methods.

Before admission to candidacy for the PhD degree, the student must pass a comprehensive examination in the field of concentration and related fields. This examination tests the student mastery of a broad field of knowledge, not merely the formal course work completed.

A variety of advanced research seminars are taught on a regular basis. Students are required to be enrolled in at least one substantive course in the department each semester until the comprehensive examinations have been successfully completed. Upon completing the comprehensives, students engage in the dissertation research, culminating in a public oral defense.

Neuroscience - Graduate Certificate

The graduate certificate in neuroscience and behavior focuses on understanding the nervous system and its relationship to disease and behavior. This understanding encompasses the molecular, cellular and behavioral aspects of neuroscience.

Students come from such graduate programs as ecology and evolutionary biology; behavioral genetics; molecular, cellular and developmental biology; psychology; and integrative physiology. They receive a PhD in their department and a certificate in neuroscience.

Potential applicants are encouraged to visit the center's Graduate Certificate in Neuroscience (<http://www.colorado.edu/neuroscienceprogram/gradcert.html>) webpage, which provides detailed information on the program, application process, courses, faculty and current trainees.

Requirements

The neuroscience core curriculum includes courses in the following areas:

- Neuroscience methods laboratory
- Neuroanatomy
- Neurochemistry or Neuropharmacology
- Neurophysiology or Systems Neuroscience
- Behavioral Neuroscience or Animal Behavior
- Molecular Neuroscience or Molecular Genetics or Developmental Neuroscience

Students are required to attend a weekly journal club or discussion group and neuroscience colloquia.

Religious Studies

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion, through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of

gaining deeper knowledge in one religious tradition, such as Buddhism, Christianity, Daoism, Hinduism, Islam and Native American traditions.

The graduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

Course codes for this program are RLST and SNSK.

Master's Degree

- Religious Studies - Master of Arts (MA) (p. 1080)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ali, Aun H (https://experts.colorado.edu/display/fisid_155948)
Assistant Professor; PhD, McGill Univ (Canada)

Biernacki, Loriljai (https://experts.colorado.edu/display/fisid_115294)
Associate Professor; PhD, University of Pennsylvania

Boyd, Samuel L (https://experts.colorado.edu/display/fisid_155484)
Assistant Professor

Catlos, Brian Aivars (https://experts.colorado.edu/display/fisid_147829)
Professor; PhD, Univ of Toronto (Canada)

Chernus, Ira R (https://experts.colorado.edu/display/fisid_101043)
Professor; PhD, Temple University

Denny, Frederick M.
Professor Emeritus

Gayley, Antonia Hollis (https://experts.colorado.edu/display/fisid_144505)
Assistant Professor; PhD, Harvard University

Gill, Sam D (https://experts.colorado.edu/display/fisid_103595)
Professor; PhD, University of Chicago

Johnson, Gregory B (https://experts.colorado.edu/display/fisid_111214)
Associate Professor; PhD, University of Chicago

Kleeman, Terry F (https://experts.colorado.edu/display/fisid_114181)
Professor; PhD, University of California-Berkeley

Ross-Bryant, Lynn
Professor Emeritus

Sacks, Elias R. (https://experts.colorado.edu/display/fisid_151425)
Assistant Professor; PhD, Princeton University

Shneer, David (https://experts.colorado.edu/display/fisid_146105)
Professor; PhD, University of California-Berkeley

Taylor, Rodney L.
Professor Emeritus

Whitehead, Deborah Faith (https://experts.colorado.edu/display/fisid_144239)
Associate Professor; ThD, Harvard University

Courses

RLST 5030 (3) Religions in America

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4030

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 5045 (3) Ritual Art Dance Drama

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4045

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 5050 (3) Topics in Christian Studies

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4050

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

RLST 5170 (3) God and Politics

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4170 and JWST 4170

Requisites: Restricted to graduate students only.

RLST 5180 (3) Is God Dead?

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4180 and JWST 4180

Requisites: Restricted to graduate students only.

RLST 5200 (3) Topics in Hinduism

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4200

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 5210 (3) Advanced Readings in Sanskrit

Requires at least two years of prior Sanskrit training. Students will read texts in the original. Class time is devoted to parsing out difficult grammatical structures, discussing the philosophical import of the readings and addressing the historical contexts that assist in interpreting the texts. The topic varies according to student interest.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 2120 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Asia Content

RLST 5250 (3) Topics in Buddhism

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4250

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Asia Content

RLST 5260 (3) Topics in Judaism

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4260 and JWST 4260

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

RLST 5280 (3) Body and Magic in India

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4280

Requisites: Restricted to graduate students only.

RLST 5300 (3) Topics in Native American Religions

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4300

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 3 additional credit hours of RLST course work or instructor consent.

RLST 5350 (3) Native American Religions: Regional Studies

Studies religion(s) of a single native North American tribe or geographic region within context of history and culture of the tribe.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 additional credit hours of RLST course work or instructor consent.

RLST 5353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4353 and ETHN 4353 and ETHN 5353

Requisites: Restricted to graduate students only.

RLST 5650 (3) Islam in the Modern World

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4650

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 credit hours of religious studies at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 5750 (3) Daoism

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4750 and CHIN 4750 and CHIN 5750

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 5820 (3) Interdisciplinary Seminar on Religion

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4820

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 5840 (1-6) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 5850 (3) Gender in Hagiography

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4850 and WGST 4850

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 6110 (3) Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 6110

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 6830 (3) Introduction to the Academic Study of Religion

Introduction to the graduate academic study of religion through the exploration of contemporary models and issues that demonstrate the nature and future of the field. Students prepares a profile of intended area of research.

Requisites: Restricted to graduate students only.

RLST 6840 (1-6) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

RLST 6945 (1-4) Directed Readings: Non-Thesis Option

Course work finished or in the last semester.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

RLST 6950 (1-4) Master's Thesis

Requisites: Restricted to graduate students only.

Religious Studies - Master of Arts (MA)

The curriculum in the Department of Religious Studies at CU Boulder trains students in the scholarly understanding and interpretation of the complex phenomenon we call religion through careful study of history, texts, rituals, narrative, art and media. The program offers the skills to approach the comparative study of religion with the option of gaining deeper knowledge in one religious tradition, such as Buddhism, Christianity, Daoism, Hinduism, Islam and Native American traditions.

The graduate degree in religious studies emphasizes the application of various theoretical and methodological approaches to the study of religion; the understanding of religious practices and traditions

with attention to historical context and present-day impact; and the development of media literacy, critical thinking, effective oral and written communication, and research skills in our increasingly globalized and religiously diverse world.

In addition, students with a degree in religious studies are expected to achieve basic religious literacy: the ability to communicate and analyze practical information regarding religious diversity as educated citizens of a pluralistic society and thereby to effectively understand and participate in public debates and discussions about religion.

Dual Degree Program

The Department of Religious Studies also participates in a dual master's degree program with the Departments of History and Asian Languages and Civilizations. Students interested in exploring this option should contact the graduate director of the department for specific requirements.

Requirements

Course Requirements

The student must successfully complete 31 credit hours of academic work, at least 24 of which must be completed at the 5000 level or above. Up to 9 credit hours of course work may be taken outside the department or transferred from another accredited institution, consistent with the student's special needs and interests and with the advisor's approval. Independent study credit hours shall not exceed six credit hours.

A graduate degree represents the mastery of a significant body of knowledge and interpretation within an academic discipline. A degree is not granted merely because a student completes a specific number of courses. The student is expected to acquire both breadth and depth in religious studies.

Breadth is achieved by satisfying two types of course requirements as set forth below, which include exposure to a diversity of approaches to the study of religion. Depth is achieved through three courses in a particular area or approach and by independent work related to the thesis or concentration.

A student who has not completed at least 12 credit hours, or the equivalent, of undergraduate academic course work directly related to the study of religion will be required to do remedial work to make up this deficit before beginning graduate study or, with the director of graduate studies' permission, after beginning the program. This can be done by attaining a grade of B or better in an appropriate 2000- or 3000-level course taken within the first year. Remedial courses may not be counted toward the degree.

Courses for each term must be approved by the student's faculty advisor and be in compliance with the requirements of the Graduate School where necessary. In order to register for any given term, the student must have the course of study for that term approved in writing by the advisor on the student's Record of Progress Toward the MA Degree Form. No changes can be made to registration without the advisor's approval.

Required Courses and Semester Credit Hours

Required Courses

RLST 6830	Introduction to the Academic Study of Religion (This course is offered every fall term and should be taken the first fall term the student is in residence.)
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Electives

Complete three seminars in the academic study of religion. At least one seminar will be designated each semester.	9
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Complete three research concentration courses (to be determined in consultation with one's advisor). These may be taken in or out of the department, as appropriate.	9
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Total Credit Hours	18
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Foreign Language Requirement

In order to receive the degree a student must meet the foreign language requirement. The student must have a satisfactory reading knowledge of a language other than English, demonstrated by a B or better in the fourth semester of the language.

Residency Requirement

All students must fulfill the residency requirement. In general this can be fulfilled by either two full-time semesters or four part-time semesters of study. A full-time program is defined as 5 credit hours of course work at the 5000 level or higher, 8 credit hours of total course work or at least one credit hour of thesis research.

Degree Plans

In the final semester of graduate study, which must be taken in residence, students will select either a thesis or non-thesis research option.

Plan I: Thesis Option

Students selecting the thesis option will take a 4-credit thesis course (RLST 6950), which will culminate in the completion and defense of a thesis.

Plan II: Non-Thesis Option

Students selecting the non-thesis option will take a 4-credit directed readings course on secondary scholarship in a specific field (theoretical topic, geographic area or religious tradition) that will culminate with a written examination on the topic that the student must pass.

Comprehensive Examination

A final oral comprehensive examination, given by the student's research committee, will focus on three substantial term papers and either the thesis or the written examination in a specific field.

Sociology

The graduate program in the Department of Sociology at CU Boulder seeks to train creative and productive scholars and teachers. The department maintains a strong emphasis in the theories and methods of the discipline while specializing in the following areas:

- Criminology
- Cultural Sociology
- Environment, Hazards, and Disasters
- Gender and Sexuality
- Health and Medicine
- Life Course, Aging, and Youth
- Political Economy
- Population
- Race and Ethnicity
- Social Psychology and Emotions

The department offers a PhD program focusing on teaching, researching and training in theory and methods. It, however, does not offer a separate MA program. More information about program specifics can be found in the Graduate Handbook (<http://www.colorado.edu/sociology/students/graduate-students/resources>).

Graduate students will meet with faculty advisors during their time at CU Boulder to foster social integration at the university as well as research interests. Financial support is given to students serving as teaching assistants (TAs). A teaching assistantship is a fulfilling position that allows students to further their understanding of a specific area of study while gaining knowledge in instructing at the university level.

Additionally, advanced graduate students are encouraged to teach their own courses as graduate part-time instructors (GPTIs). The department encourages graduate students to pursue opportunities for funded research wherever possible and supports the efforts of other university units in which students may seek financial support for their research, such as the Institute of Behavioral Science. Aside from teaching and research, CU Boulder offers a wide array of courses for graduate students taught by a diverse and well-regarded faculty.

Course code for this program is SOCY.

Doctoral Degree

- Sociology - Doctor of Philosophy (PhD) (p. 1085)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adler, Patricia A.
Professor Emeritus; PhD, University of California, San Diego

Bailey Mollborn, Stefanie Faun (https://experts.colorado.edu/display/fisid_142921)
Associate Professor; PhD, Stanford University

Bartos, Otomar J.
Professor Emeritus

Belknap, Joanne Elizabeth (https://experts.colorado.edu/display/fisid_113617)
Professor; PhD, Michigan State University

Boardman, Jason D (https://experts.colorado.edu/display/fisid_125577)
Professor; PhD, University of Texas at Austin

Brown, Matthew C (https://experts.colorado.edu/display/fisid_107370)
Instructor; PhD, University of Colorado Boulder

Downey, Liam C (https://experts.colorado.edu/display/fisid_129297)
Associate Professor; PhD, University of Arizona

Downton, James V.
Professor Emeritus

Elliott, Delbert S.
Professor Emeritus

Gimenez, Martha E.
Professor Emeritus

Grant II, Don Sherman (https://experts.colorado.edu/display/fisid_154039)
Professor; PhD, Ohio State University

Harrison, Jill Lindsey (https://experts.colorado.edu/display/fisid_149614)
Associate Professor; PhD, University of California-Santa Cruz

Hubbard, Eleanor
Professor Emeritus

Hunter, Lori Mae (https://experts.colorado.edu/display/fisid_118372)
Professor; PhD, Brown University

Irvine, Leslie Jane (https://experts.colorado.edu/display/fisid_113150)
Professor; PhD, SUNY at Stony Brook

Kjolseth, J. Rolf
Professor Emeritus

Masters, Ryan Kelly (https://experts.colorado.edu/display/fisid_152730)
Assistant Professor; PhD, University of Texas at Austin

Mayer, Thomas
Professor Emeritus

Menken, Jane A (https://experts.colorado.edu/display/fisid_112411)
Distinguished Professor; PhD, Princeton University

Mileti, Dennis S.
Professor Emeritus

Mojola, Sanyu Amimo (https://experts.colorado.edu/display/fisid_145741)
Associate Professor; PhD, University of Chicago

Pampel, Fred
Professor Emeritus

Pedersen-Gallegos, Liane G (https://experts.colorado.edu/display/fisid_107962)
Instructor

Pinto, Leonard J.
Professor Emeritus

Platter, Adele
Professor Emeritus

Pyrooz, David C (https://experts.colorado.edu/display/fisid_155784)
Assistant Professor; PhD, Arizona State University

Radelet, Michael L (https://experts.colorado.edu/display/fisid_121802)
Professor; PhD, Purdue University

Regoli, Robert M.
Professor Emeritus

Rinaldo, Rachel Ann (https://experts.colorado.edu/display/fisid_156309)
Assistant Professor; PhD, University of Chicago

Riosmena, Fernando (https://experts.colorado.edu/display/fisid_144419)
Associate Professor; PhD, University of Pennsylvania

Rogers, Richard G (https://experts.colorado.edu/display/fisid_106129)
Professor; PhD, University of Texas at Austin

Steen, Sara (https://experts.colorado.edu/display/fisid_122698)
Associate Professor; PhD, University of Washington

Sue, Christina Alicia (https://experts.colorado.edu/display/fisid_145679)
Associate Professor; PhD, University of California-Los Angeles

Tierney, Kathleen Jane (https://experts.colorado.edu/display/fisid_125978)
Professor; PhD, Ohio State University

Wadsworth, Thomas Pearson (https://experts.colorado.edu/display/fisid_144382)
Associate Professor; PhD, University of Washington

Walden, Glenda D (https://experts.colorado.edu/display/fisid_105898)
Instructor; PhD, University of Colorado Boulder

Wanderer, Jules J.
Professor Emeritus

Wehr, Paul E.
Professor Emeritus

Wilkins, Amy Catherine (https://experts.colorado.edu/display/fisid_143151)
Associate Professor; PhD, University of Massachusetts at Amherst

Courses

SOCY 5031 (3) Research Design

Principles and practice of social research, including the nature of scientific explanation, the relationship between theory and research, research design, measurement problems, sampling questionnaire construction, interviewing, ethnographic methods, and statistical analysis.

Additional Information: Departmental Category: General Sociology

SOCY 5037 (3) Hazards, Disasters and Society

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4037

Additional Information: Departmental Category: Environment and Society

SOCY 5071 (3) Social Stratification

Studies theories of class, ethnic, sex, and age stratification. Examines social inequality in the United States and analyzes the resulting conflicts.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4071

Additional Information: Departmental Category: General Sociology

SOCY 5111 (3) Data 1: Introduction to Social Statistics

Introduces statistical analysis in the social sciences. Introduces basic techniques of inferential statistics and several bivariate statistical techniques including t-test for the difference in means, chi-square independence, analysis of variance (ANOVA), correlation, and simple regression (OLS). Prepares students for the required course on multivariate regression techniques (Data 2).

Requisites: Restricted to Sociology (SOCY) graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 5181 (3) Logics of Qualitative Inquiry

A required first-year seminar that introduces the logics of qualitative inquiry in sociology. Introduces the history of qualitative epistemology. Considers the logic of common qualitative methodologies and qualitative research representations. Engages with the logics of inquiry in classic and more recent well regarded qualitative sociological works.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Sociology

SOCY 5201 (3) Graduate Seminar in Sociological Theory

Examines theoretical approaches to core issues and problems in sociology, including the nature of society, the relationship between society and the individual, the role of culture and social structure, the sources of social power, and the conceptual structure of sociological knowledge itself.

Requisites: Restricted to Sociology (SOCY) graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 5611 (3) Teaching in Sociology

Learn how to teach sociology more effectively while developing a new content area and a clearer sense of the field. Choose a content area within sociology as the basis for planning a course and developing and practicing different teaching techniques. Department enforced prerequisite: enrollment in the Sociology graduate program.

Additional Information: Departmental Category: General Sociology

SOCY 5841 (1-6) Independent Study in Sociology

Graduate variable credit. Instructor consent required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Sociology

SOCY 5937 (1-6) Graduate Research Internship in Environmental Sociology

Offers the opportunity for sociology graduate students specializing in environmental sociology to work with local governmental or non-profit organizations on research assignments. The research topic, academic reading list, and expectations for the final project will be developed collaboratively with a faculty sponsor and organizational representative.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Environment and Society

SOCY 6004 (3) Topics in Criminology

Variety of courses in criminology to be taught by visiting lecturers. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 6007 (3) Foundations of Environmental Sociology

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 6007

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environment and Society

SOCY 6012 (3) Population Issues, Problems, and Policies

Presents contemporary perspectives on relations between population and society. Focuses on mortality, fertility, and migration, the major demographic areas, with reviews of specific demographic phenomena and controversies.

Additional Information: Departmental Category: Population and Health Issue

SOCY 6016 (3) Topics in Sex and Gender

Covers diverse specializations of faculty in the area of sex and gender. See current departmental announcements or online Schedule Planner for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sex and Gender

SOCY 6017 (3) Inequality, Democracy, and the Environment

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between a) inequality and democratic decision making and b) undemocratic economic and political decision making, U.S. and corporate food and energy policy; and global environmental degradation. Focus will also be placed on the role that global inequality plays in fostering environmental degradation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environment and Society

SOCY 6041 (3) Cultural Sociology

Explores "the cultural turn" in sociology and related disciplines. Reviews basic themes in cultural studies: distinguishing "cultural" and "social"; narrative as catalyst between symbols and practices; cultural production processes; self as embodied; culture and power; methods and epistemological issues. Students present their own projects in class and as research papers.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6111 (3) Data 2: Data Analysis

Introduces students to mainstream multivariate regression techniques used in the social sciences. The majority of the course focuses on the Ordinary Least Square model and on the extension of this model to nominal, ordinal and count dependent variables. Students analyze data of their choosing with statistical software packages including SPSS, SAS, and STATA. Department prerequisite: SOCY 5111 or equivalent.

Additional Information: Departmental Category: General Sociology

SOCY 6121 (3) Qualitative Methods

Training in the systematic observation of people in situations, finding them where they are, staying with them in a role acceptable to them that allows intimate observations of behavior. Students report their findings in ways useful to social science but not harmful to those observed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6821 (1-2) Graduate Sociology Forum 1

Introduces first-year graduate students to the full range of substantive topics, research programs, and other projects in which graduate sociology faculty are engaged. Provides a forum in which issues of the discipline are presented and discussed. Features weekly presentations by graduate sociology faculty.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6831 (1) Graduate Professional Seminar

Offers guidance and instruction on topics related to advanced graduate study and academic life beyond graduation. Discussions will include writing journal articles; creating a vitae; writing dissertations; applying for grants and other sources of funding; the academic job search; and what to expect as a junior faculty member.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6841 (1-6) Guided Research in Sociology

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6851 (2) Interdisciplinary Social Science Professional Socialization

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science.

Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 6831

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Sociology

SOCY 6941 (1) Candidate for Degree for Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Sociology

SOCY 6951 (1-6) Master's Thesis

Additional Information: Departmental Category: General Sociology

SOCY 7002 (3) Social Disparities in Health

Presents social disparities in health in their social context. Includes the sociology of health behavior; links between health status and social statuses including gender, race, ethnicity, and socioeconomic status; fundamental causes and other explanations for social disparities in health; environment and health; health insurance disparities; the physician-patient interaction and its consequences.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Population and Health Issue

SOCY 7004 (3) Criminological Theory

Examines the major criminological theories of the 18th through 21st centuries in Europe, Australia, and the U.S. Emphasizes the historical contexts and paradigms of knowledge influencing these theories.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7006 (3) Sociology of Sex and Gender

Theoretical and empirical examination of sex stratification, sex role differentiation, and sex differences in socialization, personality, institutions, and culture.

Additional Information: Departmental Category: Sex and Gender

SOCY 7012 (3) The Social Demography of Race

Introduction to relevant, timely research within sociological and social demographic research on race and ethnicity. Specific areas will include conceptual/measurement issues; population size, growth, and migration; health and mortality; marriage, family, and fertility; socioeconomic context; and policy considerations. Course content will be structured around current empirical pieces in sociology literature with emphasis on methodological approach in analyses.

Additional Information: Departmental Category: Population and Health Issue

SOCY 7014 (3) Gender, Race, Class, and Crime

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 6014

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7017 (3) Population and Environment

Reviews research on human-environment interactions, with a focus on ways in which demographic processes influence, and are influenced by, the environmental context. Specific topics include conceptual and analytical frameworks; methodologies; intervening factors shaping human dimensions of environmental change; and regionally-focused research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environment and Society

SOCY 7024 (3) Punishment and Social Control

Exploration of sociological perspectives on the criminal justice process. Considers organization of criminal law responses, including enforcing and sentencing. Race, class, gender, and age differences in treatment and sentencing are analyzed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7026 (3) Feminist Research Methods

Epistemological and methodological issues generated by feminist research and students' own projects.

Additional Information: Departmental Category: Sex and Gender

SOCY 7034 (3) Capital Punishment in the United States

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7036 (3) Feminist Theory

Examines the main schools of feminist thought and their impact upon sociological theories. Also examines current feminist theoretical debates and their relevance to feminist sociology.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sex and Gender

SOCY 7111 (3) Data III--Advanced Data Analysis

Denotes third graduate course in sequence of quantitative methods. Following basic inferential statistics (SOCY 5111) and multivariate regression analysis (SOCY 6111), students study advanced statistical techniques such as event history analysis, multilevel modeling, structural equation modeling, and latent class analysis.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of SOCY 6111 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 7121 (3) Qualitative Analysis

Drawing on data gathered through participation, observation and in-depth interviewing, students focus on developing theoretical analyses and exploring classical and post-modern ethnographic writing formats. Students present and revise their papers as well as review journal articles. Department enforced prerequisite: SOCY 6121.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 7131 (3) Seminar in Social Psychology

Studies the individual in social context. Focuses on theoretical perspectives and substantive issues specific to sociological and social psychology, including socialization, the self, social roles, language, deviance, gender, collective behavior, group processes, attitudes and behavior, social norms, and conformity.

Additional Information: Departmental Category: General Sociology

SOCY 7141 (3) Third-year Paper Seminar

Guides graduate students through the creation of the required third-year paper and helps establish productive writing habits. Includes assigned readings, discussion, peer review, and specific tasks related to scholarly writing. Students will revise and defend the paper during the semester following the seminar. Department enforced prereqs., SOCY 5111 and SOCY 5201.

Requisites: Restricted to Sociology (SOCY) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Sociology

SOCY 7171 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 8991 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: General Sociology

Sociology - Doctor of Philosophy (PhD)

Our program offers solid training in the foundational theories and methods of the discipline and allows students the flexibility to pursue interests in a variety of specialty areas. The Department of Sociology at CU Boulder is a well-respected center for teaching and research. Here students can work with award-winning faculty members who have been recognized for their research, teaching and service.

The Department of Sociology strives to maintain a diverse mix of graduate students, promote respect for and opportunities to learn from others with a broad range of backgrounds and experiences, and otherwise promote inclusive excellence. By providing a variety of perspectives, a diverse student body enhances students' educational experiences and strengthens our research and outreach endeavors.

We offer the following areas of specialization:

- criminology
- cultural sociology
- environment, hazards and disasters
- gender and sexuality
- health and medicine
- life course, aging and youth
- political economy
- population
- race and ethnicity
- social psychology and emotions

Community

The department views the recruitment and retention of an inclusive and diverse student body as an essential component of a successful graduate program. Besides enhancing the quality of our program by bringing a larger diversity of experience to it, recruitment and retention of students from many different backgrounds and experiences will increase the diversity in the profession of sociology overall. Our department is committed to improving the diversity of the student body and the graduate program experience.

Students are encouraged to become involved in CU Boulder's United Government of Graduate Students (UGGS) (<http://www.colorado.edu/uggs/about-uggs>). UGGS is committed to enhancing the graduate student experience by interacting with the university administration on matters such as financial aid, etc. UGGS has worked with the Graduate School to develop the Graduate Student Bill of Rights and Responsibilities (<http://www.colorado.edu/uggs/sites/default/files/attached-files/Graduate%20Student%20Bill%20of%20Rights%20and%20Responsibilities.pdf>).

Requirements

Students must complete a total of 45 credit hours of course work before taking the specialty area comprehensive exam. At least 24 hours must be in the Department of Sociology on the Boulder campus. All courses taken within the Department of Sociology must be numbered 5000 or above to qualify for graduate credit.

All first-year course work must be completed with at least a 3.50 GPA and no grade lower than a B to continue into the second year.

At the end of the first and second years, faculty members teaching required courses, faculty mentors/advisors and faculty supervising teaching assistants conduct a review of students' progress.

Required Courses and Semester Credit Hours

Required Courses

SOCY 5031	Research Design	3
SOCY 5111	Data 1: Introduction to Social Statistics	3
SOCY 5181	Logics of Qualitative Inquiry	3

SOCY 5201	Graduate Seminar in Sociological Theory	3
SOCY 6111	Data 2: Data Analysis	3
Electives		
A second theory seminar of the student's choice.		3
Two 1-credit-hour graduate forums:		2
SOCY 6821	Graduate Sociology Forum 1	
Total Credit Hours		20

Master's Degree

The Department of Sociology does not have a master's degree program; however, students who are unable to meet the requirements for the doctoral degree may pursue an MA with Graduate Committee approval. In addition, PhD students may obtain the MA in the process of completing the doctoral degree. The department does not allow extra time for the completion of the MA degree while pursuing the PhD.

All MA students are required to complete a minimum of 30 credit hours of graduate course work. These 30 credit hours must include at least 6 credit hours in at least two seminars in the student's major fields. Students may take a maximum of 6 credit hours of independent study. Independent study may not be substituted for regular seminars. In addition, all students must take courses from at least four faculty members. Finally, all MA students must designate a master's advisory committee that consists of at least three regularly appointed graduate faculty members from the Department of Sociology.

For the MA degree, a student must complete 30 credit hours of course work at the 5000 level or above, including 4–6 thesis credit hours and the required Theory and Methods sequence with a B or higher in addition to the preparation of a written thesis and a successful oral defense of the thesis. Students must register for thesis credit hours in the semester of thesis defense.

Dissertation

Students must prepare a written dissertation proposal and orally defend it before the dissertation committee, and complete dissertation research and defend by the end of the sixth program year.

Recommended Plan of Study

Students enter the program in a cohort of approximately 12 students. Students typically focus on required courses during the first year. Graduate students are expected to take two or three seminars each semester. We encourage students to work with their faculty advisors to determine the course load for the first year based on prior course work, etc. Beyond the first year, we recommend that students take three courses each semester.

Each incoming student will be assigned an individual faculty advisor who will help guide the student through the first year of the program. Under the first-year advising system, students are encouraged to work with their first-year advisors to explore the program, the research specialties of the department and their own developing research interests while getting to know faculty members. Once a student has had an opportunity to meet and work with a variety of faculty, decisions regarding long-term advisors should be made. Beginning in year two of the program, graduate students are expected to seek their own faculty advisors.

Students in their first year are required to attend the graduate forum (SOCY 6821). Students will meet bimonthly throughout the academic year with the forum leader. The primary purposes of the forum are to introduce faculty and their research to the first-year cohort and to provide

a communal forum for the cohort to discuss issues of concern with the forum leader.

The department offers an ongoing professionalization seminar ("prosem") led by a group of elected graduate students.

During the first two years, a student's course work will focus on theory and methods. In the third and fourth years, the student will work with their advisor to develop a specialty area. Upon successful completion of the specialty comprehensive exam, the student will be admitted to candidacy and begin their dissertation research.

Spanish and Portuguese

Ranked as a top graduate program in the nation by the National Research Council, the Department of Spanish and Portuguese offers MA degrees in Peninsular and Latin American Literature as well as Hispanic Linguistics. It also offers PhD degrees in Peninsular and Latin American Literature, and Medieval and Early Modern Hispanic Literatures.

All students are eligible for graduate teaching assistantships. These appointments include a monthly stipend, tuition remission, and cover all student health insurance premiums. Grants and fellowships (summer, research, travel) are also available by application.

Course codes for this program are SPAN and PORT.

Master's Degree

- Spanish - Master of Arts (MA) (p. 1091)

Doctoral Degree

- Spanish - Doctor of Philosophy (PhD) (p. 1090)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Baena, Julio (https://experts.colorado.edu/display/fisid_101497)
Professor; PhD, Georgetown University

Becher, Anne Helen (https://experts.colorado.edu/display/fisid_110035)
Senior Instructor; MA, University of Colorado Boulder

Brown, Esther Lynn (https://experts.colorado.edu/display/fisid_129298)
Associate Professor; PhD, University of New Mexico

Dabove, Juan Pablo (https://experts.colorado.edu/display/fisid_125397)
Associate Professor; PhD, University of Pittsburgh

Elmore, Peter Michael (https://experts.colorado.edu/display/fisid_103089)
Professor; PhD, University of Texas at Austin

Gomez, Leila Gabriela (https://experts.colorado.edu/display/fisid_133563)
Associate Professor; PhD, Johns Hopkins University

Green, Antonia M (https://experts.colorado.edu/display/fisid_103344)
Instructor; MA, University of Missouri-Columbia

Hallstead, Susan Rita (https://experts.colorado.edu/display/fisid_125579)
Senior Instructor; MA, University of Pittsburgh

Herrero-Senes, Juan (https://experts.colorado.edu/display/fisid_147159)
Associate Professor; PhD, Univ Pompeu Fabra (Spain)

Horno-Delgado, Asunción
Professor Emeritus; PhD, University of Massachusetts Amherst

Kopen, Carmen Lynn (https://experts.colorado.edu/display/fisid_127181)
Instructor; MA, University of Colorado Boulder

Krael, Javier (https://experts.colorado.edu/display/fisid_143248)
Associate Professor; PhD, Duke University

Long, Mary K (https://experts.colorado.edu/display/fisid_109994)
Senior Instructor; PhD, Princeton University

Malcolm, Karen L (https://experts.colorado.edu/display/fisid_108575)
Instructor; MA, University of Nebraska-Lincoln

Martuscelli, Tania A. (https://experts.colorado.edu/display/fisid_148379)
Assistant Professor; PhD, University of Massachusetts at Amherst

Molinero, Nina L (https://experts.colorado.edu/display/fisid_105143)
Associate Professor; PhD, University of Kansas

Perez-Pamies, Susanna (https://experts.colorado.edu/display/fisid_147675)
Instructor

Prieto, Andres Ignacio (https://experts.colorado.edu/display/fisid_143948)
Associate Professor; PhD, University of Connecticut

Rivas Rodriguez, Jose Javier (https://experts.colorado.edu/display/fisid_144516)
Associate Professor; PhD, Univ of Santiago De Compostela (Spain)

Schincariol, Marcelo Tadeu (https://experts.colorado.edu/display/fisid_148724)
Instructor

Silleras-Fernandez, Nuria (https://experts.colorado.edu/display/fisid_147213)
Associate Professor; PhD, Univ Autonoma De Barcelona - UAB (Spain)

Tabler, Alicia V (https://experts.colorado.edu/display/fisid_104217)
Instructor; BA, University of Wyoming

Courses

PORT 5110 (3) Brazilian Literature

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays is included.

Equivalent - Duplicate Degree Credit Not Granted: PORT 4110

Additional Information: Departmental Category: Portuguese

PORT 5150 (3) Literature of the Portuguese Speaking World

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

Equivalent - Duplicate Degree Credit Not Granted: PORT 4150

Additional Information: Departmental Category: Portuguese

SPAN 5120 (1-3) Seminar: Spanish Literature and/or Spanish American Literature

Selected topics in Spanish and/or Spanish American literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5130 (1-3) Seminar: Critical Approaches to Hispanic Literature

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7130

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5140 (3) Seminar: Spanish Literature, Medieval Period

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7140

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of SPAN 5420 or SPAN 7420 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5200 (3) Seminar: Spanish Literature, Renaissance and Baroque

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5210 (2-4) Seminar: Spanish Literature, 18th and/or 19th Centuries

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7210

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5220 (1-3) Seminar: Spanish Literature, 20th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7220

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5300 (2-4) Seminar: Spanish American Literature, Colonial Period and/or 19th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7300

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5320 (1-3) Seminar: 20th Century Spanish American Literature

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7320

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5400 (2-4) Seminar: Spanish Phonology

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7400

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5410 (2-4) Seminar: Spanish Syntax

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7410

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5430 (1-3) Seminar: Hispanic Linguistics

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7430

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5440 (3) Seminar: Trends in Hispanic Linguistics

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5450 (3) Introduction to Hispanic Linguistics

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 4450

Additional Information: Departmental Category: Spanish

SPAN 5460 (3) Topics in Spanish Applied Linguistics

Treats topics within the scope of Spanish first and second language acquisition and the speech of bilinguals. Other topics include contrasting linguistics, interlingual stages of learning and code switching as they relate to language acquisition.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7460

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5650 (3) Methods of Teaching Spanish

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 4650

Additional Information: Departmental Category: Spanish

SPAN 6840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 6940 (1) Master's Degree Candidate

Requisites: Restricted to Spanish (SPAN) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Spanish

SPAN 6950 (1-6) Master's Thesis

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7120 (1-3) Seminar: Spanish Literature and/or Spanish American Literature

Selected topics in Spanish and/or Spanish American literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7130 (1-3) Seminar: Critical Approaches to Hispanic Literature

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5130

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7140 (3) Seminar: Spanish Literature, Medieval Period

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5140

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7200 (3) Seminar: Spanish Literature, Renaissance and Baroque

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7210 (2-4) Seminar: Spanish Literature, 18th and/or 19th Centuries

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5210

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7220 (1-3) Seminar: Spanish Literature, 20th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5220

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7300 (2-4) Seminar: Spanish American Literature, Colonial Period and/or 19th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5300

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7320 (1-3) Seminar: 20th Century Spanish American Literature

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5320

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7400 (2-4) Seminar: Spanish Phonology

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5400

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7410 (2-4) Seminar: Spanish Syntax

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5410

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7430 (1-3) Seminar: Hispanic Linguistics

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5430

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7440 (3) Seminar: Trends in Hispanic Linguistics

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7460 (3) Topics in Spanish Language Acquisition and Applied Linguistics

Treats topics within the scope of Spanish first and second language acquisition and the speech of bilinguals. Other topics include contrasting linguistics, interlingual stages of learning and code switching as they relate to language acquisition.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5460

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Spanish

SPAN 8840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

Spanish - Doctor of Philosophy (PhD)

Unique among other departments in the country, the Spanish and Portuguese Department at CU Boulder offers two distinct tracks to our PhD students:

- medieval and early modern Hispanic literatures
- Peninsular and Latin American literatures

Both PhD programs offer students a rigorous yet flexible plan of studies designed to deepen their knowledge of Peninsular and Latin American literatures and cultures.

Our faculty is actively engaged in research and publication in a variety of topics covering the whole range of peninsular and Latin American literatures and cultures, from the role of female leadership in the Peninsular Middle Ages to cultural histories of banditry in Latin America, from Cervantes to the work of contemporary authors like Roberto Bolaño.

At CU Boulder, students work closely with faculty members and are encouraged to pursue their own research interests.

Students wishing to pursue graduate work in Spanish leading to candidacy for advanced degree should carefully read the Master's Degree Requirements section of this catalog.

Requirements

Residence Requirement

PhD students must complete a minimum of one academic year in residence on the Boulder campus (excluding summer) within the four years immediately preceding the date on which they present themselves for the PhD comprehensive examination.

Areas of Concentration

The PhD in Spanish is offered in six literary periods of concentration:

- medieval
- golden age
- 18th and/or 19th century peninsular
- 20th and 21st century peninsular
- colonial and 19th century Spanish American
- 20th and 21st century Spanish American

For further information on these options, contact the department.

Course Requirements

Prior to taking the PhD comprehensive exams, students must complete a minimum of 36 credit hours in graduate seminars in Spanish and/or related fields numbered 5000 or above. Students can take as many as 9 graduate credit hours outside the department. The student's advisor and the associate chair, in consultation with the chair of the department, must approve credit hours in excess of 9, provided that the student formally requests it and gives a compelling reason for the standard limit to be overridden. Approval of the MA degree must also be presented for the PhD. Each advisor, in consultation with the student, will determine which courses will be acceptable.

All PhD students must take at least 30 credit hours of graduate course work at CU Boulder. PhD students may transfer to the department a maximum of 6 hours of acceptable graduate-level credit. Transfer of credits will be considered only at the moment of admission into the program, not later on. Students may take no more than 3 credit hours of independent study courses. Additional independent study has to be approved by the graduate committee, which makes a recommendation to the associate chair of graduate studies or the chair of the department. Under no circumstances can independent study course work exceed 25 percent of the course work required for the PhD degree.

Doctoral students can only take up to 12 credits in course load that are not regular graduate seminars in the Spanish and Portuguese Department. These 12 credits are a combination of credits taken outside of the Spanish and Portuguese Department and independent studies offered by a faculty member of the Spanish and Portuguese Department. If a student decides to take one independent study with their advisor, then the student is allowed to take 9 credits outside the department; this is the recommended situation. If a student takes two independent studies, then they can only take 6 credits outside the department, and so on. No more than 9 credit hours can be used in independent studies, and no more than 9 credit hours can be taken outside the department.

PhD students who did not take a teaching methodology seminar, a literary theory seminar, or a Hispanic linguistics seminar as part of their MA program must do so as part of their PhD program. Those students who did not take a minimum of 3 graduate credit hours in each of the seven subject areas as part of their MA program, must make up course work in these areas as part of the PhD program. The associate chair for graduate studies makes the decision regarding this additional work during the

student's first semester in the program. If this additional work is not completed the semester prior to the PhD exam, students will not be able to take their comprehensive exams.

Language Requirement

The student must demonstrate as early as possible, but at least one full semester before taking the comprehensive examination, a communication knowledge (as defined by the Graduate School) of one foreign language and a reading knowledge of a second language in addition to Spanish. The languages are chosen by the student in consultation with the advisory committee.

Spanish - Master of Arts (MA)

Students wishing to pursue graduate work in Spanish leading to candidacy for advanced degree should carefully read the Master's Degree Requirements (p. 866) section of this catalog.

Areas of Concentration

Literature Concentration

Our MA in Peninsular and Latin American literatures is designed to give the student a broad overview of the cultural productions of the Latin American and Peninsular worlds. MA students are required to take 30 hours of graduate course work.

Linguistics Concentration

Our MA in Hispanic linguistics is an interdisciplinary program that provides students with a solid foundation in linguistics through the course work taken in the Departments of Spanish and Portuguese, Linguistics, Communication, Anthropology and the School of Education. Students have the unique opportunity to work closely in collaboration with faculty to develop their areas of concentration and graduate as specialists in a wide range of topics (e.g., history of the Spanish language, Spanish in the United States, sociolinguistics, etc.)

All MA students in the Hispanic linguistics option are required to take 30 hours of graduate course work. They are required to have their course selections in linguistics approved by their advisor and the associate chair for graduate studies, but they are encouraged to develop an interdepartmental and interdisciplinary course of study. Graduate seminars offered in linguistics, sociology, psychology, anthropology and education can serve as important complements to linguistics courses taken in our department.

Requirements

General Course Requirements

The MA in Spanish is offered in two areas of concentration: one with an emphasis on literature and one with an emphasis on linguistics.

All MA students are required to complete at least 30 hours of graduate course work, at least 25 of which must be completed at CU Boulder. MA students may transfer to the department a maximum of 6 credit hours of acceptable graduate-level courses and may take no more than 6 credit hours of independent study courses.

Courses taken as part of the MA program must be offered by our department or by others upon having been approved by the student's MA supervisory committee (or the associate chair for graduate studies if the committee has not yet been formed). In addition, MA students may not take more than 9 hours of graduate course work in any given semester.

No graduate course in the department may be taken pass/fail by a graduate student in our program. This rule also applies to those courses taken in the Department of Linguistics by our MA students.

Students who are failing a course will not be allowed to drop the course, except under special circumstances. To do so, approval must be secured from the course instructor, the associate chair for graduate studies and the department chair.

Concentration Requirements

Literature Concentration

Required Courses

SPAN 5130	Seminar: Critical Approaches to Hispanic Literature	3
SPAN 4980	Methods Language Learn/Pedagogy	1

Electives

One Hispanic linguistics course:		3
SPAN 5400	Seminar: Spanish Phonology	
SPAN 5410	Seminar: Spanish Syntax	
SPAN 5430	Seminar: Hispanic Linguistics	
SPAN 5440	Seminar: Trends in Hispanic Linguistics	
SPAN 5450	Introduction to Hispanic Linguistics	
SPAN 5460	Topics in Spanish Applied Linguistics	

A minimum of 3 graduate credit hours in each of the following subject areas: 21

Medieval Iberian literature	
Early modern Spanish literature	
Colonial Spanish American literature	
19th-century Spanish American literature	
18th- and 19th-century Peninsular literature	
20th- and 21st-century Peninsular literature	
20th- and 21st-century Spanish American literature	

Additional courses to fulfill the 30-credit minimum. 2

Total Credit Hours 30

Linguistics Concentration

MA students in the Hispanic linguistics option are required to have their course selections in linguistics approved by their advisor and the associate chair for graduate studies, but they are encouraged to develop an interdepartmental and interdisciplinary course of study. Graduate seminars offered in linguistics, sociology, psychology, anthropology and education can serve as important complements to linguistics courses taken in our department.

Required Courses

LING 2000	Introduction to Linguistics	3
SPAN 4980	Methods Language Learn/Pedagogy	1

Electives

One Spanish graduate-level seminar.		3
Additional courses to fulfill the 30-credit minimum.		23
Total Credit Hours		30

¹ Required for students who did not take a similar course as part of their previous course of study. Students who must take LING 2000 are required to do so during their first semester in the program.

Language Requirement

Students must demonstrate, as early as possible and before taking the comprehensive examination, a communication knowledge (as defined by the Graduate School) of a foreign language other than Spanish. They also must be able to speak, read and write English well.

Speech, Language and Hearing Sciences

The graduate curriculum in Speech, Language and Hearing Sciences (SLHS) leads to either a master's or a doctoral degree. The programs in speech-language pathology and audiology are accredited by the Council on Academic Accreditation (CAA) and the Colorado State Department of Education.

Prospective students should read the Master's Degree (p. 866) or Doctoral Degree Requirements (p. 867) sections of this catalog.

Course code for this program is SLHS.

Master's Degree

- Speech, Language and Hearing Sciences - Master of Arts (MA) (p. 1103)

Doctoral Degrees

- Audiology - Doctor of Audiology (AuD) (p. 1099)
- Speech, Language and Hearing Sciences - Doctor of Philosophy (PhD) (p. 1102)

Certificate

- Speech-Language Pathology Assistant - Graduate Certificate (p. 1104)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Arehart, Kathryn H (https://experts.colorado.edu/display/fisid_105561)
Professor; PhD, University of Washington

Brennan, Christine (https://experts.colorado.edu/display/fisid_155861)
Assistant Professor; PhD, Northwestern University

Fredrickson, Tammy L. (https://experts.colorado.edu/display/fisid_148888)
Clinical Asst Professor; PhD, University of Colorado Boulder

Hardin, Kathryn Theresa Yarema (https://experts.colorado.edu/display/fisid_139358)
Clinical Asst Professor; MA, University of Colorado Boulder

Hedberg, Natalie L.
Professor Emeritus

Horii, Yoshiyuki
Professor Emeritus

Jancosek, Elizabeth G.
Professor Emeritus

Kan, Pui Fong (https://experts.colorado.edu/display/fisid_145806)
Associate Professor; PhD, University of Minnesota Twin Cities

Kates, James (https://experts.colorado.edu/display/fisid_146722)
Scholar In Residence

Lewon, Jennifer Walentas (https://experts.colorado.edu/display/fisid_147362)
Clinical Asst ProfessorLecturer

Meyers, Christina Nicole (https://experts.colorado.edu/display/fisid_155857)
Assistant Professor; PhD, University of Arizona

Moers, Willard Lee (https://experts.colorado.edu/display/fisid_114371)
Instructor; MA, Gallaudet University

Perez-Pamies, Susanna (https://experts.colorado.edu/display/fisid_147675)
Instructor

Pollard, Ryan D (https://experts.colorado.edu/display/fisid_153106)
Instructor; PhD, University of Colorado Boulder

Ramig, Peter R.
Professor Emeritus

Ramsberger, Gail (https://experts.colorado.edu/display/fisid_100943)
Associate Professor; DSc, Boston University

Rowinski, Chris Morton (https://experts.colorado.edu/display/fisid_113035)
Lecturer

Sadagopan, Neeraja (https://experts.colorado.edu/display/fisid_144517)
Assistant Professor; PhD, Purdue University

Schick, Brenda (https://experts.colorado.edu/display/fisid_110058)
Professor; PhD, Purdue University

Sharma, Anu (https://experts.colorado.edu/display/fisid_143814)
Professor; PhD, Northwestern University

Snyder, Lynn
Professor Emeritus

Sweetman, Richard H.
Professor Emeritus

Thrasher, Amy H. (https://experts.colorado.edu/display/fisid_120907)
Clinical Asst Professor; MA, University of Colorado Boulder

Weiss, Rita S.
Professor Emeritus

Courses

SLHS 5002 (2) Evidence-based Practice and Research Methods 1

Provides opportunities for students to acquire the knowledge of evidence-based practice (EBP) in the areas of speech, language and hearing sciences (SLHS). Covers topics about EBP in SLHS, levels of evidence and strategies for using scientific evidence in the process of making clinical decisions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5012 (2) Evidence-based Practice and Research Methods 2

Focuses on the knowledge of research methods and the application of research principles into clinical practice. In particular, covers quantitative research methods that are in speech-language pathology clinical settings. Will cover (1) clinical practice and research methods in speech, language and hearing sciences; (2) single-subject designs in clinical settings; (3) introduction to data collection, data organization and data analysis; (4) interpretation and presentation of clinical data. Formerly SLHS 5000.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5032 (3) Competencies and Strategies for the SLPA

Includes roles and responsibilities for the Speech Language Pathology Assistant (SLPA) working in the public schools, service delivery models, health and safety, screening assistive technology, intervention and self reflection and evaluation. Must be accepted in the SLPA certification program.

Requisites: Requires a prerequisite course of SLHS 4918 (minimum grade D-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5112 (2) Clinical Practice I

Provides entering graduate students a framework for beginning their clinical education and building the relationship of theory and research to current clinical practice in speech-language pathology. Key topics for exploration include contemporary professional issues, licensure, professionalism, ethics and ethical conduct, scope of practice, competency development, teaming and collaboration, accountability and multicultural issues. Formerly SLHS 5110.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5122 (1) Clinical Practice II: Assessment and Treatment Planning

Explores critical elements associated with assessment and treatment planning in speech-language pathology. Topic areas include assessment style, interviewing, test selection and techniques of test administration. Diagnosis and treatment planning section includes differential diagnoses, ethics of diagnoses, goal writing and treatment rationale.

Requisites: Requires a prerequisite course of SLHS 5112 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5132 (1) Clinical Practice III: School Based Skills

Targeted skills for implementation in educationally-based settings for speech-language pathologists. Specific coursework will address writing IEPs/IFSPs, expanded work with service delivery models and implementation of state and federal requirements for school based services.

Requisites: Requires a prerequisite course of SLHS 5122 (minimum grade B-).

SLHS 5242 (3) Language Disorders in School Age Children

Addresses the nature, assessment, and treatment of developmental language disorders in school age children.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5252 (3) Acquired Language Disorders in Adults

Introduces the neural bases and medical etiologies of acquired language disorders in adults, explores the ways in which normal language processing may become disordered, and studies current methods of evaluation and treatment design.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5262 (3) Dysphagia

Provides students with background in the anatomical, physiological, and neurological bases of swallowing function and disorders across the lifespan. Etiological factors are presented, as well as various assessment tools and principles of treatment of swallowing disorders in children and adults.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5272 (1) Augmentative Alternative Communication: Theory and Use

Provides an overview of the application of current technology to alternative/augmentative communication. Emphasizes assessment and intervention with nonverbal children and adults with need for alternative/augmentative communication systems. Presents various technological devices and systems. Addresses system selection, programming, development and integration of use in environmental contexts.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5282 (3) Acquired Cognitive Disorders

Explores the theoretical and clinical management of acquired cognitive disorders that impact communication. Includes basic functional neuroanatomy.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5292 (3) Neurogenic Speech Disorders in Adults

Presents the neural bases of normal and disordered speech motor control, teaches assessment and treatment of motor speech disorders in adults, and applies motor control research to clinical problems.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5302 (3) Articulation and Phonological Disorders

Provides overview of phonological development, perception, and production. Presents factors related to articulation and focuses on critical evaluation of traditional and phonological based assessment and intervention procedures. Includes coverage of phonological awareness, metaphonological skills as related to literacy, as well as treatments and principles specific to children with motor speech disorders.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5312 (2) Aging and Communication

Examines normal age-related changes to communication systems. Anatomic and physiological changes to the mechanisms of speech production, audition and the brain will be included, with a focus on the functional impacts of such changes for speech production and perception, cognition, language and social communication.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

SLHS 5332 (3) Voice Disorders

Examines the anatomical and physiological bases for normal and disordered laryngeal function. Explores structural, neuropathologic, functional/behavior and idiopathic voice disorders. Emphasis on assessment and treatment of individuals with voice disorders, including special populations.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5362 (3) Fluency Disorders

Exploration of the nature, differential diagnosis and treatment of fluency disorders across the life-span. Students will develop the requisite skills and knowledge base to provide prevention, consultation, assessment and intervention for fluency disorders. Research bearing on affective, behavioral and cognitive components of stuttering will be reviewed, along with recent data on the neural bases of the disorder. A broad range of treatment approaches will be discussed and demonstrated.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5555 (2) Advanced Topics in Social Communication: Autism Spectrum Disorders

Students will acquire knowledge and skills in the appropriate selection, application and evaluation of interventions for children, adolescents and adults with autism spectrum disorders (ASD) and their families. Evaluation and diagnosis, including development of the IFSP and IEP, will be addressed.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5576 (3) Neuroanatomy and Neurophysiology of Communication

Provides an introduction to the neuroanatomy and neurophysiology that collectively give rise to human communication including speech perception and production. We will consider how speech, language and hearing are represented in and controlled by the central nervous system and how neuropathologies affect processes of communication.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 5602 (3) Communication Challenges in Children: Birth to Six

Emphasizes nature and profile of language and communication disorders affecting infants and young children. Facilitates integration of clinical and theoretical perspectives with specific approaches for family-centered assessment and intervention principles, models and techniques.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5612 (1) Language Learning Disabilities

Focuses on the nature, assessment and treatment of learning disabilities and the role of the speech-language pathologist in working with children, adolescents and adults with LLD.

Requisites: Requires a prerequisite course of SLHS 5242 (minimum grade D-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5674 (3) Signals and Systems in Audiology

Provides in-depth study of instrumentation used by audiologists for hearing aid evaluation and fitting, signal generation and modification, and signal measurement and calibration.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 5848 (1-4) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Practica

SLHS 5849 (1-4) Independent Study 1, M.A.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 5859 (1-4) Independent Study 2, M.A.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 5878 (1-3) Practicum 1: Speech-Language-Learning Appraisal

Provides a supervised clinical experience on campus in appraisal of speech, language, and learning disorders after training at the observational level.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5898 (1-4) Practicum 1: Speech-Language-Learning Intervention

Offers on-campus and off-campus supervised clinical practice in management of speech-language-hearing disorders in children and adults.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5918 (1-3) Audiology Clinical Practicum: Lab

Provides clinical training in the on site Speech, Language and Hearing Center in skills including audiology identification, evaluation and management for adults and children with hearing loss.

Repeatable: Repeatable for up to 16.00 total credit hours.

Requisites: Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5928 (1-4) Audiology Clinical Practicum: Level 1

Provides clinical training in an off-campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Requires a prerequisite course of SLHS 5918 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

SLHS 5930 (4) Speech Language Pathology Assistant Internship

Placement for a minimum of 12 hours per week for a total of 180 hours including 100 direct student contact hours under the supervision of a fully credentialed SLP, to fully develop requisite skills as an SLPA and become employed in a public school setting. Must be accepted into the SLPA certificate program.

Requisites: Requires a prerequisite course of SLHS 4918 (minimum grade D-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5938 (1-4) Audiology Clinic Practicum: Level 2 Educational

Provides clinical training in an off campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5948 (1-4) Audiology Clinic Practicum: Level 2 Medical

Provides clinical training in an off campus medical audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6000 (1-4) Problems in Speech, Language and Hearing Sciences

Studies selected topics related to the theory and management of communication disorders, and theoretical/scientific information related to speech, language, and hearing.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6006 (3) Advanced Hearing Science

Provides advanced study in hearing science, including physical, physiological, and psychological acoustics of both normal and impaired auditory systems. Department enforced prerequisite: graduate standing in SLHS; undergraduate course work in biology or anatomy.

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 6402 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200

Requisites: Restricted to graduate students only.

SLHS 6504 (1) Professional Ethics in Audiology

Overview of ethics and ethical issues in the profession of audiology. Topics to be discussed include code of ethics by professions, approaches to analyzing ethical dilemmas, ethics in relationships with manufacturers, and ethical considerations in teaching, clinical practice and research.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6514 (1) Professional Issues in Audiology

Overview of professional issues related to the profession of audiology. Topics to be discussed include certification, licensure, professional associations, infection control, practice management, federal regulations related to audiology, professional communications and professional relationships.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6544 (3) Auditory Processes: Adult Assessment

Advanced study on the current science surrounding hearing assessment of adults across the age span. Includes theoretical foundations and clinical applications.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6554 (3) Auditory Processes: Child Assessment

Provides advanced study in hearing assessment and management of children across the age span. Topics include epidemiological, medical, audiological, developmental, and rehabilitative aspects of normal and impaired hearing in children.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6564 (3) Auditory Processes: Neurodiagnostics

Provides advanced study in the neural bases of hearing. Includes theoretical foundations and clinical assessment of neurological functioning in auditory systems with both normal and impaired function.

Requisites: Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6614 (3) Fundamentals of Amplification

Discusses theoretical and clinical issues regarding the design, fitting, and evaluation of amplification technology for individuals with hearing loss. Includes the use of behavioral, psychological, electroacoustic, and physiological (real ear) measures in the selection and evaluation of digital and analog hearing aid technology.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6642 (3) Development and Intervention in Childhood Hearing Loss

Reviews development and intervention with children who are deaf and hard-of-hearing, birth through school age. Focuses on speech, auditory training, language, literacy and cognitive development. Formerly SLHS 6640.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 6650 (2) Counseling and Professional Ethics

Explores counseling theories and techniques following the diagnosis of a disability across the life span. Considers issues related to grieving and mourning, parenting, disability, cultural customs, attachment, and relationships. Covers professional ethics and ethical responsibilities.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6660 (1) Multicultural Issues in SLHS and Communication Theory

Provides an in-depth understanding and first-hand knowledge of different racial, ethnic and religious communities, which is necessary to develop and refine multicultural clinical competence. Incorporates scholarly readings and experiential learning in multicultural settings and fosters participants' qualitative research skills.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6670 (3) Adult Aural Rehabilitation

Provides an investigation of the impact of hearing loss on adults. Psychosocial aspects, communication challenges, assessment and intervention for adult hearing disorders including presbycusis, tinnitus, vestibular disorders, auditory central processing disorders and sudden hearing loss.

Requisites: Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to graduate students only.

Recommended: Prerequisites SLHS 7418 and SLHS 7540.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6918 (7) Practicum 2: Speech-Language-Learning Internship

Gives an off-campus experience in a clinical or hospital setting that provides in-depth practice in management of communication disorders of children and adults.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 6928 (1-7) Practicum 2: Public School Internship

Provides an off-campus supervised experience providing extended and in-depth practice involving school-age children in a school classroom.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 6938 (1-10) Audiology Clinic Externship Educational

Provides students with full time off campus experience in an educational audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

Repeatable: Repeatable for up to 21.00 total credit hours.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 6940 (1) Candidate for Degree

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6948 (1-10) Audiology Clinic Externship: Medical

Provides students with full time off campus experience in a medical audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6950 (1-7) Master's Thesis

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7000 (3) Research Designs in Human Communication Sciences and Disorders

Offers an advanced seminar in research designs for human behavior: efficacy, ethnographic, single-subject, quasi-experimental, and experimental designs. Designed to familiarize students with terminologies and research designs frequently used in speech-language-hearing areas.

Recommended: Prerequisite basic statistics.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7200 (3) Business, Management and Ethics in Audiology

Focuses on the business aspects of managing an audiology practice.

Addresses developing a business plan, contracting for services, legal issues, financial reporting, budgeting, pricing, billing and reimbursement, regulatory issues, marketing, personnel management, risk abatement, and business ethics.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7418 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

SLHS 7428 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425

Requisites: Restricted to graduate students only.

SLHS 7450 (3) Audiology Capstone Project

Provides an individualized project for AUD, completed prior to initiation of final clinical year. May be in the form of research-based investigation, an evidence-based position paper, a clinical protocol based on peer-reviewed literature, a grant proposal, or another format approved by AUD committee. Project requires approved proposal by AUD committee and focused study supervised by capstone advisor.

Requisites: Restricted to Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7520 (3) Auditory Processes: Medical and Genetic Bases

Discusses current developments in epidemiology, pathogenesis, and symptomatology of hearing loss. Investigates the genetic bases of hearing loss and deafness. Incorporates clinical decision theory in assessment and intervention. Explores cross-disciplinary topics from genetics, radiology, pharmacology, pathology, and otology.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7530 (3) Auditory Processes: Theory and Application in the School Environment

Focuses on application of routine audiological practices such as screening, assessment, rehabilitation, and instrumentation to children in educational settings. Emphasizes federal education regulations and pertinent case law.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7540 (3) Auditory Processes: Physiology, Assessment, and Management of the Vestibular System

Emphasizes current research on physiology of the vestibular system, including both structure and function. Considers the etiology of both peripheral and central pathologies of the vestibular system. Discusses ways to assess function of the vestibular system as well as theoretical and practical considerations of vestibular rehabilitation.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7550 (2) Mgmt and Prev of Noise and Noise Induced Hearing Loss

Discusses effects of noise and other damaging agents on the physiology of the auditory system. Highlights principles of hearing conservation programs. Focuses on prevention, identification, and management of occupational hearing loss and current legislation as it pertains to occupational safety and hazards.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7554 (1) Audiometric Instrumentation and Calibration

Introduces students to the basic concepts of electroacoustic transduction, and demonstrates the application of these concepts to the measurement and calibration of audiometric instrumentation. Students will become familiar with standard measurement equipment including multimeters, oscilloscopes, and sound level meters; and will become familiar with calibration standards for instruments including the audiometer, tympanometer, and electrophysiological amplifiers.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7614 (3) Implantable Devices: Technology and Clinical Application

Examines technological aspects and clinical applications of implantable prostheses such as cochlear implants, brainstem implants, hybrid cochlear implants, Baha devices and middle ear implants. Topics will include: history of implantable devices, anatomy and histopathology of the inner ear, speech processing in implants, mapping devices, candidacy criteria, behavioral and electrophysiologic techniques for assessment and outcomes in implanted children and adults.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7640 (3) Communication Processes and Hearing Loss: Birth through Six

Provides in-depth study of current research literature and its implications for clinical practice regarding development of communication processes in the first six years of life and impact of hearing loss. Investigates development of language, auditory perception, speech production, social-emotional abilities, and cognition.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7714 (3) Advanced Topics in Amplification

Discusses advanced issues in the design and fitting of hearing aid technology, including advanced signal processing, outcomes assessment, evidence-based practice and specialized fitting protocols for pediatric and geriatric populations. Current research is integrated with clinical case studies to guide the development of evidence-based practice in hearing aid fittings.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7849 (1-4) Independent Study 1, PhD

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 7859 (1-4) Independent Study 2, PhD

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 7918 (3) Practicum 3: Clinical Supervision

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 8918 (3) Practicum 3: Classroom Instruction

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 8928 (3) Practicum 3: Research Coordination

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

Audiology - Doctor of Audiology (AuD)

The AuD is the entry-level degree in clinical audiology that emphasizes both clinical competency development and evidence-based practice. Students in the AuD program complete a four-year curriculum that includes academic course work, clinical practicum and a capstone project. Students take advanced seminars in hearing science, clinical audiology and research methods.

Students have the opportunity to pursue clinical research in both laboratory and clinical settings, with faculty in a wide range of areas including electrophysiology, psychological acoustics, physiological acoustics, diagnostic evaluation and intervention procedures for newborns through geriatrics, advanced amplification, speech perception in noise, assistive technologies, cochlear implants, vestibular assessment techniques and aural habilitation and rehabilitation of individuals with hearing loss. Furthermore, students undertake clinical practica to develop competency across the scope of practice consistent with national clinical certification and/or licensure in audiology. They will have the opportunity to complete clinical rotations in several different settings including full use of laboratories and suites in the Department of Speech, Language & Hearing Sciences. Clinical rotations occur at sites such as University of Colorado Hospital (UCH) in Denver and the UCH outpatient Boulder clinic, Children's Hospital Colorado, local school districts, and other clinical settings throughout the metro Boulder and Denver area. Students complete fourth-year externships in Denver hospitals or clinical settings throughout the nation.

Dual Degree Program

AuD/PhD in Audiology and Speech, Language and Hearing Science

The department offers students the opportunity to pursue an integrated program of study leading to dual doctorate degrees in the fields of audiology and hearing science. The PhD/AuD dual degree program trains students in both clinical research and clinical practice in audiology. Students in the program gain training that will prepare them to become independent scholars, teach in higher education, conduct research, become certified clinical audiologists and gain leadership skills. The dual degree program allows students to pursue both their clinical training and their research training in a rigorous, intensive and streamlined program.

Requirements

Prerequisite Course Work

The AuD faculty recommends that students complete undergraduate courses covering the following six topics prior to beginning the graduate program in SLHS:

- audiological evaluation

- hearing science
- language development
- phonetics
- speech disorders
- language disorders

Courses covering speech science and audiological rehabilitation are also recommended, but are optional. That said, some students come in with non-SLHS backgrounds in which they have had some but not all of the background knowledge necessary for the program.

Students can work with faculty to test out of courses by successfully taking the exams from the undergraduate course work and demonstrating at least an 80 percent competency. This evaluation option is suggested only when students have already had significant work or educational experiences that have provided them with significant background options in specific areas.

See the department's AuD Prerequisites (<http://www.colorado.edu/slhs/node/442/attachment>) for requirements and course equivalencies.

Sample Four-Year Plan of Study

The following is an example of the course sequence of the AuD program.

Program Begins in an Even Year

Course	Title	Credit Hours
Year One		
Fall Semester		
SLHS 5576	Neuroanatomy and Neurophysiology of Communication	3
SLHS 5918	Audiology Clinical Practicum: Lab	1-3
SLHS 6544	Auditory Processes: Adult Assessment	3
SLHS 6564	Auditory Processes: Neurodiagnc	3
SLHS 6614	Fundamentals of Amplification	3
	Credit Hours	13-15
Spring Semester		
SLHS 5918	Audiology Clinical Practicum: Lab	1-3
SLHS 6006	Advanced Hearing Science	3
SLHS 6554	Auditory Processes: Child Assessment	3

SLHS 7000	Research Designs in Human Communicational Sciences and Disorders	3
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Credit Hours 10-12

Summer

SLHS 5918	Audiology Clinical Practicum: Lab	1-3
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Credit Hours 1-3

Year Two

Spring Semester

SLHS 5918	Audiology Clinical Practicum: Lab	1-3
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SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4
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SLHS 6650	Counseling and Professional Ethics	2
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SLHS 7200	Business, Management and Ethics in Audiology	3
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SLHS 7550	Mgmt and Prev of Noise and Noise Induced Hearing Loss	2
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SLHS 7554	Audiometric Instrumentation and Calibration	1
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Credit Hours 10-15

Summer

SLHS 5918	Audiology Clinical Practicum: Lab	1-3
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Credit Hours 1-3

Year Three

Fall Semester

SLHS 5674	Signals and Systems in Audiology	3
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SLHS 5918	Audiology Clinical Practicum: Lab	1-3
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SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4
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SLHS 6670	Adult Aural Rehabilitative	3
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SLHS 7614	Implantable Devices: Technology and Clinical Application	3
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Credit Hours 11-16

Spring Semester

SLHS 5918	Audiology Clinical Practicum: Lab	1-3
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SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4
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SLHS 7450	Audiology Capstone Project	3
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SLHS 7540	Auditory Processes: Physiology, Assessment and Management of the Vestibular System	3
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SLHS 7714	Advanced Topics in Amplification	3
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Credit Hours 11-16

Summer

SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4
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SLHS 6938	Audiology Clinic Externship Educational	1-10
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Credit Hours 2-14

Year Four

Fall Semester

SLHS 6938	Audiology Clinic Externship Educational	1-10
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Credit Hours 1-10

Spring Semester

SLHS 6938	Audiology Clinic Externship Educational	1-10
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Credit Hours 1-10

Total Credit Hours 61-114

Program Begins in an Odd Year

Course	Title	Credit Hours		
Year One				
Fall Semester				
SLHS 5576	Neuroanatomy and Neurophysiology of Communication	3		
SLHS 5918	Audiology Clinical Practicum: Lab	1-3		
SLHS 6544	Auditory Processes: Adult Assessment	3		
SLHS 6564	Auditory Processes: Neurodiagnoc	3		
SLHS 6614	Fundamentals of Amplification	3		
	Credit Hours	13-15		
Spring Semester				
SLHS 5918	Audiology Clinical Practicum: Lab	1-3		
SLHS 6006	Advanced Hearing Science	3		
SLHS 6554	Auditory Processes: Child Assessment	3		
SLHS 7000	Research Designs in Human Communical Sciences and Disorders	3		
	Credit Hours	10-12		
Summer				
SLHS 5918	Audiology Clinical Practicum: Lab	1-3		
	Credit Hours	1-3		
Year Two				
Fall Semester				
SLHS 5674	Signals and Systems in Audiology	3		
SLHS 5918	Audiology Clinical Practicum: Lab	1-3		
SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4		
SLHS 6670	Adult Aural Rehabilitation	3		
SLHS 7614	Implantable Devices: Technology and Clinical Application	3		
	Credit Hours	11-16		
Spring Semester				
SLHS 5918	Audiology Clinical Practicum: Lab	1-3		
SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4		
SLHS 7450	Audiology Capstone Project	3		
SLHS 7540	Auditory Processes: Physiology, Assessment, and Management of the Vestibular System	3		
SLHS 7714	Advanced Topics in Amplification	3		
	Credit Hours	11-16		
Summer				
SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4		
SLHS 6938	Audiology Clinic Externship Educational	1-10		
	Credit Hours	2-14		
Year Three				
Fall Semester				
SLHS 5918	Audiology Clinical Practicum: Lab	1-3		
SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4		
SLHS 7520	Auditory Processes: Medical and Genetic Bases	3		
SLHS 7530	Auditory Processes: Theory and Application in the School Environment	3		

SLHS 7640	Communication Processes and Hearing Loss: Birth through Six	3
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	Credit Hours	11-16
Spring Semester		
SLHS 5918	Audiology Clinical Practicum: Lab	1-3
SLHS 5938	Audiology Clinic Practicum: Level 2 Educational	1-4
SLHS 6650	Counseling and Professional Ethics	2
SLHS 7200	Business, Management and Ethics in Audiology	3
SLHS 7550	Mgmt and Prev of Noise and Noise Induced Hearing Loss	2
SLHS 7554	Audiometric Instrumenta and Calibration	1
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	Credit Hours	10-15
Summer		
SLHS 5918	Audiology Clinical Practicum: Lab	1-3
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	Credit Hours	1-3
Year Four		
Fall Semester		
SLHS 6938	Audiology Clinic Externship Educational	1-10
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	Credit Hours	1-10
Spring Semester		
SLHS 6938	Audiology Clinic Externship Educational	1-10
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	Credit Hours	1-10
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	Total Credit Hours	72-130

Speech, Language and Hearing Sciences - Doctor of Philosophy (PhD)

The PhD program is grounded in research. Supervisory, administrative, instructional and research activities acquaint students with problems and concepts at a higher level of professional activity and responsibility. Students in the PhD program gain the knowledge and skills that will prepare them to become independent scholars, teach in higher education, conduct research, and become leaders within the discipline.

Wide latitude prevails in planning individual PhD programs. It is expected that students have some professional experience before entering the program and that they have specific academic or professional goals in mind. PhD students must take a four-course sequence in statistics, four core courses within Speech, Language and Hearing Sciences (SLHS), complete the preliminary and comprehensive examinations and successfully defend a dissertation research project. Beyond that, student degree plans are individually designed through the joint efforts of the student and an advisory committee.

Dual Degree Programs

Students may pursue a dual PhD with neuroscience (p. 1076) or cognitive science (p. 950). In addition, the department offers students the opportunity to pursue an integrated program of study leading to dual doctorate degrees in the field of audiology and speech, language and hearing science. The PhD/AuD dual degree program trains students in clinical research and clinical practice in audiology. The dual degree program allows students to pursue both their clinical training and their research training in a rigorous, intensive and streamlined program. Students may apply to both programs simultaneously, or may apply to the PhD portion after having been accepted into the AuD portion or may apply to the AuD portion after having been accepted into the PhD portion.

For more information, visit the department's Graduate Coursework (<http://www.colorado.edu/slhs/graduate-coursework>) webpage.

Requirements

The student will select an advisory committee during the first semester of his or her program. Then the student will develop a plan of study in conjunction with the advisory committee during the first year of doctoral study. The plan of study will detail the student's goals, course work to be completed to meet those goals and departmental and Graduate School requirements, and a proposed schedule for completion of doctoral work. The plan of study will become the student's blueprint for their doctoral work. The advisory committee must approve the plan of study, which may be amended later with the committee approval.

Departmental and Graduate School requirements for doctoral students are intended to allow maximum flexibility in developing a plan of study. All students take three SLHS doctoral seminars, at least 12 credit hours in statistics and research tools, and additional course work in their own research area. There is no foreign language requirement. The Graduate School specifies that not more than 25 percent of course work can be taken through independent study.

Required Course Work

Three doctoral-level SLHS seminars	9
At least 15 credit hours in the student's major content area.	15

One teaching practicum:	3
SLHS 8918 Practicum 3: Classroom Instruction	
One research practicum.	3
Two courses each in statistics and research tools.	12-15
Thirty hours of doctoral dissertation credit.	30
SLHS 8990 Doctoral Dissertation	
Total Credit Hours	72-75

Upon approval of the advisory committee, a maximum of 21 credit hours of course work may be transferred to fulfill the above requirements. This should be accomplished by the end of the first semester of doctoral study. Requests must be made to the Graduate School on a form, which they provide; an official transcript must accompany the request.

In order to continue in the program, a grade point average of 3.50 or better on course work every semester will be required as well as continued recommendation of the SLHS faculty advisory committee. Grades below B- will not count toward a doctoral degree.

The minimum registration requirement for doctoral students is six semesters beyond the attainment of an acceptable bachelor's degree. Two semesters of minimum registration credit may be allowed for a master's degree from an accredited institution; however, at least four semesters of minimum registration credit, two of which must be consecutive in one academic year, must be earned for work taken at CU Boulder.

Speech, Language and Hearing Sciences - Master of Arts (MA)

Focus Areas

There are two areas of focus available at the MA level:

1. MA leading to professional certification in speech-language pathology
2. research

Professional Certification Focus

The master's degree program leading to professional certification in speech-language pathology (MA-SLP) is designed to provide a theoretically and clinically rich path for students planning to work as speech-language pathologists in medical, educational, and private practice settings. Students in the MA-SLP program are provided with a strong foundation of theoretical and clinical knowledge through their course work and clinical experiences.

Students completing the MA-SLP program obtain a Master of Arts degree from the University of Colorado and are eligible to receive the Certificate of Clinical Competence in speech-language pathology from the American Speech-Language-Hearing Association (<http://www.asha.org>) (ASHA) upon successful completion of the clinical fellowship year and the national PRAXIS examination. Students can also apply for Colorado State Licensure to work in the public schools.

Research Focus

The master's program with a research focus allows students to design their own master's degree in SLHS in any topic related to speech, language or hearing sciences. This degree does not result in clinical certification. Working with an advisor, students design a plan of study,

with course work within SLHS and from other departments. A master's thesis is required.

Requirements

Program Requirements

Professional Certification Focus

The master's program with a professional certification focus is a two-year (24-month) program that culminates in one or two internships and either successful passage of the comprehensive exam or completion of a thesis. The program consists of an initial summer intensive session beginning in early August and ends in late July two years later. Students are enrolled for August intensive, fall year 1, spring year 1, summer year 1, fall year 2, spring year 2, and summer year 2.

Within departmental and ASHA guidelines, master's students with a focus in speech-language pathology complete a core set of seminars and clinical assignments that assure at least minimal competence in the full scope of practice for speech-language pathologists. In addition, students complete at least three of six electives that provide the opportunity to develop greater knowledge and skills in areas of specific interest. Clinical assignments are initiated in the on-site Speech, Language and Hearing Center; later, student input is obtained in making off-campus clinical assignments in educational and medical settings.

Students with an undergraduate degree in speech-language pathology and audiology can expect to complete the program in two calendar years (see the MA-SLP (<https://www.colorado.edu/slhs/graduate/masters-degree-leading-asha-certification-speech-language-pathology>) webpage). Those without such a background are required to make up undergraduate deficiencies, which normally require at least an additional 18 credit hours of courses in speech, language and hearing sciences and related disciplines.

Students must meet standards for both academic and clinical competence, as well as professional conduct. Full-time graduate study is required.

Research Focus

The research focus is designed for students who are not seeking clinical certification.

Working with an advisor, students design a plan of study with course work from SLHS and other departments. A master's thesis is required. The non-clinical master's degree in SLHS requires 30 credit hours of graduate course work, with four to six credit hours devoted to the master's thesis. For more information, visit the Thesis Option (<http://www.colorado.edu/slhs/thesis-option>) webpage.

At least 24 hours must be completed at the 5000 level or above. A maximum of 6 credit hours may be completed at the 3000 or 4000 level at the discretion of the academic department. Students may be able to transfer up to 9 credit hours of graduate credit towards this degree. The non-clinical master's degree requires close work with a faculty member of your choosing. Students interested in pursuing this degree option are encouraged to talk with SLHS faculty members who share their interests before applying (see the Meet Us (<http://www.colorado.edu/slhs/meet-us>) webpage).

Speech-Language Pathology Assistant - Graduate Certificate

Speech-Language Pathology Assistants (SLPAs) work directly with students with communication challenges in public school settings under the supervision of a fully qualified and nationally certified speech-language pathologist (SLP). SLPAs have a significant role in enhancing the quality of services for children and adolescents that need support for speech, communication, reading, and writing. This certificate program provides the opportunity to meet the requirements for SLPA authorization in the state of Colorado, through the Colorado Department of Education to work in Colorado public schools. Candidates develop the knowledge and skills to work under the supervision of a certified SLP in the public school setting with ages 0-21. This certificate is appropriate for individuals with a BA in speech, language, and hearing sciences (SLHS), those completing a BA in SLHS (enrolled in their last semester of senior year at CU), or individuals with a BA in another field, who have completed or are completing equivalent leveling coursework (24 hours) through an approved SLHS department. See coursework required as listed under Apply (<http://www.colorado.edu/slhs/online/slpa-certificate-program/requirements-admission>).

The Colorado Department of Education (<http://www.cde.state.co.us>) currently has an "authorization" credential for SLPAs who meet qualifications to work in Colorado public schools under the supervision of qualified MA-CCC-SLP speech-language pathologists. Please search for SLPA authorization.

The program at CU Boulder was developed to address shortages of qualified personnel to extend services to special education students, especially in high-need districts and rural areas in Colorado. This was accomplished through collaboration with our consortium partners at UNC and MSUD. The program is competitive and requires complete applications in electronic format. Preference for in-state students and especially qualified students in rural areas is given. A specific number of seats are reserved for Colorado students who qualify and are sponsored by BOCES to participate in the program. Out-of-state students are considered only if they can arrange a local internship in a public school setting with an MA CCC- SLP.

Deadline(s) for Completed Applications:

Spring 2017~ October 24, 2016

Fall 2017 ~ March 24, 2017

Students will register for two courses to be taken in the semester for which they have been admitted. These courses are as follows:

SLHS 5032: Competencies & Strategies for the SLPA (3 credits) Fall/Spring Semester. Includes Roles and Responsibilities of the SLPA, Working in the Public Schools, Service Delivery Models, Health and Safety, Screening, Assistive Technology, Introduction to Intervention, Documentation, Self Reflection and Evaluation.

SLHS 5930: SLPA Internship (4) Fall/Spring Semester. Placement for 12-15 hours per week for a total of 180 hours including a minimum of 100 hours of direct contact (face to face interaction with students) in a public school setting under the 50% supervision of an MA-CCC SLP.

Theatre & Dance

The Department of Theatre & Dance offers the following graduate degrees:

- MA in Theatre and Performance Studies
- MBA/MA in Theatre offered jointly with the CU Leeds School of Business
- PhD in Theatre and Performance Studies
- MFA in Dance
- Professional MFA in Experience Design

These programs combine traditional studies with practical training. Ambitious seasons of theatre productions and dance concerts feature student performers, designers, directors and choreographers. Guest artists of national and international fame often participate in curricular and extracurricular activities. Recent guests have included Millicent Johnnie, Ananya Chatterjea, Maria Bauman, Jane Hawley, Tim O'Donnel, Ms. Prissy, April Rose, Chris Aiken and Angie Hauser, Art Bridgman/Myrna Packer, Heidi Henderson, Kathleen Hermesdorf, Deborah Jowitt, Darrell Jones, Susan Marshall & Co., Bebe Miller, David Dorfman, Joe Goode, Kevin Wynn, John Scott, Teena Marie Custer and Shelley Senter in Dance; Jim Doyle, Lisa Wolfe, Chris Jones, Jennifer Hubbard, Geoffrey Kent, Eric Van Baars, Silvia Gregory, Gary John LaRosa, Ami Dayan, Terry Berliner, Lee Blessing, Jill Dolan, Elizabeth Dowd, Melanie Marnich, Jim Moody, Tim Miller, Holly Hughes, Jane Page, Joan Schirle, Karen Finley and Mark Medoff in Theatre.

Students interested in Theatre, Dance and Experience Design are urged to consult with an advisor in the appropriate field to obtain both advice and the most current information concerning program opportunities and expectations.

Departmental Requirements. Students wishing to pursue graduate work in Theatre, Dance or Experience Design should carefully read both requirements for advanced degrees in the Graduate School section and the individual degree handbooks published on the Theatre and Dance (<http://www.colorado.edu/theatredance>) website. Students should note that departmental requirements are sometimes more comprehensive than those minimums established by the Graduate School.

Prerequisites. Applicants are admitted to the graduate programs in Theatre, Dance and Experience Design on the basis of their academic records and recommendations. Students may be admitted provisionally but must expect a significant number of additional courses and credit hours that will be required of them to make up deficiencies.

Applications for Dance. Applicants are expected to show a high level of proficiency in dance performance and choreography. The deadline for all applications is December 1. Applicants who want to apply for program support in the form of Graduate Part-Time Instructor (GPTI) positions must apply by December 1. Applicants for the MFA program in Dance must audition in person; international students may audition in digital format. Auditions are held in January for admission the following fall. The specific audition dates can be found on the department website. The Dance program does not accept applications for spring admission.

Applications for Theatre. The deadline for applications from U.S. citizens and permanent residents is December 15. The deadline for applications from non-U.S. citizens is December 1. Both December deadlines are for admission the following fall. The Theatre program does not accept applications for spring admission.

Applications for Experience Design. The Professional MFA in Experience Design admits a new cohort of 8-12 students every other Fall semester. Applications will be accepted December 15, 2016 – April 1, 2017 for Fall

2017 entry. The next application cycle will begin December of 2018 for Fall 2019 entry.

Advising Meeting. Every student will have a meeting with faculty upon entering the program. Topics discussed in the meeting and other available information are employed to design the best possible course of study for the student. If the student has been admitted provisionally, this meeting will plot out the necessary coursework above and beyond the required hours for the degree.

All candidates for a degree have the responsibility of making certain that the appropriate persons or committees have been appointed to supervise the various steps in their graduate programs. Detailed instructions can be found in the handbook for each degree, available from the department website.

Course codes for this department are THTR, DNCE, TDXD and THDN.

Master's Degrees

- Dance - Master of Fine Arts (MFA) (p. 1112)
- Experience Design - Master of Fine Arts (MFA) (p. 1114)
- Theatre - Master of Arts (MA) (p. 1116)

Doctoral Degree

- Theatre - Doctor of Philosophy (PhD) (p. 1115)

Certificate

- Applied Shakespeare - Graduate Certificate (p. 1112)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bergner, Bruce Alan (https://experts.colorado.edu/display/fisid_113315)
Associate Professor; MFA, University of Illinois at Chicago

Cobin, Martin T.
Professor Emeritus

Coleman, Bertram E (https://experts.colorado.edu/display/fisid_103065)
Professor; PhD, University of Texas at Austin

Court, Iain Maxwell (https://experts.colorado.edu/display/fisid_156486)
Instructor; MEd, University of Wollongong (Australia)

Cripe, Kerry M (https://experts.colorado.edu/display/fisid_126542)
Senior Instructor; MFA, Florida State University

Devin, Richard
Professor Emeritus

Diachenko, Nada (https://experts.colorado.edu/display/fisid_101362)
Professor; MA, New York University

Ellsworth, Michelle (https://experts.colorado.edu/display/fisid_112060)
Professor; MFA, University of Colorado Boulder

Gerland, Oliver W (https://experts.colorado.edu/display/fisid_101092)
Associate Professor; PhD, Stanford University

Haig, Robin
Professor Emeritus

Hankin, Toby R.
Professor Emeritus

Harris, Lorenzo R. (https://experts.colorado.edu/display/fisid_147634)
Artist in Residence

Henry, Mark Allen (https://experts.colorado.edu/display/fisid_134379)
Associate Professor; MFA, University of Connecticut

Irey, Charlotte York
Professor Emeritus

Lane, Constance Irene (https://experts.colorado.edu/display/fisid_149778)
Instructor; BA, Beloit College

Lessley, Merrill J.
Professor Emeritus

Manno, Jesse J (https://experts.colorado.edu/display/fisid_120813)
Senior Instructor

Mason, Gesel R (https://experts.colorado.edu/display/fisid_149966)
Assistant Professor; MFA, University of Colorado Boulder

Mejia, Donna (https://experts.colorado.edu/display/fisid_151942)
Assistant Professor; MFA, Smith College

Meneghini-Stalker, Tamara L. (https://experts.colorado.edu/display/fisid_146090)
Associate Professor Assistant Professor; MFA, Northern Illinois University

Nichols, Lynn Wayne (https://experts.colorado.edu/display/fisid_103654)
Senior Instructor; PhD, University of Colorado Boulder

Osnes, Mary Beth (https://experts.colorado.edu/display/fisid_102607)
Associate Professor; PhD, University of Colorado Boulder

Pang, Cecilia J (https://experts.colorado.edu/display/fisid_129479)
Associate Professor; PhD, University of California-Berkeley

Persons, Charles Howard (https://experts.colorado.edu/display/fisid_145012)
Associate Professor; MFA, Columbia University In the City of New York

Potts, Margaret Lee
Professor Emeritus

Randall, Erika Anne (https://experts.colorado.edu/display/fisid_144755)
Associate Professor; MFA, Ohio State University

Shannon, Robert J.
Professor Emeritus

Sowah, Nii Armah (https://experts.colorado.edu/display/fisid_115125)
Senior Instructor; MA, Lesley College

Spanier, Nancy L.
Professor Emeritus

Stark, Theodore (https://experts.colorado.edu/display/fisid_118462)
Senior Instructor; MFA, Boston University

Symons, James M.
Professor Emeritus

Williams, Letitia S.
Professor Emeritus

Yang, Daniel
Professor Emeritus

Courses

DNCE 5001 (2) Graduate Technique

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5012 (1) Concert Production

Meets with DNCE 4012.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Production

DNCE 5014 (2) Graduate Rhythmic Skills

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, poly-meter, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class. Meets with DNCE 3014.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Music

DNCE 5015 (3) Movement Analysis

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 4015.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Movement Awareness Injury Prevent for the Dancer

DNCE 5016 (3) Creative Dance for Children

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4016 (with addition of readings and a paper)

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 5017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4017, with addition of graduate papers and/or a project

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 5023 (2) Performance Improvisation Techniques

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4023 (with the addition of written analysis and creative assignments)

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Creative Process

DNCE 5024 (2) Graduate Musical Resources

Examines how musical choices can profoundly affect audiences, dancers, and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues. Meets with DNCE 3024.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Music

DNCE 5036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4036

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 5038 (1-3) Dance Repertory

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Graduate students are required to keep a log of the learning process involved in repertory to document and analyze each work in terms of stylistic differences, musical/sound accompaniment and trends. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4038

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Performance

DNCE 5047 (3) Hip-Hop Dance History

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 4047.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 5048 (1-4) Performance and Community Engagement

Engages students in harnessing the power of performance for effecting positive social change. Students work collaboratively to create performances and workshop experiences. Readings will provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations to internationally author the future they want. Open to all forms of performance - music, film, dance, theatre.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Performance

DNCE 5052 (1-3) Studio Concert

Provides the opportunity for choreographic and performative synthesis and experimentation via the execution of a project related to the student's major area of creative research. Project must be approved by the student's first reader.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Production

DNCE 5053 (3) Advanced Dance Composition

Meets with DNCE 4053.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Creative Process

DNCE 5056 (2) Graduate Teaching Seminar

Examines practical, pedagogical, philosophical, and legal issues in current dance education. The goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. Provides practice in practical application of theoretical material. All genres of dance may be utilized.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 5064 (2) Music and Dance Seminar: Collaboration

Investigates music in relation to dance performance, choreography, and teaching. Topics may include: a survey of musical styles and composers; direct experimentation with composition and recording techniques; enhancement of rhythmic versatility; work with accompanist/composers; and/or improvement of analytical listening and writing skills.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Music

DNCE 5101 (1) Intermediate Graduate Ballet

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5128 (1) Ballet Repertory

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and Neo-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 4128.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Performance

DNCE 5261 (1) Advanced Jazz Dance Technique

Refines advanced students' approach to the nuances and virtuosity of the jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 4261.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5301 (2) Graduate Hip-Hop

Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. The course focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only. Meets with DNCE 3301.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 5601 (2) Alexander Technique for Graduate Students

Studies how human reaction, coordination, and movement play a role in all activities. Graduate students will explore direct application to dance training, performance, choreography, and teaching. Through in-depth class discussions, movement exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 3601.

Requisites: Restricted to Dance (DNCE) or Theatre (THTR) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5701 (2) Contact Improvisation 2

Moves into rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 4701.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5801 (2) Grad Technique: Multiple Accompanists

Encompasses range of dance forms that require multiple accompanists.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 5901 (1-3) Graduate Technique Practicum

Offers special courses in the technique series. Course may meet at the same time with an undergraduate studio course and includes the practical movement experience with an additional scholarly study of specially chosen issues in dance.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5909 (1-4) Special Topics

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 2909 and DNCE 4909

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 5919 (1-3) Dance Practicum

Project in dance under supervision of senior faculty.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4919

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6009 (1) Research Strategies and Techniques

Examines research methodologies appropriate to the performing arts, particularly theatre and dance. Projects are aimed at familiarizing graduate students with the library and other resources, and the development of thesis and dissertation prospectuses.

Equivalent - Duplicate Degree Credit Not Granted: THTR 6009

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6016 (2) Teaching Lab-Contemporary Dance

Provides opportunity to apply principles and skills introduced in DNCE 5056. Participating students share the responsibility for teaching a lab class that meets twice a week. Focuses on development, analysis and evaluation of teaching skills.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 6017 (3) Readings in Dance

Serves to familiarize participants on a broad range of issues and artists influencing current dance production, performance, and practices. All genres of dance may be utilized to cultivate new capacities in critical thought, written expression, personal ethics, and artistic depth.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 6047 (3) Seminar: Dance

Intensive study of selected topics related to the art of dance, dance criticism, dance aesthetics, and dance in relationship to historical, social, and cultural environments with an emphasis on contemporary American forms and their roots.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 6056 (2) Professional Development

Examines current trends and issues in dance education and the professional dance world. Explores curriculum development, administration, and job opportunities along with other topics such as grant writing, community engagement, dance advocacy, and working as an independent artist.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 6073 (3) Choreography

Covers in-depth practical and theoretical approaches to dance composition for graduate students; solo and group forms; and analysis of historical and contemporary dance works.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Creative Process

DNCE 6101 (1) Advanced Graduate Ballet

Open only to graduate dance majors.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 6849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6919 (1-3) Directed Studies

Explores advanced topics in dance not regularly covered in the curriculum of the graduate program.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6949 (1) Candidate for Degree

Requisites: Restricted to Dance (DNCE) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Independent Study

DNCE 6959 (1-6) Master's Thesis

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6969 (1-6) The Graduate Project

Provides the opportunity for synthesizing the graduate experience through the execution of a project related to the student's major area of interest. Project must be approved by the graduate faculty advisor.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

TDXD 5005 (3) Design Technology 1: Visual Technology

Explores the established and cutting edge technologies employed to implement the visual elements of designed environments and experiences. Develops an understanding of the function of these areas, the ways in which they interact in a complete experience and the new directions of experimentation. Elicits research, analysis and development of new concepts in response to design problems as the core modality of this course.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5105 (3) Collaboratory in Experience Design 1

Addresses philosophies of storytelling through experience and the general concepts and aesthetics of Experience Design. The first in a two-part series, this course lays foundational principles focusing on the components of a live experience and how space, narrative and interaction affect the design from early conceptualization through implementation.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Process

TDXD 5500 (3) Experience Design Atelier 1: Design Evolution and Expression

Introduces students to various techniques for graphically representing design ideas using drawing and illustration techniques in order to augment and deepen the diverse skill sets of students in the class. The first in three-part sequence on graphic representation and expressive practices, students will learn how to work out design ideas through sketching, drawing, creating storyboards and collages.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5700 (3) Experience Design Atelier 2: Introduction to Design Graphics

Introduces students to advanced techniques for representing design ideas in graphic form including commonly used software applications (Sketchup, Vectorworks, AutoCAD), scale modeling, mechanical drawing and rendering. The second in a three-part class sequence on graphic representation and expressive practices, this atelier will offer a range of exercises tailored to the skill level of individual students.

Requisites: Requires a prerequisite course of TDXD 5500 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5805 (6) Professional Portfolio 1

Focuses on selecting, organizing and developing a plan for presenting material that will eventually culminate in the completion of a competitive professional portfolio, a vital tool for gaining employment in the Experience Design industry. The first of a two-part credited final project, students begin the process to prepare their professional portfolio under the guidance of faculty and industry professionals.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Dsgn: Documentation

TDXD 6105 (3) Collaboratory in Experience Design 2

Introduces students to professional models of working in the Experience Design industry. The second in a two-part class sequence, students work collaboratively on industry case studies focusing on entertainment, education and cultural destination genres with input from outside professionals in the field.

Requisites: Requires a prerequisite course of TDXD 5105 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Process

TDXD 6210 (3) Storytelling for XD

Explores multi-modal, expressive strategies for experimental storytelling and investigates the diverse languages of live experience. Students complete projects using varying modes of conveyance including physical and spatial action, filmic approaches, digital media and alternative methods. Students will discuss current trends in expressive methods and the nature of story.

Requisites: Restricted to Experience Design (TDXD) MFA students only.

TDXD 6500 (3) Experience Design Atelier 3: Packaging the Design Presentation

Investigates strategies for visually communication and "selling" design ideas in a compelling and well composed visual/aural presentation. The third in a three-part sequence on graphic representation and expressive practices, this class culminates in a final, comprehensive design project portfolio that follows current professional standards.

Requisites: Requires a prerequisite course of TDXD 5700 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 6805 (6) Professional Portfolio 2

Through editing materials collected in TDXD 5805, students will complete adaptable versions (hard copy, digital, web-based and presentations) of their professional portfolios. In this second of a two-part credited project, a committee comprised of faculty and industry professionals guide the completion of XD portfolios.

Requisites: Requires a prerequisite course of TDXD 5805 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Dsgn: Documentation

TDXD 6901 (3) XD Implementation and Engineering

Explores the realities and challenges of implementing themed entertainment design. Within the framework of project based case studies and a real work project, this course analyzes aspects of construction management, client management and approvals, scheduling, budgeting, value engineering, architecture and design.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

TDXD 6910 (6) The Experience Design Center

Offers Experience Design students an opportunity to engage in and complete projects posed by industry professionals or non-profit partners seeking assistance with experiential projects in a professional, practicing lab/studio setting. The XD Center, housed in a campus "maker-space," accepts design challenges and assignments that provide a realistic field experience for students.

Requisites: Restricted to Experience Design (TDXD) MFA students only.

THTR 5010 (3) Introduction to Performance Studies

Introduces students to the diverse genealogies of the field of performance studies by surveying foundational texts and key topics and by examining theoretical and methodological questions raised by particular performance practices. Provides students with vocabulary and references to continue to navigate the field of performance studies, as well as the many other academic fields that intersect with it.

Requisites: Restricted to graduate students only.

THTR 5011 (3) Seminar: Theory and Criticism

Studies theories and criticisms of drama and theatrical performances from Plato to post-modernism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5025 (3) Costume Patterning and Construction

Includes techniques for the patterning and construction of contemporary and period costumes. Hands-on format covers techniques, materials and equipment particular to theatrical production.

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 5031 (3) Russian Theatre

Studies Russian theatre history and the development of Russian drama from the 18th century to the present. Taught in translation.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5039 (3) Musical Theatre Repertory

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4039

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5041 (3) Women and Theatre of the 20th and 21st Centuries

Explores a body of 20th and 21st century dramatic literature central to the study of women and theatre as well as the study of 20th and 21st century cultural history from a cross-national and multiracial feminist perspective. Major playwrights, particularly women from Asia, Africa, and Europe, are read and discussed.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4041 and WGST 4041

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 5045 (3) Costume Crafts

Covers basic and advanced techniques in casting/molding, mask making, dyeing, painting, jewelry making, ventilating and wig style and millinery via a series of projects. Culminates in a final project encompassing all techniques. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Recommended: Prerequisite THTR 1115.

THTR 5049 (1-4) Special Topics in Theatre

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4049

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5051 (3) Special Topics in Theatre History

Detailed study of a particular topic in theatre history (e.g., an era, a style, a country, or an organization). Topic specified in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 5061 (3) On Stage Studies: Asian Performance

Study of live performance forms, theory, and literature throughout Asia: performance history, production styles, and social functions of performance.

Recommended: Prerequisite background in theatre, dance, or Asian studies.

Additional Information: Departmental Category: History/Dramaturgy/Directing

Departmental Category: Asia Content

THTR 5065 (3) Theatrical Tailoring

Explores classic and theatrical tailoring techniques and theories through the construction of classical men's wear: trousers, vest/waistcoats and coats. Student work with hand and machine sewing techniques, patterning skills and appropriate tailoring materials. Period of exploration will vary by semester. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite THTR 1115.

THTR 5071 (3) Advanced Directing

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercises. Instructor consent required.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 5085 (3) Theatre Management

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4085

Additional Information: Departmental Category: Theatre Design and Technology

THTR 5105 (3) Theatre Make-Up Design

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4105

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5113 (3) Comedy: A Performance Study

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4113

Additional Information: Departmental Category: Performance

THTR 5125 (3) Watercolor Illustration and Rendering Techniques

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4125

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theatre Design and Technology

THTR 5175 (3) Conceptualization

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4175

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6003 (1-3) Production Research and Practicum: Acting

Allows students to undertake an acting project, normally within the major theatre season, that requires detailed preparatory research, testing of ideas, and public presentation. Students work under faculty supervision and prepare a written report and evaluation of the research, rehearsal, and performance process.

Recommended: advanced studies in acting and advisor approval.

Additional Information: Departmental Category: Performance

THTR 6005 (1-3) Production Research and Practicum: Designing

Allows students to undertake a design project, normally within the theatre season, that requires detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision, and prepare a documented written report and evaluation of the research, design, and realization process, as well as fully rendered designs and/or plots. Projects may be in costumes, lights, or scenery.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 6007 (3) Colorado Shakespeare Festival Dramaturgy

Students work as production dramaturgs for the Colorado Shakespeare Festival, developing detailed textual, historical, and critical research for CSF productions, participating in education and outreach programs, and writing production-related articles for publication.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Shakespearean Production

THTR 6009 (1) Research Strategies and Techniques

Examines research methodologies appropriate to the performing arts, particularly theatre and dance. Projects are aimed at familiarizing graduate students with the library and other resources, and the development of thesis and dissertation prospectuses.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 6009

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6011 (3) On-Stage Studies: Global Ancient and Classical Theatre

Studies classical and neoclassical drama in performance, with particular attention to 20th century productions and the critical and scholarly responses to these productions.

Additional Information: Departmental Category: History/Dramaturgy/Directing

Departmental Category: Asia Content

THTR 6021 (3) On-Stage Studies: English Renaissance Drama

Studies Elizabethan and Jacobean dramatic texts as playscripts for performance, with particular attention to contemporary Shakespeare criticism and landmark Shakespeare productions over the last two centuries.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6031 (3) On-Stage Studies: American Theatre

Studies American drama in performance, with particular attention to critical and scholarly responses to landmark productions of American classics.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6041 (3) On-Stage Studies: Global Modern Theatre

Studies global theatre from 1600 to 1950, with particular attention paid to critical and scholarly responses to landmark productions of classics from the period.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6051 (1-3) Production Research and Practicum: Directing

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercise. Instructor consent required.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6071 (3) Seminar: Perspectives on Acting

Art of acting is examined through study of acting theories and practices developed during major periods of theatre history. Examines the variety of theories about acting that remain today.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6081 (3) Seminar in American Theatre: Lesbians and Gays

Studies the portrayal of lesbians and gays in mainstream American theatre during the 20th and 21st centuries, as well as the contributions of gay and lesbian theatre artists during the same period.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6091 (1-3) Production Research and Practicum: Dramaturgy

Students undertake a dramaturgical project, normally within the major season, requiring detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision and prepare a documented written report of their project.

Recommended: advanced course work in dramatic literature and advisor approval.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 6111 (3) Global Contemporary Theatre

Explores global theatre from the early 1960s to the present, with particular attention towards balancing the avant garde and popular theatre in recent world drama.

THTR 6849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6949 (1) Master's Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6959 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 7004 (6) Colorado Shakespeare Festival Summer Immersion

Immersive two-week summer intensive designed to provide an in-depth study of Shakespeare with the Colorado Shakespeare Festival (CSF). Students learn from and engage with CSF company members and faculty from English and Theatre and Dance departments in a small group, experiential setting. Students attend plays, rehearsals and lectures, and explore acting, directing and pedagogy.

Additional Information: Departmental Category: Shakespearean Production

THTR 8999 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

Applied Shakespeare - Graduate Certificate

Come immerse yourself in Shakespeare! Get to know the Bard and his plays as never before by participating in this unique, cross-disciplinary graduate certificate program that combines courses from the Department of Theatre & Dance and the Department of English.

Experience a vital mix of performance and scholarship by taking an online (or on-campus) three-credit graduate-level Shakespeare survey course and then visiting campus for a two-week summer intensive during the Colorado Shakespeare Festival (CSF) to learn from the nationally recognized CSF company members and CU faculty in small experiential groups.

The six-credit summer intensive includes acting, directing, stage combat, Elizabethan culture, Shakespeare in film, rehearsal visits, play attendance, classes on how to teach Shakespeare, and more. Self-directed reading and a final paper are the conclusion of the certificate requirements.

Extend your Shakespeare experience by applying the earned certificate core requirements to the upcoming Master's Degree in Applied Shakespeare.

Distance Education

Students can complete some requirements for this graduate certificate via distance education (online). For more information, visit CU Boulder Connect's Certificate Programs (<http://www.colorado.edu/connect/certificate-programs>) webpage.

Requirements

ENGL 5000	Introduction to Applied Shakespeare	3
THTR 7004	Colorado Shakespeare Festival Summer Immersion	6
Within two months of completing the two-week summer intensive, students must submit their final paper.		
Total Credit Hours		9

Dance - Master of Fine Arts (MFA)

The MFA program at CU is designed to accommodate a variety of students, ranging from the practicing professional to the recent BA or

BFA graduate. The MFA will develop students' creative, performance, and scholarly work and position them for teaching careers in higher education as well as a variety of other careers in the field of dance. The program provides a well-rounded education that develops concrete skills in performance and choreography, and instills an appreciation of the role that dance plays in history and human culture. Our core training includes classes in modern, ballet, African, jazz, Hip-Hop and Transnational Fusion dance.

Goals

- To encourage the clarification and individuation of each student's artistic voice.
- To prepare and empower students to fulfill their chosen career paths, both in their graduate studies and in the professional world.
- To investigate traditional and innovative approaches to movement invention, choreography and performance.
- To deepen somatic awareness and increase fluency in dance technique, including Ballet, Improvisation, Jazz, Modern, Hip-Hop and West African.
- To actively engage in dance research, with particular attention to discovering relationships between scholarship and creative work.
- To examine pedagogical goals and strategies from aesthetic, cultural and anatomical perspectives.
- To present choreography/creative work on a regular basis and perform in the creative work of faculty, student peers and guest artists working in a variety of aesthetic and technical styles.

Curriculum

The core MFA curriculum focuses on the development of the individual artistic voice in both performance and choreography. The presentation of new creative work is bolstered, augmented and enriched by the study of theory and cultural history.

MFA candidates are required to choose at least one secondary area of study designed to give variety and professional clout to the student's training. The university setting is particularly well suited to broad educational goals, given the wide variety of subjects available for involvement. Possible secondary areas of emphasis study are:

- Aerial Dance
- Cultural Studies
- Dance Criticism
- Disability Studies
- Film/Video/Music
- History
- Kinesiology
- Multi-media Forms
- Non-concert Forms
- Outreach/Community Engagement
- Performance Art
- Site Specific work
- Somatics - includes Alexander Technique, Body Mind Centering, GYROTONICS/GYROKINESIS®, Pilates
- Women & Gender Studies
- Writing/Poetry/Literature

Performance and Choreography

All MFA students are expected to present choreographic work each semester, either as part of course-related events or in other departmentally-produced events. It is expected that students will seek not only to refine their established artistic practices, but also assiduously to stretch themselves in the creative process into less familiar movement, choreographic, aesthetic and expressive modes. Evaluation of artistic output will be based on articulateness, sophistication, theatrical and conceptual completeness and on the extent to which a student has deeply sought change and discovery.

Students are urged to seek a variety of performance opportunities with fellow students, faculty and guest artists. Produced performances are presented at least three times each semester, and informal showings occur regularly during the year. Extensive work with off-campus groups is normally extremely difficult to schedule.

Students are encouraged to think outside of the box both in terms of course choices and creative and scholarly activities. A large portion of the required credits are electives, allowing for a great deal of freedom and individualization of study. It is critical that a student work closely with his/her advisor in selecting electives in the dance curriculum, courses outside of the department, and creating independent studies and internships that will support the student's goals. The faculty encourages students to search far and wide through the university's catalog (<http://www.colorado.edu/catalog/2016-17>) offerings to discover courses and areas of study that are particularly suited to their individual interests.

Modified MFA Program for Professionals

Those students entering our program with extensive professional backgrounds including teaching, choreography and/or performance may be able to devise a modified degree plan. For such students, an interview with the Director of Dance and the Dance Graduate Director during the application/audition process is necessary. The interview will help determine if there is a good match between the student's goals and our MFA program. The goal of the modified program for professionals is to provide flexibility in the pursuit of individual goals and the filling of specific educational gaps.

The number of required credits (minimum 30) and semesters will be determined based on the individual's professional and life experience. To maximize flexibility and maintain rigor, the graduate faculty advisor and the student will collaborate to create the best course of study to round out the returning professional's educational experience and develop new areas of research and creative work.

Core Course Waivers

An MFA student who wishes to have a core course waived must present a written proposal to the faculty that includes:

1. The title of the course to be waived, credit hours and instructor (if known)
2. What course(s) the student would take in its place, the credit hours, and the instructor (if known)
3. A brief narrative as to why the student does not feel it is appropriate for him/her to take the core course. If the student has life experience comparable to the course content or has taken elsewhere what he/she believes to be a comparable course, documentation in the form of syllabus or course materials must be submitted. If the student has a medical condition that precludes taking a technique course,

a physician's documentation or other specific description of the condition must be submitted.

This proposal should be developed under the guidance of the student's advisor, and then submitted to the faculty at large. The proposal will be discussed at the next opportune faculty meeting, and approval or disapproval will be granted or revision suggested. Waiving of requirements does not necessarily mean a reduction of the total credit hours required.

For detailed information, visit the department's MFA in Dance (<http://www.colorado.edu/theatredance/admissions/degrees/mfa-dance>) webpage to download the *MFA Handbook*.

Requirements

Assessment Survey: Anatomy/History/Music/Production

Entering students will be sent a list of questions about their anatomy, dance history, music, and production training, both academic and experiential. Students will be asked to provide written answers and send the survey to the Graduate Assistant prior to arriving on campus. After the answers have been reviewed, secondary deficiencies in these curricular areas will be determined. Procedures for making up any deficiencies will be decided through discussion with the appropriate instructor. Deficiencies are determined early in fall semester so remedial courses or independent studies can be added to the degree plan if necessary. It is possible that an entire course will not be recommended but rather an individual will be asked to work with a faculty member in a specific area. Any deficiencies will be noted in your file that is in the Graduate Assistant's office. It will also be noted in your file when the deficiency is removed. Courses taken to make up deficiencies may not be counted towards the degree. The survey is also used to determine if strengths in certain areas warrant waiving specific core courses.

Required Courses and Semester Credit Hours

The three-year program requires a minimum of 60 credit hours, at least 30 of which must be taken in Dance at the 5000 level or above. The program focuses on performance/choreography and secondary areas of specialization. Grades lower than a B- cannot be applied towards graduation; a 3.0 GPA is needed to graduate.

Required Courses

DNCE 5001	Graduate Technique (to be taken four times) ¹	8
DNCE XXX1	Additional Technique Classes ¹	6
DNCE 5012	Concert Production ²	1
DNCE 5014	Graduate Rhythmic Skills	2
	or DNCE 5024 Graduate Musical Resources	
DNCE 5017	Dancing Histories: Sex, Gender and Race in U.S. Concert Dance	3
DNCE 5053	Advanced Dance Composition ²	3
DNCE 5056	Graduate Teaching Seminar	2
DNCE 5601	Alexander Technique for Graduate Students	2
DNCE 6009	Research Strategies and Techniques	1
DNCE 6047	Seminar: Dance (taken twice with different instructors)	6
DNCE 6073	Choreography (taken twice with different instructors) ²	6
DNCE 6969	The Graduate Project	4-6
<i>Total Required Coursework</i>		44
<i>Electives</i>		14-16

Total Hours for MFA Degree	60
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- ¹ Minimum dance technique: 14 credit hours.
- ² Students must complete Advanced Composition, both Choreography courses, and Concert Production prior to concert semester.

Secondary Emphasis Guidelines

MFA candidates are required to choose at least one secondary area of study designed to give variety and professional clout to the student's training. Through collaboration with the student's academic advisor, the student's secondary emphasis should be selected no later than the second semester of study. The program is designed to be responsive to individual areas of interest and to ensure effective preparation for careers in academics and the professional arena. The university setting is particularly well-suited to these broad educational goals, given the wide variety of subjects available for involvement. See MFA in Dance (<http://www.colorado.edu/theatredance/admissions/degrees/mfa-dance>) for possible secondary areas of study.

Students may choose an emphasis that can be fulfilled by courses taken within the department and/or in other campus departments. We encourage students to search far and wide through CU's course catalog (<http://www.colorado.edu/catalog/2016-17>) to discover courses and areas of study that are particularly suited to their individual interests and career goals.

Students may also choose to complete a graduate certificate offered by another department as their secondary emphasis. The most common certificates earned by MFA students are:

- Women & Gender Studies Certificate – Women & Gender Studies Program
- Ethnic Studies Certificate – Department of Ethnic Studies
- TAM Certificate Technology Arts & Media - Alliance for Technology, Learning, & Society (ATLAS) (<http://www.colorado.edu/atoz/show/u40b4c44c55fa3edc67b5b4ca677584d0/#unit1>)
- Critical Theory Certificate – Department of Germanic & Slavic Languages & Literatures

Students also have two options for secondary emphases that involve off campus private lessons taken at special training schools/centers and subject to their requirements. The Somatic and Aerial Emphases are sponsored by the department, but require students to take some of the private lessons and training that occur at local specialty centers.

Aerial Dance Emphasis

Courses in the Aerial Dance Emphasis are offered for those students who have a serious interest in aerial dance and its application to dance training, performance and/or teacher training. Students can work towards the completion of the Professional Training Program at Frequent Flyers (<http://www.frequentflyers.org>)® while simultaneously pursuing their MFA degree. The Professional Training Program must be successfully completed before the MFA degree will be awarded. Before a student is eligible to begin work in the Aerial Dance Emphasis, he/she must be officially accepted by Frequent Flyers® Professional Training Program (located off-campus in Boulder) and have been approved by faculty member Nada Diachenko to follow the Aerial Dance Emphasis.

Somatic Emphasis

The Somatic Emphasis is offered by the Dance Division for those students who have a serious interest in somatic studies and their application to dance training, performance, choreography and dance medicine/injury prevention. Students can focus in the Alexander

Technique Intensive Study program (ATIS) and/or Body Mind Centering (BMC), work towards certification in GYROTONIC®/GYROKINESIS®, or work towards certification at the Pilates Center (<http://www.thepilatescenter.com>) in Boulder while simultaneously pursuing their MFA degree. Students may also combine Alexander and BMC for their intensive study. The ATIS and BMC intensive studies do not involve a certification but they do provide an in-depth theoretical and practical study. They also provide a solid foundation for the possibility of entering an Alexander Teacher Training program (a 3 year program) or a Body Mind Centering training (a 4 year training program) elsewhere.

Before a student is eligible to pursue certification in GYROTONIC®/GYROKINESIS®, Pilates, ATIC or BMC, they must be approved and accepted by the training course Directors of those programs, as well as the Director of the Somatic/Aerial Emphasis, Nada Diachenko. The certification program or intensive studies must be successfully completed before the MFA degree will be awarded.

MFA Project

The culmination of graduate study is a choreographic/creative project accompanied by a paper. In the second year of the degree program, a written proposal for the creative project must be presented and approved. Upon its completion, an oral defense of the project and paper is required. On rare occasions students undertake a scholarly thesis instead of artistic project and paper.

Graduate Comprehensive Portfolio

Prior to graduation, MFA candidates submit a collection of scholarly, pedagogical and creative work. The portfolio is intended to document and synthesize the graduate's reasoned personal philosophies, choreography and academic investigations. It includes creative and pedagogical statements, scholarly essays, a CV and digital documentation of teaching, performance and choreography.

Experience Design - Master of Fine Arts (MFA)

This unique, studio-centric MFA in Experience Design (XD) admits a cohort of eight to twelve talented students from varied backgrounds, including all areas of design, art, architecture, and engineering every other year. Students in the XD program form a studio collective to complete an array of XD projects under the direct guidance of CU faculty and professionals in the field, many who provide project content. As a result of this industry involvement, XD graduates are prepared to enter the field of experiential design.

In addition to preparing students for employment, the MFA in XD exposes students to new ways of seeing the reality around them, new ways of creating, resolving problems, expressing ideas and telling stories. Essentially, the MFA in XD is a course of study in using a new language.

The program also features a "design center" where students and faculty accept real-time XD problems posed by outside entities (including contracted projects with commercial firms) and solve them via a collaborative, studio approach. The work of this center provides a service to various communities and is a practical extension of learning for students.

While the MFA in XD advances a collaborative studio environment where teamwork is held in high regard, we consider it a mission of the program to foster the individual talents, visions, and interests of each student in the program. The program will make every effort to provide a vessel

where individual students may gestate their own concepts, allowing them room to explore, test, and innovate with the support of studio spaces, technology, cohort students, faculty, and industry professionals.

Connections to Industry

Some of the program's professional advisors, endorsers and participants include: Jim Doyle of WET Design (<https://www.wetdesign.com/default.html>), makers of the famed Bellagio Fountains in Las Vegas; Dave Cooperstein and Al Cross of PGAV Destinations (<http://pgavdestinations.com>), designers of Sea World and the NASA Space Museum, Electrosonic (<http://www.electrosonic.com>); makers of the live video projection technology for Disney's Magic Kingdom Castle; Adam Bezark (<http://bezark.com>), Phil Hettema (<http://www.thehettemagroup.com>), and Steve Ryan, commercial producers of live experiences with credits at Disney, Universal and Landmark Entertainment; Drew Campbell, Creative Director at International Resorts in Singapore; Baam Productions (<http://www.baamproductions.com>); Nassal (<http://www.nassal.com>); Super 78 (<http://www.super78.com>); Peter Exline, Architect and Themed Attraction Designer; and many others.

Course	Title	Credit Hours
Year One		
Fall Semester		
TDXD 5005	Design Technology 1: Visual Technology	3
TDXD 5105	Collaborator in Experience Design 1	3
TDXD 5500	Experience Design Atelier 1: Design Evolution and Expression	3
THTR 5049	Special Topics in Theatre (Improvistic)	3
	Credit Hours	12
Spring Semester		
TDXD 5700	Experience Design Atelier 2: Introduction to Design Graphics	3
TDXD 6105	Collaboratory in Experience Design 2	3
TDXD 6210	Storytelling for XD	3
TDXD TBD: Design Theory		3
	Credit Hours	12
Summer		
TDXD 5805	Professional Portfolio 1	6

TDXD 6910	The Experience Design Center	6
	Credit Hours	12
Year Two		
Fall Semester		
TDXD 6500	Experience Design Atelier 3: Packaging the Design Presentation	3
TDXD 6805	Professional Portfolio 2	6
TDXD 6901	XD Implemental and Engineering	3
Electives		6
	Credit Hours	18
	Total Credit Hours	54

Theatre - Doctor of Philosophy (PhD)

The PhD program in theatre and performance studies is primarily designed for those who intend to be scholars working in an academic environment.

At CU Boulder, we believe that scholarship in the field of theatre should be premised on the fact that theatre is a performing art. This does not mean that the standards for theatre scholarship are any less rigorous than those in other disciplines, but it does mean that the theatre scholar must be prepared to use research methodologies and perspectives capable of illuminating drama in performance. To this end, the education of a theatre scholar should entail ongoing experiences in theatre productions.

The program is designed to be completed in four years for students entering with a master's degree. Conventionally, the first and second years focus on course work, the third year is spent preparing for and taking the comprehensive examination, and the fourth year is spent writing and defending the dissertation. While it is possible for a student entering the PhD program with a master's degree to finish in three years, it is not uncommon for students to take five years to finish.

Requirements

Program Overview

To complete the program, students must:

1. demonstrate proficiency in academic course work
2. demonstrate reading competency in at least one foreign language equivalent to the completion of a second-semester college-level course
3. pass a comprehensive exam
4. prepare and successfully defend a dissertation

Doctoral students in theatre and performance studies complete 30 credit hours of course work beyond the master's degree at the 5000 level or above. When approved by the student's advisor, credit hours from other departments on campus may count, provided the course is taught by a member of the graduate faculty in that department. In addition to the 30

credit hours of course work, 30 dissertation credit hours (THTR 8999) are required.

Required Courses

The PhD program is based upon a core of required courses which emphasize the interrelatedness of theory, history and practice.

The "on-stage studies" courses place dramatic texts and performance traditions in the context of contemporary performance. They are designed to pose questions like, "How might this play work on the stage today? What problems does it present the contemporary director/dramaturg? In what ways is it socially relevant? How have directors like Jonathan Miller, Ariane Mnouchkine, Peter Stein, Ivo van Hove, etc., staged them?" In a nutshell, the aim of the on-stage studies curriculum is to teach students to think as dramaturgs and directors, as well as scholars.

Required Courses and Semester Credit Hours

Required Courses

THTR 5010	Introduction to Performance Studies	3
THTR 5011	Seminar: Theory and Criticism	3
THTR 6009	Research Strategies and Techniques	1
Select three of the following:		9
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: English Renaissance Drama	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	Global Contemporary Theatre	

Electives

Additional courses to meet the 30-credit minimum.	14
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Dissertation	30
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THTR 8999	Doctoral Dissertation	
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Total Credit Hours	60
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Elective Course Work

PhD students are encouraged to take elective courses offered by theatre graduate faculty members in their area of research (e.g., performing voices of women, performance studies, directing, theatre for social change), as well as graduate dance courses (e.g., graduate dance technique, advanced dance composition). When approved by the student's advisor, PhD students are encouraged to take courses in other departments, especially as they relate to the anticipated dissertation topic. Electives are determined by students and their advisors, consistent with Graduate School and departmental requirements.

Graduate Independent Study

This may not be used as an avenue for taking undergraduate courses in the major department or replicating existing graduate classes. Although there is no limit to the number of independent study credit hours a doctoral student may take, they should be held to a minimum. Independent study contract forms are available from the graduate program assistant and on the department website (<http://www.colorado.edu/theatredance/node/1026/attachment>).

Production Research and Practicum Courses

These courses in areas such as acting, directing, design, applied theatre, dramaturgy and production management/producer work may be taken for 1–3 credit hours. A limit of 3 credit hours in each category may

apply toward the degree. All courses are supervised by members of the graduate faculty; regular meetings with the instructor of record are required.

Guidelines for flexible credit hours are:

- one credit hour for successfully completing the project
- two credit hours for completing the project and submitting a written record of it (e.g., an actor's journal, a director's regiebuch)
- three credit hours for doing all of the above and writing a pertinent 15- to 25-page research paper, with the topic to be determined in consultation with the advisor

Language Requirement

Reading competency in a foreign language is an important skill for a scholar. It allows the student to consider a dissertation topic beyond the limits of English-speaking theatre, thereby significantly broadening his or her research and publishing possibilities. Doctoral students are required to demonstrate proficiency in a foreign language equivalent to the completion of a second-semester college-level course before taking the comprehensive exam. This requirement may be fulfilled by course work taken within five years previous to the exam or by testing.

Dissertation

The PhD program culminates in the dissertation, a research document that makes a significant and original contribution to the field of theatre studies.

Theatre - Master of Arts (MA)

At CU Boulder, we believe that scholarship in the field of theatre should be premised on the fact that theatre is a performing art. This does not mean that the standards for theatre scholarship are any less rigorous than those in other disciplines, but it does mean that the theatre scholar must be prepared to use research methodologies and perspectives capable of illuminating performance. To this end, the education of a theatre scholar should entail ongoing experiences in theatre productions.

Please note that successful completion of the MA program does not entail acceptance into the PhD program.

Dual Degree Program

MBA/MA in Theatre

The Leeds School of Business, in conjunction with the Department of Theatre & Dance, offers students the ability to earn an MBA and an MA in theatre through a three-year dual degree program. Students in the MBA/MA dual degree program pursue careers in a wide variety of fields and jobs in the world of the performing arts. Types of organizations include theatre companies, dance companies, opera companies, symphonies, arts councils, performing arts complexes, civic auditoriums and arts presenters.

Admission for MBA/MA

Students may apply either to the Department of Theatre & Dance for the MA degree program or to the Leeds School of Business for the MBA degree program. Having been accepted, they will apply to the other degree program during their first semester.

Students may apply for both programs simultaneously, in which case:

1. Students must apply to each program separately

2. Students must meet the admissions standards for each program separately

Note: Residents of U.S. Western states, including Alaska and Hawaii, may be eligible for in-state tuition for this dual degree program, provided the student applies and is accepted to both programs in the same admissions cycle. For more information, visit the Western Regional Graduate Program (<http://wiche.edu/wrgp>) webpage.

Course of Study

Students in the MBA/MA in theatre spend the first year of their dual-degree program exclusively in either the Leeds School of Business or the Department of Theatre & Dance. This is the case even if the student was admitted to both programs simultaneously. In the second year, courses are taken exclusively in the other program. The third year offers students the opportunity to take both the MBA and theatre/dance elective courses.

Credit for Courses

Dual degree students are required to complete 43 credit hours of MBA course work and 24 credit hours of theatre/dance course work. A minimum of 67 approved credit hours must be completed to earn both degrees. See the "Requirements" tab for details.

Requirements

Required Courses

After any undergraduate deficiencies have been removed, students must earn 30 credit hours, at least 16 of which must be in THTR courses at the 5000 level or above. At least 24 of the 30 hours must be at the 5000 level or above.

A student may not receive graduate credit toward a degree for more than 15 hours per semester, fall or spring. A student may not receive graduate credit toward a degree for more than 6 credit hours in one five-week summer term or more than 10 credit hours in one summer session.

Undergraduate major courses taken to make up deficiencies may not be counted in the minimum number required for the degree; however, grades for any such courses taken will be included in the GPA. Students taking graduate or undergraduate coursework not applying toward their degree may do so for a letter grade, no credit, or pass/fail. If taken for a letter grade, the course will be calculated in the student's graduate GPA. If taken pass/fail, a failing grade will be calculated into the GPA. Note: courses taken for no credit are not covered by tuition remission.

Students must declare either the thesis or non-thesis option by the start of their third semester, and may apply 4–6 thesis credit hours toward the 30-credit-hour requirement.

Elective Course Work

MA students are encouraged to take elective courses offered by theatre graduate faculty members in their area of research (e.g., performing voices of women, performance studies, directing, theatre for social change), as well as graduate dance courses (e.g., graduate dance technique, advanced dance composition). When approved by the student's advisor, MA students are encouraged to take courses in other departments, especially as they relate to the anticipated thesis topic. Electives are determined by students and their advisors, consistent with Graduate School and departmental requirements.

Graduate Independent Study

This may not be used as an avenue for taking undergraduate courses in the major department or replicating existing graduate classes. Independent study course work cannot exceed 25 percent of the course

work required for the master's degree. Independent study contract forms are available from the graduate program assistant and on the department website (<http://www.colorado.edu/theatredance/node/1026/attachment>).

Production Research and Practicum Courses

These courses in areas such as acting, directing, design, applied theatre, dramaturgy and production management/producer work may be taken for 1-3 credits. A limit of 3 credits in each category may apply toward the degree. All courses are supervised by members of the graduate faculty; regular meetings with the instructor of record are required. Practicum contract forms are available from the Graduate Program Assistant and on the department website.

Guidelines for flexible credit are:

- one credit hour for successfully completing the project
- two credit hours for completing the project and submitting a written record of it (e.g., an actor's journal, a director's regiebuch)
- three credits hours for doing all of the above and writing a pertinent 15- to 25-page research paper, with the topic to be determined in consultation with the advisor

Degree Plans

Plan I: Thesis Option

This plan prepares students to pursue a PhD degree at CU or elsewhere. Students must write a substantial research document demonstrating mature critical thought based on independent study and investigation (Graduate School Plan I). Students must demonstrate proficiency in three areas: academic course work, the thesis and the final exam (oral).

Required Courses and Semester Credit Hours

Required Courses

THTR 5010	Introduction to Performance Studies	3
THTR 5011	Seminar: Theory and Criticism	3
THTR 6009	Research Strategies and Techniques	1
Select two of the following:		6
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: English Renaissance Drama	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	Global Contemporary Theatre	

Thesis Work

THTR 6849	Independent Study (prepare thesis prospectus)	3
THTR 6959	Master's Thesis (take in fourth semester for thesis completion) ²	4

Electives ¹		10
Total Credit Hours		30

¹ Students may take 4–6 thesis hours. The number of electives is adjusted accordingly.

² All course work applying towards the degree must be taught by members of the graduate faculty holding current graduate faculty appointments. Theatre courses below the 5000 level cannot be counted toward the degree. Courses in which grades below B- are received are not accepted for master's degree programs.

Plan II: Non-Thesis Option

Students who do not plan to pursue a PhD can elect the non-thesis option, which requires a three-hour written exam covering graduate coursework and a two hour oral exam. (Graduate School Plan II). To complete the non-thesis plan, students must demonstrate proficiency in two areas: academic coursework and the final exam (written and oral).

This option requires a three-hour written exam covering graduate course work (Graduate School Plan II). Students who do not plan to pursue a PhD can elect the non-thesis track. To complete the non-thesis track of the MA program, students must demonstrate proficiency in two areas: academic course work and the final exam (written and oral).

Required Courses and Semester Credit Hours**Required Courses**

THTR 5010	Introduction to Performance Studies	3
THTR 5011	Seminar: Theory and Criticism	3
THTR 6009	Research Strategies and Techniques	1
Select two of the following:		6
THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: English Renaissance Drama	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	Global Contemporary Theatre	
Electives ¹		17
Total Credit Hours		30

¹ All course work applying towards the degree must be taught by members of the graduate faculty holding current graduate faculty appointments. Theatre courses below the 5000 level cannot be counted toward the degree. Courses in which grades below B- are received are not accepted for master's degree programs.

MBA/MA in Theatre Course Work

The MBA/MA is a dual degree program, and its curriculum is best conceived that way. A minimum of 67 approved credit hours must be completed to earn both degrees. Dual degree students will be required to complete 43 hours of MBA course work and 24 hours of Theatre/Dance course work. The dual degree agreement allows students to count 18 credit hours of courses towards both degrees.

Course work for the MBA portion of the Dual MBA/MA in Theatre (p. 1135) can be found on the Leeds School of Business catalog page. The MBA requires 55 credit hours. Twelve credit hours from the student's course work for the MA will count toward the MBA.

The MA in theatre requires 30 credit hours, 24 of which must be at the 5000 level or above. Six credit hours from the student's work in the Leeds School of Business will count toward the MA in theatre. Students are encouraged to explore classes outside the Department of Theatre & Dance for some of their electives.

Required Courses

THTR 6009	Research Strategies and Techniques	1
THTR 5011	Seminar: Theory and Criticism	3
or THTR 5010	Introduction to Performance Studies	
or DNCE 6047	Seminar: Dance	
Select two of the following:		6

THTR 6011	On-Stage Studies: Global Ancient and Classical Theatre	
THTR 6021	On-Stage Studies: English Renaissance Drama	
THTR 6031	On-Stage Studies: American Theatre	
THTR 6041	On-Stage Studies: Global Modern Theatre	
THTR 6111	Global Contemporary Theatre	
THTR 5085	Theatre Management	3
or MUSC 5968	Entrepreneurial Ventures in the Arts	
or DNCE 6056	Professional Development	
THTR 4061	Directing (depending on experience)	3
or THTR 6071	Seminar: Perspectives on Acting	
Electives in THTR or DNCE. ²		8
Six hours of course work taken in the Leeds School of Business.		6
Total Credit Hours		30

¹ All course work applying towards the degree must be taught by members of the graduate faculty holding current graduate faculty appointments. Theatre courses below the 5000 level cannot be counted toward the degree. Courses in which grades below B are received are not accepted for master's degree programs.

² Students who elect the thesis plan will take 4–6 master's thesis credit hours. The number of electives will be adjusted accordingly.

Women and Gender Studies

The Department of Women and Gender Studies offers a graduate certificate program in women and gender studies, which offers CU graduate students a cutting-edge, interdisciplinary education in gender and sexuality studies. It provides a thorough grounding in feminist and/or queer theory and feminist methodology, as well as the opportunity to explore diverse special topics in gender and sexuality studies. The certificate is designed to help graduate students from a wide range of different CU departments and programs navigate the conceptual gap between discipline-specific studies and interdisciplinary work in gender and sexuality studies. On a practical level, the certificate has proven especially useful to graduate students seeking to demonstrate their expertise in gender and sexuality studies to prospective employers in academia, government and the private sector.

Course code for this program is WGST.

Certificate

- Women and Gender Studies - Graduate Certificate (p. 1119)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bayard de Volo, Lorraine M. (https://experts.colorado.edu/display/fisid_143611)

Associate Professor; PhD, University of Michigan Ann Arbor

Bowen, Scarlet (https://experts.colorado.edu/display/fisid_130905)
Lecturer; PhD, University of Texas at Austin

Buffington, Robert Marshall (https://experts.colorado.edu/display/fisid_144975)

Professor; PhD, University of Arizona

Bullington, Sam N (https://experts.colorado.edu/display/fisid_152528)
Instructor

David, Emmanuel A. (https://experts.colorado.edu/display/fisid_146542)
Assistant Professor; PhD, University of Colorado Boulder

Jacobs, Janet L (https://experts.colorado.edu/display/fisid_100744)
Professor; PhD, University of Colorado Boulder

Jaggar, Alison M (https://experts.colorado.edu/display/fisid_100454)
Professor; PhD, SUNY at Buffalo

Misri, Deepti (https://experts.colorado.edu/display/fisid_146428)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

Montoya Kirk, Celeste Marie (https://experts.colorado.edu/display/fisid_144862)
Associate Professor; PhD, Washington University

Pois, Anne Marie
Professor Emeritus

Courses

WGST 5000 (3) Advanced Topics in Gender and Sexuality Studies

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4000

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

WGST 5400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4400 and LGBT 4400 and LGBT 5400

Grading Basis: Letter Grade

Additional Information: Departmental Category: LGBT Studies

WGST 6090 (3) Feminist Theories

Explores how feminist theorists have understood gender and how it interrelates to our understandings of race, ethnicity, sexuality, embodiment and knowledge. Meets the requirements for the WGST certificate.

Requisites: Restricted to graduate students only.

WGST 6190 (3) Feminist Methodology

Explores feminist methodology across a range of disciplines. Themes include experience and interpretation, the social position of the researcher, language and argument structure, knowledge and power, bias and objectivity, and the ethics and politics of research. Meets the requirements for the WGST certificate.

Requisites: Restricted to graduate students only.

WGST 6290 (3) Special Topics in Gender and Sexuality Studies

Offers interdisciplinary feminist perspectives on different special topics such as gender and war, gender and globalization, women's social movements, gender and citizenship, gender and collective memory, and cultural representations of gender and sexuality. Meets the requirements for the WGST certificate.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

WGST 6796 (3) Queer Theories

Explores key concepts and debates in the field of queer theory with an interdisciplinary focus on crosscutting issues (aesthetic, cultural, legal, medical, political and social) that shape queer subjectivities, practices and relations.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

WGST 6840 (1-3) Independent Study

Provides course credit for a directed research project or reading program in women and gender studies, supervised by a WGST faculty member and approved by the WGST graduate director. Requires an independent study approval agreement form completed by the student and signed by the faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Women and Gender Studies - Graduate Certificate

The graduate certificate in women and gender studies is designed to complement a CU graduate disciplinary degree program—providing graduate students the opportunity to engage a variety of scholarly and methodological approaches to the study of gender and sexuality.

Students wishing to take part in the women and gender studies certificate program must be currently enrolled in a graduate disciplinary degree or professional degree program at CU Boulder. Students are encouraged to apply for the graduate certificate early in their course of graduate studies; students enrolled in the program will get priority if placed on a waitlist for a graduate-level women and gender studies course.

For more details including application instructions, visit the graduate certificate (<http://www.colorado.edu/wgst/graduates>) webpage, or email wgst@colorado.edu.

Requirements

Students must complete 9 credit hours of course work in women and gender studies and one additional course equaling 3 credit hours to be approved by the women and gender studies graduate advisor, for a total of 12 credit hours.

The minimum acceptable grade for courses submitted for the graduate certificate is a B. Minimum GPA for all courses submitted for the graduate certificate is a cumulative 3.5.

Required Courses and Semester Credit Hours

Required Courses

At least three of the following four courses:

WGST 6090 Feminist Theories

WGST 6190	Feminist Methodology	
WGST 6796	Queer Theories	
WGST 6290	Special Topics in Gender and Sexuality Studies	
Electives		
One additional 3-credit course approved by the women and gender studies graduate advisor. This course should focus on issues related to women, gender and/or sexuality; take an interdisciplinary approach; and ideally be taken either outside of the student's home department or as an additional course in women and gender studies.		3
Total Credit Hours		12

None of the three required women and gender studies courses may be taken as independent study.

Independent study courses taken with faculty not affiliated with the Department of Women and Gender Studies will not count for the graduate certificate. Independent study courses taken with department faculty members may count only in exceptional circumstances as determined by the graduate committee.

For more details, including application instructions, visit the WGST Graduate Certificate (<http://www.colorado.edu/wgst/graduates>) webpage or email wgst@colorado.edu.

Business

The new innovation economy requires—and rewards—richer knowledge, sharper skills and a global mindset. Ultimately, the edge belongs to those who are principled leaders who bring inspiration and purpose to their work and in this way drive value for society.

Within this climate, the Leeds School of Business offers an innovative agenda designed to leverage our unique assets: the intellectual capital of Leeds faculty, our innovative and best-in-class curriculum, our focus on the "whole student" experience, our strong network of alumni and industry partners and our firm commitment to student support.

Accredited by the Association to Advance Collegiate Schools of Business (AACSB-International), Leeds awards four types of degrees: Bachelor of Science (BS), Master of Science (MS), Master of Business Administration (MBA) and Doctor of Philosophy (PhD). Students can specialize in accounting, finance, management and entrepreneurship and marketing. Leeds further offers certificates in a variety of areas to provide opportunities for students to explore additional areas of interest and distinction.

World-class faculty provide the foundation for breakthrough thinking—creating knowledge from research, disseminating knowledge through teaching and applying knowledge in collaboration with the business community. Faculty discoveries are frequently published in prestigious academic journals and discussed in media outlets such as the *Wall St. Journal*, the *New York Times*, CNBC and more. The cutting-edge research we produce enhances the school's reputation for innovation.

From orientation to graduation, Leeds faculty and staff guide students to discover and optimize their potential. Through an array of targeted services, students create an individualized journey that maximizes the impact of their experience and leads to future opportunities. Ethics and social responsibility are hallmarks of a Leeds education, and the school's commitment to professional development is unrivaled.

Leeds alumni and industry partners collaborate to offer a meaningful level of engagement with students and faculty. Alumni provide the

support and resources that ensure graduates are poised for maximum impact. Corporate partners infuse relevance to Leeds' curriculum innovation, supporting new programs and providing the school access to professional talent. Both communities are the backbone of one of the largest mentoring programs in the world.

Leeds joins the University of Colorado and the Boulder community to generate extraordinary opportunities for students. Cross-campus collaborations with fields like engineering and science link Leeds faculty and students with more resources to put innovation into action. Our location in Boulder provides inspiration with its physical beauty as well as the intellectual energy of a thriving start-up community and high concentrations of advanced technology and socially responsible industries.

Together, these assets make Leeds uniquely qualified to deliver on our mission of educating principled, innovative leaders who drive value.

Graduation Recognition Ceremony

Every December and May, the Office of the Dean and the Leeds Business Student Government sponsor a recognition ceremony honoring the graduating class, in addition to the university-wide commencement. Graduates and their families are invited to attend.

Facilities & Research

The Leeds School of Business houses resources for the specific needs of business students. The facilities include:

- the Burrigge Center for Securities Analysis and Valuation
- the Business Research Division
- Career Development
- the Center for Education on Social Responsibility
- the Center for Research on Consumer Financial Decision Making
- the MBA Business Center
- the Office of Diversity Affairs
- the Real Estate Center
- the Robert H. and Beverly A. Deming Center for Entrepreneurship
- smart classrooms
- student lounges
- Undergraduate Student Services
- William M. White Business Library and Information Commons

The William M. White Business Library and Information Commons

The White Business Library (<http://www.colorado.edu/libraries/libraries/william-m-white-business-library>) and Information Commons provide students with a wealth of information pertaining to the business world. Students have access to the business and other libraries via the university libraries online catalog. Many databases are accessible through the wireless network and off campus. These databases, both CD- and web-based, contain a myriad of full-text magazines and journals; business periodical indexes; corporate annual, 10-K and proxy reports of all the public companies in the United States; short profiles of both American and international companies; demographic and business statistics; industry and market information; and investment reports written by Wall Street analysts. Over 50 computers provide access to the databases and the internet, and technology-outfitted team rooms are available for group study. Knowledgeable librarians are always available to help navigate the search for information. The Information Commons is

open 24 hours, seven days per week and contains 30 of the 50 computers with a full suite of software. These are accessible to students, faculty and staff of the university. In addition, Leeds has 25 technology equipped team rooms. These rooms support group study and project work, and are available for reservation through University of Colorado Scheduling (<https://vems1.colorado.edu>).

The White Business Library is part of the University of Colorado library system, which includes more than two million volumes, more than five million microforms, and more than 24,000 periodicals and serials. The system is also a full depository for United States government, international and state documents.

All classrooms in the Leeds School of Business are equipped up to campus "smart" classroom technology standards. Technologies in a typical Leeds classroom include: a desktop computer loaded with Microsoft Office Suite applications, video projection system, ceiling speakers for audio, DVD/VCR, iClicker base station, campus cable and both wired and wireless Internet connections. All classrooms have the flexibility to support a personal laptop with connectivity in place to integrate with the video projection and sound system.

Business Research Division

Established in 1915, the Business Research Division is one of the earliest organized state service-oriented bureaus in the country.

The Business Research Division conducts business, economic and market research that contributes to the efficient use of Colorado's resources and increases interest in and awareness of the Leeds School of Business. It also is the umbrella organization for the Rocky Mountain Trade Adjustment Assistance (TAA) Center (RMTAAC). Through its annual Colorado Business Economic Outlook Forum, held in December, the division has established a base of knowledge that adds value to its work in other areas. In addition to providing businesses, government and nonprofits with information to help them make better-informed business and policy decisions, the division specializes in economic and fiscal analysis, market research and custom research projects. It also prepares a Colorado leading economic indicator series, the *Leeds Business Confidence Index*. Research results are distributed through presentations and reports; a quarterly newsletter, the *Colorado Business Review*; and the division's website.

Funding for center activities comes from the Leeds School of Business, the university, state agencies, the federal government, state and local business firms and from the sale of research products and services.

RMTAAC is one of 11 centers across the nation funded by the U.S. Department of Commerce to manage the Trade Adjustment Assistance for Firms Program, which helps import-impacted U.S. firms develop and implement business recovery strategies to strengthen their competitiveness in the global marketplace. The TAA for Firms Program is a cost-sharing federal grant program that pays a portion of professional consultant expenses or industry-specific expert services for projects that improve a firm's competitiveness, thereby increasing sales and creating U.S. jobs. Benefits of the program include up to \$75,000 in grant funds and 50/50 cost sharing for strategic projects.

Academic Centers

In addition to the Business Research Division, the school has five centers linking academic programs and the business community—the endowed Robert H. and Beverly A. Deming Center for Entrepreneurship, the Center for Real Estate, the Burrige Center for Securities and Valuation, the

Center for Education on Social Responsibility (CESR) and the Center for Business Integration.

The Robert H. and Beverly A. Deming Center for Entrepreneurship

As part of the Leeds School of Business, the Deming Center for Entrepreneurship's mission is to inspire and empower students, community, alumni, faculty and staff through entrepreneurship education and partnership with the community. The Deming Center does this in part by educating, engaging and partnering and focusing on student experience.

Cutting-edge Curriculum. Our progressive curriculum and interdisciplinary programs include:

- courses in entrepreneurial finance, marketing and business planning
- interdisciplinary programs in engineering, business, law and environmental studies
- undergraduate business minor with a Certificate of Entrepreneurship for students across campus
- undergraduate Certificate of Entrepreneurship for Leeds students
- MBA concentration in entrepreneurship
- world renowned PhD program in entrepreneurship

The Deming Center supports the entrepreneurial curriculum and advances the Leeds School's leadership agenda through our collaborative initiatives across campus and in the business community in these key areas:

- **Education.** Our entrepreneurship students have access to a world class entrepreneurship faculty. The faculty are involved in collecting, curating and making available the latest research and thinking on entrepreneurship in the world. These faculty are inspiring and directing new research and thought leadership in entrepreneurship and constantly working with thought leaders to develop and stay ahead of the latest trends and tools for entrepreneurship education.
- **Real World Experience.** Our entrepreneurship students are challenged to turn accepted thinking on its head—in the classroom, in real-world industry projects, and by the business innovators serving as student mentors and advisors. The center helps connect students with projects, advisors and internships that challenge them to use their new skills creatively.
- **Student Experience.** Staff and faculty at Deming are focused on delivering an outstanding student experience. Deming promotes the development of entrepreneurial thinkers and doers. Entrepreneurial thinkers and doers are optimistic, resilient, resourceful, persistent, calculated risk-takers, efficient, creative problem solvers and effective workers. These are teachable skills any student is capable of learning.
- **The Community.** Boulder is consistently named one of the best places in the country to launch a startup. The center connects students to industry leaders via the Deming Network—an active group of world-class entrepreneurs and innovators who are accessible and hands-on. CU-Boulder is also a top research university. Across campus, the Deming Center helps students access opportunities in technology transfer and the engineering, law, biofrontiers and environmental science programs

Real Estate Center

The Real Estate Center, founded in 1995, is supported by an industry council with the goal of advancing academic excellence in real estate

education and scholarship. The center oversees the school's real estate teaching programs and advises the faculty in designing an integrated curriculum at both the graduate and undergraduate levels. Course work is drawn from the law school, the colleges of architecture and engineering, construction management and others.

The center creates real-world experiences for students by providing project course work and being a resource for securing internships, mentors and jobs. It also provides support for faculty teaching and research activities in real estate and, through the Real Estate Foundation, assists the university with its real estate portfolio.

Burridge Center for Securities Analysis and Valuation

The Burridge Center for Securities Analysis and Valuation is dedicated to encouraging and supporting the creation and dissemination of new knowledge about the world financial markets with an emphasis on the U.S. financial markets by:

- facilitating the exchange of ideas and knowledge between professional investment managers, finance scholars, policy makers and the investing public;
- identifying critical research issues in the theory and practice of security analysis and valuation; and
- encouraging and supporting rigorous qualitative and quantitative research on topics relevant and useful to money managers, valuation experts and finance academics.

Center for Education on Social Responsibility (CESR)

CESR's goal is to help students become outstanding business leaders of tomorrow by preparing them to meet the ethical challenges posed by a highly competitive, globally-connected business world. Accordingly, CESR oversees the infusion of values and social responsibility discussions throughout the undergraduate and graduate curricula at the Leeds School of Business. As part of the central mission at Leeds, CESR creates pedagogies that are national models and plays a leadership role carrying out the school's commitment to developing leaders of conscience. Although the Center's primary focus is on excellence in curriculum development and delivery, CESR also undertakes a broad spectrum of initiatives including a certificate program, student organizations, conferences and other extracurricular offerings as well as providing funding and administrative support for faculty research.

Courses

CESR is directly responsible for course development, staffing and coordination of the Business requisite introduction course World of Business, and collaborates on the design and delivery of the requisite 3000-level course Business Law, Ethics & Social Responsibility. CESR also offers leading edge electives such as CESR 4000, CESR 4005, CESR 4827/ACCT 4827, CESR 4828/MGMT 4828 and the Global Seminar *Social Entrepreneurship & Innovation* in Panama.

Certificate and Portfolio

CESR offers specialized recognition for students at the undergraduate and graduate levels. Undergraduates wishing to focus on CESR-related topics may earn the Certificate in Socially Responsible Enterprise (SRE). At the MBA level, CESR has formalized a Sustainability Portfolio of courses, including the MBA requisite Socially Responsible Enterprise course, and electives such as MBAX 6570 and MBAX 6140.

CESR Co-Curricular Activities

- **CESR Stampede at Leeds: A Week of Driving Values in Business.** This weeklong event showcases the values-driven and innovative curriculum developed by the CESR that is shaping tomorrow's

business leaders. Through class visits, expert panels and lectures student competitions and showcases, attendees will explore their own values and network with like-minded professionals about applying positive values in a business setting. Stampede Week also includes the fourth annual Conscious Capitalism Conference, a CESR flagship event.

CESR routinely hosts events aimed at our students, our local business community and educators and industry leaders throughout the academic year. Guest speakers change each semester, but recurring events are included here:

- **CESR Business Ethics Case Competition (BECC).** The CESR BECC is an interactive way to deepen the Leeds undergraduate students' understanding of the importance of creating ethical as well as profitable business cultures. Teams are provided with a business case in the weeks leading up to the competition which they will have to analyze, create recommendations for course of action and present their solutions to a panel of professional judges. Cash prizes are awarded to the top three teams.
- **Conscious Capitalism Conference.** An annual conference hosted by CESR featuring innovative executives and entrepreneurs who have used the traditional tools of capitalism to serve social needs.
- **Student Center for Social Entrepreneurship.** CESR provides faculty sponsorship for SCSE, the student branch of Social Entrepreneurship for Equitable Development, an interdisciplinary, inter-generational campus group that is involved in researching, teaching and generating student involvement in the areas of social entrepreneurship and sustainable community development.
- **Net Impact Club.** CESR is home to a graduate chapter of Net Impact, an international non-profit organization whose mission is to use the power of business to create a more socially and environmentally sustainable world.
- **New Venture Challenge Social Impact Track.** CESR developed and continues to support the Social Impact Track of the **CU New Venture Challenge**, a campus-wide initiative connecting students and faculty with teammates in a broad range of disciplines and with mentors from the business community. The goal is to provide knowledge and experience making entrepreneurship accessible to anyone on the CU-Boulder campus with the enthusiasm and creativity required to start a new business.

Programs & Leadership

Professional Mentorship Program

The Professional Mentorship Program (PMP) is a unique program that offers one-on-one professional mentoring to current undergraduate students. The program's mission is to enhance business education at the Leeds School by offering hands-on learning, professional skills development, leadership opportunities and a sense of connection and community among current students, Leeds alumni and corporate partners. PMP mentors prepare and inspire our students to become the next generation of strong business leaders.

This two-year program matches students with executives or high-level business professionals who align by industry, geographic location or functional area. To ensure a quality experience for both students and mentors, the PMP provides workshops, training and additional support for participants throughout the program.

Program Benefits

Through this program, students gain an additional level of advising and career counseling from a business professional. Through the mentoring relationships, students can explore choice of majors, potential for graduate school, work-life balance and effective networking and job search strategies.

Other potential benefits of being involved in the PMP include:

- Advice and assistance on academic questions, career options, life beyond college and more
- Access to the PMP network and networking opportunities and the opportunity to start building the student's own professional network
- Opportunities to practice and strengthen professional communication and presentation skills
- Help in defining personal and professional goals, and the strategies to achieve them
- Unique internship and job opportunities
- Development of a life-long friend and connection in the business world

Contact Information

Website: leedsmentoring.colorado.edu/about (<http://leedsmentoring.colorado.edu/about>)

Email: leedspmp@colorado.edu

Office: Koebel S220C

Phone: 303-492-5881

Study Abroad

Study abroad programs are available for students interested in international business or in cultural experiences abroad. The college-sponsored London Seminar in International Finance and Business is a five-week-long program held each summer in the financial district of London and is open to juniors, seniors and graduate students.

Student Organizations

Listed below are undergraduate organizations that promote professional interests and provide recognition of scholastic attainment:

- Alpha Kappa Psi
- Athletic Business Club
- CU Fashion Club
- Beta Alpha Psi
- Collegiate DECA
- CU Energy Club
- CU Finance Club
- CU American Marketing Association
- CU Investment Club
- CU Society for Human Resources Management
- Delta Sigma Pi
- International Business Club
- Leeds Ambassadors
- Leeds Association of Information Systems
- Leeds Council (Undergraduate Student Government)
- Multicultural Business Student Alliance
- Music Industry Club
- Real Estate Club
- Women in Business Club

Leeds School of Business Student Government

Leeds Council is the governing body of the Leeds School of Business that strives to serve, support and represent the student body. The council also works to make Leeds a better business school through social, academic and professional programming. The council is made up of five primary committees and an executive board that control a significant portion of the Leeds student fees.

Two members of Leeds Council also serve as representatives on University of Colorado Student Government (CUSG) to voice the interests of business students at the main campus.

Career Opportunities

Leeds School of Business graduates are prepared for positions in the following fields:

- Accounting—public, private, nonprofit and governmental
- Banking and other financial institutions
- Consulting
- Corporate financial management
- Entrepreneurship and small business management
- Financial analysis
- Human resources management
- Information systems
- International business
- Investment management
- Management consulting and organization management
- Marketing and sales management
- Nonprofit management
- Operations management
- Real estate
- Retailing
- Taxation
- Technology management
- Transportation
- Venture capital

Other graduates hold positions in fields as diverse as business journalism, public relations, city planning, chamber of commerce and trade association management, college administration and government. The entrepreneurial area of application prepares students to start their own business ventures to take positions in emerging growth companies and the venture capital industry.

Programs of Study

The new innovation economy requires—and rewards—richer knowledge, sharper skills and a global mindset. Ultimately, the edge belongs to those who are principled leaders who bring inspiration and purpose to their work and in this way drive value for society.

Within this climate, the Leeds School of Business offers an innovative agenda designed to leverage our unique assets: the intellectual capital of Leeds faculty, our innovative and best-in-class curriculum, our focus on the "whole student" experience, our strong network of alumni and industry partners and our firm commitment to student support.

World-class faculty provide the foundation for breakthrough thinking—creating knowledge from research, disseminating knowledge through

teaching and applying knowledge in collaboration with the business community. Faculty discoveries are frequently published in prestigious academic journals and discussed in media outlets such as the *Wall St. Journal*, the *New York Times*, CNBC and more. The cutting-edge research we produce enhances the school's reputation for innovation.

From orientation to graduation, Leeds faculty and staff guide students to discover and optimize their potential. Through an array of targeted services, students create an individualized journey that maximizes the impact of their experience and leads to future opportunities. Ethics and social responsibility are hallmarks of a Leeds education, and the school's commitment to professional development is unrivaled.

Leeds alumni and industry partners collaborate to offer a meaningful level of engagement with students and faculty. Alumni provide the support and resources that ensure graduates are poised for maximum impact. Corporate partners infuse relevance to Leeds' curriculum innovation, supporting new programs and providing the school access to professional talent. Both communities are the backbone of one of the largest mentoring programs in the world.

Leeds joins the University of Colorado and the Boulder community to generate extraordinary opportunities for students. Cross-campus collaborations with fields like engineering and science link Leeds faculty and students with more resources to put innovation into action. Our location in Boulder provides inspiration with its physical beauty as well as the intellectual energy of a thriving start-up community and high concentrations of advanced technology and socially responsible industries.

Together, these assets make Leeds uniquely qualified to deliver on our mission of educating principled, innovative leaders who drive value.

Master's Degrees

- Accounting - Master of Science (MS) (p. 1130)
- Business Analytics - Master of Science (MS) (p. 1139)
- Finance - Master of Science (MS) (p. 1139)
- Taxation - Master of Science (MS) (p. 1141)

See the Business Administration (p. 1131) section for those degrees.

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, Heather L (https://experts.colorado.edu/display/fisid_143714)
Instructor; PhD, University of Maryland College Park Campus

Appenzeller, William
Professor Emeritus

Balkin, David B (https://experts.colorado.edu/display/fisid_105481)
Professor; PhD, University of Minnesota Twin Cities

Ballantine, John T (https://experts.colorado.edu/display/fisid_102703)
Senior Instructor; JD, University of Colorado Boulder

Bangs, F. Kendrick
Professor Emeritus

Beagle, Chauncey M.
Professor Emeritus

Bernthal, Wilmar F.
Professor Emeritus

Bhagat, Sanjai (https://experts.colorado.edu/display/fisid_100789)
Professor; PhD, University of Washington

Borum, John Owen (https://experts.colorado.edu/display/fisid_147714)
Instructor; JD, University of Colorado Boulder

Boss, Russel Wayne (https://experts.colorado.edu/display/fisid_105260)
Professor; PhD, University of Georgia

Buchman, Thomas A.
Professor Emeritus; PhD, University of Illinois

Campbell, Margaret Catherine (https://experts.colorado.edu/display/fisid_118141)
Professor; PhD, Stanford University

Cateora, Phillip R.
Professor Emeritus

Chen, Zeyun (https://experts.colorado.edu/display/fisid_147332)
Assistant Professor; PhD, University of Houston-Downtown

Christoff, Lorna Colleen (https://experts.colorado.edu/display/fisid_146614)
Instructor

Cookson, John Anthony (https://experts.colorado.edu/display/fisid_152874)
Assistant Professor; PhD, University of Chicago

Correll, Mark R.
Professor Emeritus

Cropanzano, Russell Salvador (https://experts.colorado.edu/display/fisid_151710)
Professor; PhD, Purdue University

Dam, Robert Anthony (https://experts.colorado.edu/display/fisid_155860)
Assistant Professor; PhD, Northwestern University

Darnell, Jerome C.
Professor Emeritus

Davies, Shaun William (https://experts.colorado.edu/display/fisid_152995)
Assistant Professor; PhD, University of California-Los Angeles

de Langhe, Bart (https://experts.colorado.edu/display/fisid_149819)
Assistant Professor; PhD, Erasmus University (Netherlands)

Delgado, Francisco Antenor (https://experts.colorado.edu/display/fisid_109275)
Senior Instructor; PhD, University of Pennsylvania

Demaree, John D.
Professor Emeritus

Donchez, Robert M (https://experts.colorado.edu/display/fisid_101267)
Senior Instructor; MBA, Fordham University

Engel, Steven
Professor Emeritus

Ertimur, Yonca (https://experts.colorado.edu/display/fisid_151585)
Associate ProfessorProfessor; PhD, New York University

Fernbach, Philip M (https://experts.colorado.edu/display/fisid_149786)
Assistant Professor; PhD, Brown University

Frederick, David M (https://experts.colorado.edu/display/fisid_101543)
Associate Professor; PhD, University of Michigan Ann Arbor

Garcia, Diego (https://experts.colorado.edu/display/fisid_156036)
Professor; PhD, University of California-Berkeley

Garnand, John J.
Professor Emeritus

Glover, Fred W.
Professor Emeritus

Goeldner, Charles R.
Professor Emeritus

Gordon, Kenneth R.
Professor Emeritus

Gross, David Michael (https://experts.colorado.edu/display/fisid_109026)
Senior Instructor; PhD, University of Colorado Boulder

Gwozdz, Ronald Scott (https://experts.colorado.edu/display/fisid_144830)
Instructor; MBA, University of Colorado Boulder

He, Chuan (https://experts.colorado.edu/display/fisid_124857)
Associate Professor; PhD, Washington University

Hekman, David R (https://experts.colorado.edu/display/fisid_151359)
Assistant ProfessorAssociate Professor; PhD, University of Washington

Jackson, Betty R.
Professor Emeritus

Jagolinzer, Alan David (https://experts.colorado.edu/display/fisid_148591)
Associate Professor; PhD, Pennsylvania State University

Jedamus, Paul E.
Professor Emeritus

Jennings, Tracy M (https://experts.colorado.edu/display/fisid_128765)
Senior InstructorInstructor

Jensen, Howard G.
Professor Emeritus

Johnson, Stefanie Kathleen (https://experts.colorado.edu/display/fisid_153813)
Assistant Professor; PhD, Rice University

Kline, Bruce Richard (https://experts.colorado.edu/display/fisid_146513)
Senior Instructor; MA, Northwestern University

Koberg, Christine S.
Professor Emeritus

Kolb, Burton A.
Professor Emeritus

Kornish, Laura Joyce (https://experts.colorado.edu/display/fisid_139966)
Associate Professor; PhD, Stanford University

Kozar, Kenneth A.
Professor Emeritus; PhD, University of Minnesota

Laguna, Manuel (https://experts.colorado.edu/display/fisid_102975)
Professor; PhD, University of Texas at Austin

Larsen, Kai Rune (https://experts.colorado.edu/display/fisid_118160)
Associate Professor; PhD, SUNY at Albany

Lawrence, Stephen R (https://experts.colorado.edu/display/fisid_102032)
Associate Professor; PhD, Carnegie Mellon University

Lazar, Joseph
Professor Emeritus

Leach, Chris (https://experts.colorado.edu/display/fisid_105152)
Professor; PhD, Cornell University

Lee, Jintae (https://experts.colorado.edu/display/fisid_115390)
Associate Professor; PhD, Massachusetts Institute of Technology

Lewis, Barry L.
Professor Emeritus

Lewis, Mary Beth (https://experts.colorado.edu/display/fisid_153829)
Senior Instructor; MBA, University of Pittsburgh Bradford Campus

Lichtenstein, Donald (https://experts.colorado.edu/display/fisid_101701)
Professor; PhD, University of South Carolina - Columbia

Lymberopoulos, John P.
Professor Emeritus

Lynch, John G. (https://experts.colorado.edu/display/fisid_147448)
Professor; PhD, University of Illinois at Chicago

Macfee, Raymond D. Jr
Professor Emeritus

Marshall, Nathan Thomas (https://experts.colorado.edu/display/fisid_156034)
Assistant Professor; PhD, Indiana University Bloomington

Matusik, Sharon Marie Frances (https://experts.colorado.edu/display/fisid_133564)
Professor; PhD, University of Washington

Mc Nown, Robert F (https://experts.colorado.edu/display/fisid_105915)
Professor; PhD, University of California-San Diego

McGraw, Albert Peter (https://experts.colorado.edu/display/fisid_133262)
Associate Professor; PhD, Ohio State University

McMahon, Kevin Christopher (https://experts.colorado.edu/display/fisid_143892)
Senior Instructor; MBA, Indiana University-Purdue Univ at Indianapolis

Meyer, G. Dale
Professor Emeritus

Milburn, Catherine Knoll (https://experts.colorado.edu/display/fisid_142214)

Senior Instructor; MS, University of Colorado Boulder

Mohr, Peter J (https://experts.colorado.edu/display/fisid_155498)

Senior Instructor; MS, Colorado State University

Montealegre, Jose Ramiro (https://experts.colorado.edu/display/fisid_100072)

Associate Professor; DBA, Harvard University

Morley, Susan (https://experts.colorado.edu/display/fisid_116716)

Senior Instructor; JD, University of Colorado Boulder

Morrison, Edward J.

Professor Emeritus

Moyen, Nathalie (https://experts.colorado.edu/display/fisid_113873)

Associate Professor; PhD, Univ of British Columbia (Canada)

Mueller, Erick Michael (https://experts.colorado.edu/display/fisid_140940)

Senior Instructor; MBA, University of Colorado Boulder

Nelson, James E.

Professor Emeritus

Nelson, Thomas Cavett (https://experts.colorado.edu/display/fisid_116011)

Senior Instructor; PhD, University of Colorado Boulder

Oest, Donald G (https://experts.colorado.edu/display/fisid_146623)

Instructor; MBA, Fairleigh Dickinson University

Palmer, Michael

Professor Emeritus

Papuzza, Antonio (https://experts.colorado.edu/display/fisid_145295)

Instructor; PhD, Univ of Florence (Italy)

Parkin, Don

Professor Emeritus

Payne, David Sanders (https://experts.colorado.edu/display/fisid_143848)

Instructor

Reinholtz, Nicholas S (https://experts.colorado.edu/display/fisid_155180)

Assistant Professor; PhD, Columbia University In the City of New York

Reuer, Jeffrey J (https://experts.colorado.edu/display/fisid_155768)

Professor; PhD, Purdue University

Reznicek, Birdie C (https://experts.colorado.edu/display/fisid_149091)

Instructor

Richey, Clyde W.

Professor Emeritus

Ringgenberg, Ralph G.

Professor Emeritus

Rock, Steven Karl (https://experts.colorado.edu/display/fisid_113689)

Associate Professor; PhD, Pennsylvania State University

Rogers, Jonathan L (https://experts.colorado.edu/display/fisid_153009)

Associate Professor; PhD, University of Pennsylvania

Rosse, Joseph G (https://experts.colorado.edu/display/fisid_105706)

Professor; PhD, University of Illinois at Urbana-Champaign

Rush, David F.

Professor Emeritus

Schattke, Rudolph

Professor Emeritus

Schaub, Kevin D. (https://experts.colorado.edu/display/fisid_144142)

Instructor; MBA, University of Colorado Boulder

Sears, Curtis R (https://experts.colorado.edu/display/fisid_145482)

Senior Instructor; JD, University of Colorado Boulder

Selto, Frank

Professor Emeritus; PhD, University of Washington

Seward, Lori Elizabeth (https://experts.colorado.edu/display/fisid_113934)

Senior Instructor; PhD, Virginia Polytechnic Institute and State Univ

Sorenson, Ralph Z.

Professor Emeritus

Spinetto, Richard D.

Professor Emeritus

Stanton, William J.

Professor Emeritus

Stapp, Elizabeth Cole (https://experts.colorado.edu/display/fisid_149889)

Instructor; JD, Boston University

Stephenson, Craig A (https://experts.colorado.edu/display/fisid_144851)

Senior Instructor; PhD, University of Arizona

Stockton, Keith Michael (https://experts.colorado.edu/display/fisid_143887)

Instructor; PhD, University of Colorado Boulder

Stutzer, Michael J. (https://experts.colorado.edu/display/fisid_126711)

Professor; PhD, University of Minnesota Twin Cities

Sun, Yacheng (https://experts.colorado.edu/display/fisid_145680)

Assistant Professor; PhD, Indiana University Bloomington

Taylor, Robert H.

Professor Emeritus

Thibodeau, Thomas G (https://experts.colorado.edu/display/fisid_134750)

Professor; PhD, SUNY at Stony Brook

Tice, Frances Mei-Lin Siu (https://experts.colorado.edu/display/fisid_156018)

Assistant Professor; PhD, Texas AM University

Tong, Wenfeng (https://experts.colorado.edu/display/fisid_144520)

Associate Professor; PhD, Ohio State University

Tracy, John A.

Professor Emeritus

Van Wesep, Edward D (https://experts.colorado.edu/display/fisid_154573)

Associate Professor; PhD, Stanford University

Vossen, Thomas Wilhelmus (https://experts.colorado.edu/display/fisid_126642)

Associate Professor; PhD, University of Maryland College Park Campus

Waddell, Jay L (https://experts.colorado.edu/display/fisid_151520)

Instructor; MS, University of Wisconsin-Madison

Wang, Yanwen (https://experts.colorado.edu/display/fisid_154266)

Assistant Professor; PhD, Emory University

Waters, Brian Todd (https://experts.colorado.edu/display/fisid_155846)

Assistant Professor; PhD, University of California-Los Angeles

Wenger, Paula (https://experts.colorado.edu/display/fisid_113621)

Senior Instructor; MA, Miami University Oxford Campus

Williams, Lawrence Edwin (https://experts.colorado.edu/display/fisid_145743)

Assistant Professor Associate Professor; PhD, Yale University

Willis, Michael Jared (https://experts.colorado.edu/display/fisid_152040)

Senior Instructor; MBA, Brigham Young University

Winn, Daryl

Professor Emeritus

Yao, Xin (https://experts.colorado.edu/display/fisid_147215)

Assistant Professor; PhD, University of Washington

York, Jeffrey Glenn (https://experts.colorado.edu/display/fisid_148387)

Assistant Professor; PhD, University of Virginia

Zechman, Sarah Louise Center (https://experts.colorado.edu/display/fisid_156016)

Associate Professor; PhD, University of Pennsylvania

Zender, Jaime (https://experts.colorado.edu/display/fisid_122563)

Professor; PhD, Yale University

Zhang, Dan (https://experts.colorado.edu/display/fisid_149619)

Associate Professor Assistant Professor; PhD, University of Minnesota Twin Cities

Courses

For business administration (BADM) courses, see the Business Administration (p. 1135) section.

Accounting

ACCT 5240 (3) Advanced Financial Accounting

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4240

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

ACCT 5250 (3) Financial Statement Analysis

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4250

Requisites: Requires prerequisite course of ACCT 3220 or ACCT 3225 (min grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5330 (3) Advanced Cost Management

Critically analyzes advanced topics in cost management. Uses cases and current readings.

Requisites: Requires prerequisite course of ACCT 3320 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5410 (3) Income Tax Accounting

ACCT 5450 (3) Income Taxation of Business Entities

Examines the income tax consequences of business entities. Focuses on regular corporations, partnerships, limited liability companies and S corporations.

Requisites: Restricted to C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX or BUAD graduate students only.

Recommended: Prerequisite ACCT 3230.

ACCT 5540 (3) Accounting Information Systems

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4540

Requisites: Requires prerequisite course of ACCT 3220 or 3225 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5620 (3) Auditing and Assurance Services

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4620

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

ACCT 5700 (3) International Accounting

Intensive focus on international financial statement analysis, cultural and economic differences that affect financial reporting in various countries. Examples include international financial reporting standards and accounting for foreign currency transactions.

Requisites: Requires prerequisite course of ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5800 (3) Accounting for Government and Nonprofit Organizations
Reporting, planning and control of government and nonprofit organizations. Includes program budgets, responsibility accounting and fund accounting.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4800

Requisites: Requires prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5820 (3) Topics in Business

Offered irregularly to provide opportunity for investigation of new frontiers in accounting.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4820

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

ACCT 5821 (3) Experimental Seminar. Financial Report for Complex Transactions

Focuses on topics related to major financial events in the life of an organization (IPOs, mergers and acquisitions). Enhance the ability to understand the economic essence of important complex business transactions as linked to the financial reporting and tax issues surrounding these deals. Many fascinating and recent transactions will be examined in depth.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4821

Requisites: Requires a prerequisite course of ACCT 3230 (minimum grade D-). Restricted to ACCT or ACTX or BUAD or or FNCEACCT or ACCTACTX students only.

ACCT 5827 (3) Integrated Reporting for Socially Responsible Strategies

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4827 and CESR 4827

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 5828 (3) Experimental Seminar. AIS Audit

Accounting Information Systems are pervasive in every organization, large or small, creating new risks for these organizations and their auditors. Teaches auditors techniques for understanding how these systems work, how the business uses them to improve business performance and how they impact the audit.

ACCT 5830 (3) Experimental Seminar. Recent Developments in Financial Reporting

Focuses on emerging financial reporting issues in the United States and Internationally.

Requisites: Requires prerequisite course of ACCT 3230 (min grade D-). Restricted to Accounting, Finance/Accounting, Info Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Admin (BUAD) grad students only

ACCT 6000 (1-4) Academic Internship in Accounting

Offers students the opportunity to gain professional work experience in an accounting or tax position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes lectures and a course paper. Students may not preregister for this course, and they must contact the Director of the concurrent degree program in accounting for approval. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

Grading Basis: Pass/Fail

ACCT 6220 (3) Corporate Financial Reporting

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues. Students with credit for ACCT 3220 and 3230 or equivalents may not receive credit for ACCT 6220.

Equivalent - Duplicate Degree Credit Not Granted: MBAX 6700

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-).

ACCT 6250 (3) Financial Statement Analysis

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers and auditors. Emphasizes equity analysis.

Equivalent - Duplicate Degree Credit Not Granted: MBAX 6710

Requisites: Requires prerequisite course of ACCT 5250 or MBAC 6020 (minimum grade D-).

ACCT 6260 (3) Seminar. Managerial Accounting

Explores cost management, especially as related to organizational decision making, planning, and control. Emphasizes case analysis and applications.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-).

ACCT 6270 (3) Seminar. Income Determination

Critical analysis of problems and theory of measurement and reporting of periodic net income of business organizations. Net income models, research efforts, and role of professional accounting organizations. Current issues and problems given special attention.

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-).

ACCT 6350 (3) Current Issues in Professional Accounting--Accounting Ethics

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Also explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets. Counts as senior seminar for Concurrent degree students.

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 6420 (3) Research and Writing in Income Taxation

Studies and applies the method used in tax research and tax planning, with the goal of developing tax research, technical writing and tax planning skills. Topics include examining primary and secondary sources of federal tax law, evaluating the hierarchy of these sources and developing technical writing skills using deductive legal reasoning.

Requisites: Requires a prerequisite course of ACCT 5450 (minimum grade D-). Restricted to MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

ACCT 6430 (3) Taxation of Partnerships

Studies federal income taxation of pass-through entities such as those used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6167

Requisites: Requires prerequisite course of ACCT 5450 (min grade D-). Restricted to MS-ACCT or MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

ACCT 6440 (2-3) Tax Policy

Offers a research seminar exploring policy issues of taxation including recent legislative proposals. Students prepare a publishable research paper on a tax policy topic agreed upon with the instructor.

Requisites: Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 and 6700.

ACCT 6450 (3) Taxation of Corporations

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6157

Requisites: Requires corequisite courses of ACCT 6420 and ACCT 6700. Restricted to Bus Admin, Acct, Acct-Tax, Acct-Info Syst, Mgt Sci-Info Syst, Fnce, Mktg or Master of Business Admin graduate students only.

ACCT 6460 (3) Civil/Criminal Tax Proc**ACCT 6470 (3) Frgn Source Income Tax****ACCT 6490 (3) Taxation of Natural Resources**

Concerned with tax problems encountered in acquisition, operation, and disposition of natural resource properties. Topics include depletion, lease bonuses, intangible drilling costs, depreciation, and financing arrangements. Department enforced requisite: admission to the graduate tax program.

Requisites: Requires a prerequisite course of ACCT 6700 (minimum grade D-).

ACCT 6500 (3) Special Topics in Taxation

Covers a diverse array of issues in taxation. Highlights areas of current interest and draws on the strengths of leading outside authorities as guest lecturers in various topic areas.

Requisites: Requires a prerequisite courses of ACCT 6420 and ACCT 6700 (all minimum grade D-).

ACCT 6620 (3) Advanced Auditing: Business Risk and Decision Analysis

Explores contemporary issues, historical developments, and selected topics pertinent to business assurance services by independent accountants. Emphasizes improving both the decision behavior of decision makers and the quality of information, or its context, for decision makers.

Requisites: Requires a prereq course of ACCT 5620 (min grade D-). Restricted to Acct, Fnce/Acct, Infor Syst/Acct, Syst/Acct Concurrent Degree students or Acct, Acct/Tax or Busn Admin (BUAD) graduate students only.

ACCT 6700 (4) Income Taxation

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6007

Requisites: Requires a prerequisites course of ACCT 5450 (minimum grade D-). Restricted to Accounting (ACCT), MS-ACTX or C-ACCTACTX or FNCEACTX students only.

ACCT 6710 (3) Federal Estate and Gift Tax

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7207

Requisites: Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 6700. Restricted to ACCT, ACIS, ACTX, MBA or BUAD graduate students only.

ACCT 6720 (2) Estate Planning

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7217

Requisites: Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

ACCT 6760 (2-3) State and Local Taxation

Examines the operation of the income, property and sales tax used to finance our state and local governments. Includes requirements of equal protection and due process. Covers jurisdiction to tax allocation of the tax base among different state and local governments.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7507

ACCT 6770 (3) Wills and Trusts**ACCT 6780 (3) International Taxation**

Covers basic aspects of the United States taxation of income earned abroad by its citizens and the taxation of income derived by foreign persons from U.S. sources, including the implications of income tax treaties.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7617

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 6820 (1-3) Graduate Seminar

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in accounting. Department enforced prerequisites: varies

ACCT 6900 (1-6) Independent Study

Prior department consent required of instructor under whose direction study is taken. Departmental form required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 6940 (1) Master's Degree Candidacy

Departmental form required.

Requisites: Restricted to Business (BUSN) graduate students only.

Grading Basis: Pass/Fail

ACCT 6950 (1-4) Master's Thesis

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7300 (3) Doctoral Seminar: Introduction to Accounting Research

Discusses the nature of scientific investigation and how accounting theory relates to theories in economics and finance. Introduces students to major areas of accounting research and research methods. Provides students with instruction and experience in evaluating and critiquing research papers as well as generating original and viable research ideas.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7320 (3) Doctoral Seminar: Accounting and Capital Markets I

Focuses on research evaluating the usefulness of accounting information for valuing equity securities. The seminar builds a foundation for conducting accounting-related capital markets research.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7330 (3) Doctoral Seminar: Accounting and Capital Markets 2

Focuses on how managers strategically communicate with capital market participants (e.g., investors and equity analysts). Students develop an understanding of how information enhances the efficiency of stock markets, why managers voluntarily disclose information, and how market participants react to strategic disclosure.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7340 (3) Doctoral Seminar: Managerial Accounting Research

Survey of managerial accounting research, emphasizing a variety of methodologies including economics-based archival empirical and experimental approaches. Topics include: management performance measurement; management incentives; non-financial performance measures; management control systems; cost behavior and cost structure; intra-firm transfer pricing; inter-firm relations and knowledge sharing; risk preferences; risk taking and risk sharing; strategic performance measurement; agency theory; and budgetary slack and performance.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

ACCT 7800 (3) Doctoral Seminar: Accounting Theory

Follows the evolution of game-theoretical analytical research and application of analytical methods to topics including: accounting-based valuation, discretionary disclosure, stewardship role of accounting, insider trading and imperfect capital market models, signaling through accounting choice, deferred tax accounting, audit sampling, auditor rotation, and low balling. Describes implications of analytical results for primarily economics-based empirical research designs.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7830 (3) Doctoral Seminar: Accounting Research

Designed to assist the doctoral student in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in accounting. Special attention given to the development of thesis topics.

ACCT 8820 (1-6) Graduate Seminar

Provides opportunity for investigation of new frontiers in accounting through an experimental seminar. Department enforced prereq.: varies

Repeatable: Repeatable for up to 6.00 total credit hours.

ACCT 8900 (1-3) Independent Study

Instructor consent required and departmental form (taught as doctoral seminar).

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 8990 (1-10) Doctoral Thesis

Requisites: Restricted to Business (BUSN) graduate students only.

Business Environment & Policy**BPOL 6940 (1) Master's Candidate for Degree**

Grading Basis: Pass/Fail

BPOL 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

BPOL 7500 (3) Doctoral Seminar: Strategic Management 1

Provides an overview of the literature, including classic articles and books, in business strategy and policy (strategic management). Brings the student up to date on schools of thought, research issues, and practical applications in strategic management.

Repeatable: Repeatable for up to 6.00 total credit hours.

BPOL 7530 (3) Doctoral Seminar: Strategic Management 2

Continuation of BPOL 7500.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of BPOL 7500 (minimum grade D-). Restricted to Business Administration (BUAD) graduate students only.

BPOL 7560 (3) Entrepreneurship, International Business and Technology Management

Provides doctoral students with an understanding of strategic management and entrepreneurship theory, as applied to international business and technology management literatures. Additionally, students are exposed to research methods in the strategy and entrepreneurship arenas.

Requisites: Requires prerequisite courses of BPOL 7500 and BPOL 7530 (all minimum grade D-).

BPOL 8900 (1-3) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

BPOL 8990 (1-10) Doctoral Thesis**Business Law****BSLW 5120 (3) Advanced Business Law**

Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

Equivalent - Duplicate Degree Credit Not Granted: BSLW 4120

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

BSLW 6900 (1-6) Independent Study

Requisites: Restricted to Business (BUSN) graduate students only.

Accounting - Master of Science (MS)

A master's degree in accounting prepares students to become financial professionals who can help a wide range of organizations thrive.

Accounting is extremely important to any company because financial information, as analyzed and interpreted by CPAs, allows executives to make informed business decisions that help companies become more successful. Through our program, our graduates develop specific expertise in the area of accounting by strengthening and enhancing the ability to interpret and communicate information about a company's

operations and finances. Academic experience, combined with a practical internship experience, propels our graduates to be proficient in the "language of business" that is accounting.

Typically, over 90 percent of MS accounting students have a job in accounting and financial advisory fields at graduation, and the demand for CU Boulder-educated accountants continues to soar. Many graduates begin careers with public accounting firms in audit, tax or advisory business services. Others prefer information management, tax or compliance positions within corporations. Still other opportunities exist in financial management, nonprofits and government agencies.

An MS in accounting primes graduates to become Certified Public Accountants (CPAs) both academically, in terms of preparing for the CPA exam, and by meeting the State of Colorado education requirements for CPAs (as well as those of most other states). For 2015, students from CU Boulder passed the CPA exam at a rate of 79 percent for first-time test takers, which was the number one ranking for schools in Colorado and 14th nationwide.

Dual Degree Program

BS/MS in Business Administration and Accounting

Qualified Leeds undergraduate students may apply for a five-year concurrent bachelor's/master's program. Student typically begin the concurrent program in the fall of their senior year, and graduate with both the BS and MS degrees after five years. The concurrent degree program is a 150-credit-hour program. Students earn a BS in business administration (p. 562) (120 credits) with a concentration in accounting, finance, or accounting and finance, and an MS in accounting (30 credits).

For more information, visit the Concurrent BS & MS Accounting or Taxation (<http://www.colorado.edu/business/academic-programs/undergraduate-programs/accounting/concurrent-bsba-ms-accounting>) webpage.

Requirements

The MS accounting degree consists of ten graduate-level courses. Students can opt to take additional courses. The degree can be completed in 9–20 months, depending on whether the student wants, and is offered, a busy-season (spring) internship.

The following suggested course pathways are recommended based on a traditional starting date (fall semester), completion date (21 months), and undertaking a busy-season internship. Students can deviate from the suggested pathways depending on their personal timeline and experiences.

Prerequisites

Four intermediate-level accounting courses must be completed before starting the master's-level accounting courses.

ACCT 3220	Corporate Financial Reporting 1	3
ACCT 3230	Corporate Financial Reporting 2	3
ACCT 3320	Cost Management	3
ACCT 3440	Income Taxation of Individuals	3
Total Credit Hours		12

Requirements

Required Courses

ACCT 5240	Advanced Financial Accounting	3
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ACCT 5450	Income Taxation of Business Entities	3
ACCT 5620	Auditing and Assurance Services	3
ACCT 5700	International Accounting	3
ACCT 6350	Current Issues in Professional Accounting-- Accounting Ethics	3
ACCT 6620	Advanced Auditing: Business Risk and Decision Analysis	3
BSLW 5120	Advanced Business Law	3
Electives (Select three)		9-10
ACCT 5250	Financial Statement Analysis	
ACCT 5540	Accounting Information Systems	
ACCT 5820	Topics in Business	
ACCT 5827	Integrated Reporting for Socially Responsible Strategies	
ACCT 5821	Experimental Seminar: Financial Report for Complex Transactions	
ACCT 6420	Research and Writing in Income Taxation	
ACCT 6430	Taxation of Partnerships	
ACCT 6450	Taxation of Corporations	
ACCT 6700	Income Taxation	
ACCT 6900	Independent Study	

Total Credit Hours 30-31

Business Administration

The Leeds School of Business holds accreditation by the Association to Advance Collegiate Schools of Business (AACSB-International). The Leeds School of Business offers programs leading to the following degrees:

- Master of Business Administration (MBA)
- Master of Science (MS)
- Doctor of Philosophy (PhD)

The Leeds School also offers a part-time MBA program called the Evening MBA that leads to the same degree as the full-time MBA program. Dual degree options are not available in the Evening MBA program.

Dual degree options available in the MBA program include:

- MBA/JD (p. 1378)
- MBA/MA in anthropology (p. 880)
- MBA/MFA in art practices (p. 903)
- MBA/MS in computer science (p. 1225)
- MBA/MFA in dance (p. 1112)
- MBA/MS in environmental studies (p. 974)
- MBA/MA in German studies (p. 1007)
- MBA/MS in telecommunications (p. 1270)
- MBA/MA in theatre (p. 1116)

These programs are open to qualified individuals who hold a bachelor's degree from a regionally accredited college or university, or a recognized international university, without regard to their undergraduate major. The Leeds School of Business also offers a concurrent BS/MS program in accounting that awards the bachelor's and master's degrees simultaneously.

Master's Degrees

- Business Administration - Master of Business Administration (MBA) (p. 1135)

Doctoral Degree

- Business Administration - Doctor of Philosophy (PhD) (p. 1138)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Adams, Heather L (https://experts.colorado.edu/display/fisid_143714)
Instructor; PhD, University of Maryland College Park Campus

Appenzeller, William
Professor Emeritus

Balkin, David B (https://experts.colorado.edu/display/fisid_105481)
Professor; PhD, University of Minnesota Twin Cities

Ballantine, John T (https://experts.colorado.edu/display/fisid_102703)
Senior Instructor; JD, University of Colorado Boulder

Bangs, F. Kendrick
Professor Emeritus

Beagle, Chauncey M.
Professor Emeritus

Berenthal, Wilmar F.
Professor Emeritus

Bhagat, Sanjai (https://experts.colorado.edu/display/fisid_100789)
Professor; PhD, University of Washington

Borum, John Owen (https://experts.colorado.edu/display/fisid_147714)
Instructor; JD, University of Colorado Boulder

Boss, Russel Wayne (https://experts.colorado.edu/display/fisid_105260)
Professor; PhD, University of Georgia

Buchman, Thomas A.
Professor Emeritus; PhD, University of Illinois

Campbell, Margaret Catherine (https://experts.colorado.edu/display/fisid_118141)
Professor; PhD, Stanford University

Cateora, Phillip R.
Professor Emeritus

Chen, Zeyun (https://experts.colorado.edu/display/fisid_147332)
Assistant Professor; PhD, University of Houston-Downtown

Christoff, Lorna Colleen (https://experts.colorado.edu/display/fisid_146614)
Instructor

Cookson, John Anthony (https://experts.colorado.edu/display/fisid_152874)
Assistant Professor; PhD, University of Chicago

Correll, Mark R.
Professor Emeritus

Cropanzano, Russell Salvador (https://experts.colorado.edu/display/fisid_151710)
Professor; PhD, Purdue University

Dam, Robert Anthony (https://experts.colorado.edu/display/fisid_155860)
Assistant Professor; PhD, Northwestern University

Darnell, Jerome C.
Professor Emeritus

Davies, Shaun William (https://experts.colorado.edu/display/fisid_152995)
Assistant Professor; PhD, University of California-Los Angeles

de Langhe, Bart (https://experts.colorado.edu/display/fisid_149819)
Assistant Professor; PhD, Erasmus University (Netherlands)

Delgado, Francisco Antenor (https://experts.colorado.edu/display/fisid_109275)
Senior Instructor; PhD, University of Pennsylvania

Demaree, John D.
Professor Emeritus

Donchez, Robert M (https://experts.colorado.edu/display/fisid_101267)
Senior Instructor; MBA, Fordham University

Engel, Steven
Professor Emeritus

Ertimur, Yonca (https://experts.colorado.edu/display/fisid_151585)
Associate Professor; PhD, New York University

Fernbach, Philip M (https://experts.colorado.edu/display/fisid_149786)
Assistant Professor; PhD, Brown University

Frederick, David M (https://experts.colorado.edu/display/fisid_101543)
Associate Professor; PhD, University of Michigan Ann Arbor

Garcia, Diego (https://experts.colorado.edu/display/fisid_156036)
Professor; PhD, University of California-Berkeley

Garnand, John J.
Professor Emeritus

Glover, Fred W.
Professor Emeritus

Goeldner, Charles R.
Professor Emeritus

Gordon, Kenneth R.
Professor Emeritus

Gross, David Michael (https://experts.colorado.edu/display/fisid_109026)
Senior Instructor; PhD, University of Colorado Boulder

Gwozdz, Ronald Scott (https://experts.colorado.edu/display/fisid_144830)
Instructor; MBA, University of Colorado Boulder

He, Chuan (https://experts.colorado.edu/display/fisid_124857)
Associate Professor; PhD, Washington University

Hekman, David R (https://experts.colorado.edu/display/fisid_151359)
Assistant ProfessorAssociate Professor; PhD, University of Washington

Jackson, Betty R.
Professor Emeritus

Jagolinzer, Alan David (https://experts.colorado.edu/display/fisid_148591)
Associate Professor; PhD, Pennsylvania State University

Jedamus, Paul E.
Professor Emeritus

Jennings, Tracy M (https://experts.colorado.edu/display/fisid_128765)
Senior InstructorInstructor

Jensen, Howard G.
Professor Emeritus

Johnson, Stefanie Kathleen (https://experts.colorado.edu/display/fisid_153813)
Assistant Professor; PhD, Rice University

Kline, Bruce Richard (https://experts.colorado.edu/display/fisid_146513)
Senior Instructor; MA, Northwestern University

Koberg, Christine S.
Professor Emeritus

Kolb, Burton A.
Professor Emeritus

Kornish, Laura Joyce (https://experts.colorado.edu/display/fisid_139966)
Associate Professor; PhD, Stanford University

Kozar, Kenneth A.
Professor Emeritus; PhD, University of Minnesota

Laguna, Manuel (https://experts.colorado.edu/display/fisid_102975)
Professor; PhD, University of Texas at Austin

Larsen, Kai Rune (https://experts.colorado.edu/display/fisid_118160)
Associate Professor; PhD, SUNY at Albany

Lawrence, Stephen R (https://experts.colorado.edu/display/fisid_102032)
Associate Professor; PhD, Carnegie Mellon University

Lazar, Joseph
Professor Emeritus

Leach, Chris (https://experts.colorado.edu/display/fisid_105152)
Professor; PhD, Cornell University

Lee, Jintae (https://experts.colorado.edu/display/fisid_115390)
Associate Professor; PhD, Massachusetts Institute of Technology

Lewis, Barry L.
Professor Emeritus

Lewis, Mary Beth (https://experts.colorado.edu/display/fisid_153829)
Senior Instructor; MBA, University of Pittsburgh Bradford Campus

Lichtenstein, Donald (https://experts.colorado.edu/display/fisid_101701)
Professor; PhD, University of South Carolina - Columbia

Lymberopoulos, John P.
Professor Emeritus

Lynch, John G. (https://experts.colorado.edu/display/fisid_147448)
Professor; PhD, University of Illinois at Chicago

Macfee, Raymond D. Jr
Professor Emeritus

Marshall, Nathan Thomas (https://experts.colorado.edu/display/fisid_156034)
Assistant Professor; PhD, Indiana University Bloomington

Matusik, Sharon Marie Frances (https://experts.colorado.edu/display/fisid_133564)
Professor; PhD, University of Washington

Mc Nown, Robert F (https://experts.colorado.edu/display/fisid_105915)
Professor; PhD, University of California-San Diego

McGraw, Albert Peter (https://experts.colorado.edu/display/fisid_133262)
Associate Professor; PhD, Ohio State University

McMahon, Kevin Christopher (https://experts.colorado.edu/display/fisid_143892)
Senior Instructor; MBA, Indiana University-Purdue Univ at Indianapolis

Meyer, G. Dale
Professor Emeritus

Milburn, Catherine Knoll (https://experts.colorado.edu/display/fisid_142214)
Senior Instructor; MS, University of Colorado Boulder

Mohr, Peter J (https://experts.colorado.edu/display/fisid_155498)
Senior Instructor; MS, Colorado State University

Montealegre, Jose Ramiro (https://experts.colorado.edu/display/fisid_100072)
Associate Professor; DBA, Harvard University

Morley, Susan (https://experts.colorado.edu/display/fisid_116716)
Senior Instructor; JD, University of Colorado Boulder

Morrison, Edward J.
Professor Emeritus

Moyen, Nathalie (https://experts.colorado.edu/display/fisid_113873)
Associate Professor; PhD, Univ of British Columbia (Canada)

Mueller, Erick Michael (https://experts.colorado.edu/display/fisid_140940)
Senior Instructor; MBA, University of Colorado Boulder

Nelson, James E.
Professor Emeritus

Nelson, Thomas Cavett (https://experts.colorado.edu/display/fisid_116011)
Senior Instructor; PhD, University of Colorado Boulder

Oest, Donald G (https://experts.colorado.edu/display/fisid_146623)
Instructor; MBA, Fairleigh Dickinson University

Palmer, Michael
Professor Emeritus

- Papuzza, Antonio (https://experts.colorado.edu/display/fisid_145295)
Instructor; PhD, Univ of Florence (Italy)
- Parkin, Don
Professor Emeritus
- Payne, David Sanders (https://experts.colorado.edu/display/fisid_143848)
Instructor
- Reinholtz, Nicholas S (https://experts.colorado.edu/display/fisid_155180)
Assistant Professor; PhD, Columbia University In the City of New York
- Reuer, Jeffrey J (https://experts.colorado.edu/display/fisid_155768)
Professor; PhD, Purdue University
- Reznicek, Birdie C (https://experts.colorado.edu/display/fisid_149091)
Instructor
- Richey, Clyde W.
Professor Emeritus
- Ringgenberg, Ralph G.
Professor Emeritus
- Rock, Steven Karl (https://experts.colorado.edu/display/fisid_113689)
Associate Professor; PhD, Pennsylvania State University
- Rogers, Jonathan L (https://experts.colorado.edu/display/fisid_153009)
Associate Professor; PhD, University of Pennsylvania
- Rosse, Joseph G (https://experts.colorado.edu/display/fisid_105706)
Professor; PhD, University of Illinois at Urbana-Champaign
- Rush, David F.
Professor Emeritus
- Schattke, Rudolph
Professor Emeritus
- Schaub, Kevin D. (https://experts.colorado.edu/display/fisid_144142)
Instructor; MBA, University of Colorado Boulder
- Sears, Curtis R (https://experts.colorado.edu/display/fisid_145482)
Senior Instructor; JD, University of Colorado Boulder
- Selto, Frank
Professor Emeritus; PhD, University of Washington
- Seward, Lori Elizabeth (https://experts.colorado.edu/display/fisid_113934)
Senior Instructor; PhD, Virginia Polytechnic Institute and State Univ
- Sorenson, Ralph Z.
Professor Emeritus
- Spinetto, Richard D.
Professor Emeritus
- Stanton, William J.
Professor Emeritus
- Stapp, Elizabeth Cole (https://experts.colorado.edu/display/fisid_149889)
Instructor; JD, Boston University
- Stephenson, Craig A (https://experts.colorado.edu/display/fisid_144851)
Senior Instructor; PhD, University of Arizona
- Stockton, Keith Michael (https://experts.colorado.edu/display/fisid_143887)
Instructor; PhD, University of Colorado Boulder
- Stutzer, Michael J. (https://experts.colorado.edu/display/fisid_126711)
Professor; PhD, University of Minnesota Twin Cities
- Sun, Yacheng (https://experts.colorado.edu/display/fisid_145680)
Assistant Professor; PhD, Indiana University Bloomington
- Taylor, Robert H.
Professor Emeritus
- Thibodeau, Thomas G (https://experts.colorado.edu/display/fisid_134750)
Professor; PhD, SUNY at Stony Brook
- Tice, Frances Mei-Lin Siu (https://experts.colorado.edu/display/fisid_156018)
Assistant Professor; PhD, Texas AM University
- Tong, Wenfeng (https://experts.colorado.edu/display/fisid_144520)
Associate Professor; PhD, Ohio State University
- Tracy, John A.
Professor Emeritus
- Van Wesep, Edward D (https://experts.colorado.edu/display/fisid_154573)
Associate Professor; PhD, Stanford University
- Vossen, Thomas Wilhelmus (https://experts.colorado.edu/display/fisid_126642)
Associate Professor; PhD, University of Maryland College Park Campus
- Waddell, Jay L (https://experts.colorado.edu/display/fisid_151520)
Instructor; MS, University of Wisconsin-Madison
- Wang, Yanwen (https://experts.colorado.edu/display/fisid_154266)
Assistant Professor; PhD, Emory University
- Waters, Brian Todd (https://experts.colorado.edu/display/fisid_155846)
Assistant Professor; PhD, University of California-Los Angeles
- Wenger, Paula (https://experts.colorado.edu/display/fisid_113621)
Senior Instructor; MA, Miami University Oxford Campus
- Williams, Lawrence Edwin (https://experts.colorado.edu/display/fisid_145743)
Assistant Professor; PhD, Yale University
- Willis, Michael Jared (https://experts.colorado.edu/display/fisid_152040)
Senior Instructor; MBA, Brigham Young University
- Winn, Daryl
Professor Emeritus
- Yao, Xin (https://experts.colorado.edu/display/fisid_147215)
Assistant Professor; PhD, University of Washington
- York, Jeffrey Glenn (https://experts.colorado.edu/display/fisid_148387)
Assistant Professor; PhD, University of Virginia

Zechman, Sarah Louise Center (https://experts.colorado.edu/display/fisid_156016)

Associate Professor; PhD, University of Pennsylvania

Zender, Jaime (https://experts.colorado.edu/display/fisid_122563)

Professor; PhD, Yale University

Zhang, Dan (https://experts.colorado.edu/display/fisid_149619)

Associate ProfessorAssistant Professor; PhD, University of Minnesota
Twin Cities

Courses

BADM 6820 (1-3) Topics in Business Administration

Offered irregularly to provide opportunity to investigate new topics in business administration.

BADM 6900 (3) Mergers, Acquisitions and Reorganizations

Studies the planning of corporate mergers, acquisitions and reorganizations, examining the application and integration of state corporate law, federal securities law, accounting principles, tax law, labor law, products liability law, environmental law, ERISA and antitrust law.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7411

BADM 6910 (3) Law and Finance for Entrepreneurs

Studies unique legal problems faced by entrepreneurs, including formation issues (choice of entity, rights of the founders, initial investors), operation issues (governance, key employees, intellectual property, financing), IPOs and buy-outs.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7451

BADM 6920 (3) Project Management

Presents basic skills required to manage wide range of technical projects. Topics include selecting project alternatives, managing project teams, developing project plan elements, risk management, monitoring and controlling projects, and financial analysis of projects. Students apply skills learned to representative project.

BADM 6930 (3) Commercializing Sustainable Energy Technologies

Addresses the opportunities and problems of commercializing new renewable energy technologies. Focuses on energy markets, opportunity identification, life cycle analysis, policy economics, project financing and economic analysis as they relate to bringing renewable energy technologies to market.

Equivalent - Duplicate Degree Credit Not Granted: ENST 5002

BADM 6940 (3) Land Use Law

Examines Federal, state and local regulations governing land use in the U.S. and surveys the basic principles of urban planning and public finance. Describes basic tools governments use to control land use: Euclidean zoning, nuisance law, police power, eminent domain and takings, Planned Urban Developments, historic preservation, wetlands and flood zones, airports, endangered species, view restrictions, and environmental law.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Business Administration - Master of Business Administration (MBA)

The breadth of training that master of business administration graduates receive prepares them to become high-level managers and lead in a challenging and evolving business environment.

The MBA program is rigorous and comprehensive, and demands student commitment. The curriculum develops a set of broad-based, integrative skills. Core courses provide a solid foundation in both business management and analytical disciplines, a foundation that fosters continued career growth. In addition to core courses stressing key functional areas of business, students can choose electives specific to a chosen area of concentration.

The case study method and student projects are used broadly throughout all courses, and common areas of study such as ethics, technology, communications and international issues are integrated throughout much of the curriculum. Students learn about management theory and its practical applications in “real-world” situations. Lectures, seminars, team teaching, team projects and guest lectures are various approaches taken by the faculty to generate new ideas and encourage student input.

Diversity

The Leeds School of Business encourages qualified individuals to apply regardless of gender, race, religion, national origin, age, physical limitation or sexual orientation.

Concurrent & Dual Degree Programs

Concurrent Degree Program

MBA/Master's International (with Peace Corps Service)

The Leeds School of Business, in conjunction with the Peace Corps, offers a program resulting in a master of business administration (MBA) combined with Peace Corps service. Students spend the first year at Leeds developing a base level of core business skills, followed by two years of volunteer service with the Peace Corps. MI-MBA students will then return to Leeds to complete the remaining MBA degree requirements.

Dual Degree Programs

Juris Doctor/MBA

The purpose of this dual-degree program is to allow students admitted to both the School of Law and the Leeds School of Business to obtain the juris doctor (JD) and the master of business administration (MBA) degrees in four (or fewer) years of full-time study. The program is designed to train students for careers in which business administration and law overlap.

Admission

To be eligible for the JD/MBA dual-degree program of the School of Law and the Leeds School of Business, a student must apply separately to and be admitted by each of the two schools under their respective admission procedures and standards.

Students may elect the dual-degree program at the time of initial application to both schools, or they may apply for the dual-degree program during their first year of study in the degree program of either school.

Course of Study

A student enrolled in the JD/MBA program may commence studies under the program in either the School of Law or the Leeds School of Business. Dual-degree students are strongly encouraged to begin their course of study at the School of Law. However, a student must take the first year of the JD curriculum as a unit exclusively in the School of Law. Likewise, a student must take the first year of the MBA curriculum as a unit exclusively in the Leeds School of Business. Students can then take additional courses necessary to meet the requirements of the degree programs of the two schools.

No student in the dual-degree program shall be allowed to take fewer than 9 credit hours or more than 16 credit hours during any term (excluding summer terms) without receiving the consent of the program advisor in each school in which courses are being taken.

Credit for Law Courses in the JD/MBA Program

The Leeds School of Business grants credit toward the MBA degree for up to 12 credit hours of acceptable performance in law courses taken by a JD/MBA student at the School of Law. Core courses required in the law school program cannot be counted toward the 12 credit hours. A student must earn at least a 77 grade in a law school course to be accepted for Leeds School of Business credit. For credit to be granted, the law school courses must be approved before enrollment by an MBA advisor. Only courses taken after admission into the MBA program are credited toward the degree.

Grading in the Dual-Degree Program

Leeds School of Business credit for courses completed in the School of Law as part of the joint degree program is recorded on a *pass/fail* basis and is not included in the required MBA 3.00 cumulative average.

MBA/MFA

The Leeds School of Business, in conjunction with the Department of Art and Art History, offers students the ability to earn an MBA and an MA in fine arts through a three-year dual-degree program. Students in the MBA/MA dual-degree program pursue careers in digital marketing, web design, e-commerce, gallery/museum administration and private art consulting.

Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

Course of Study

Students in the MBA/MA in fine arts spend the first year of their dual-degree program exclusively in either the business school or the fine arts program. In the second year, courses are taken exclusively in the other department. The third year offers students the opportunity to take both MBA and fine arts elective courses.

Credit for Fine Arts Courses in the MBA/MA Fine Arts Program

Dual-degree students in studio arts are required to complete 43 credit hours of MBA course work and 45 credit hours of fine arts course work. Dual-degree students in art history are required to complete 43 credit hours of MBA course work and 30 credit hours of fine arts course work.

MBA/MA in Anthropology

The MBA/MA in anthropology dual-degree program enables students to earn an MBA and an MA in anthropology simultaneously over three or four years depending on the student's subdiscipline in anthropology.

Students in this MBA/MA program pursue careers in managing the business aspects of archaeological projects, working in the growing field of corporate cultural anthropology and ethnography or museum management.

Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

Course of Study

Students in the MBA/MA in anthropology spend the first year of their dual-degree program exclusively in either the business school or the department of anthropology. In the second year, courses are taken exclusively in the other department. The remaining year(s) offers students the opportunity to take both MBA and anthropology elective courses.

MBA/MA in German Studies

The MBA/MA in German studies dual-degree program enables students to earn an MBA and an MA in German studies simultaneously over three or four years. Students in this MBA/MA program pursue careers in international business.

Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

Course of Study

Students in the MBA/MA in German studies spend the first year of their dual-degree program exclusively in either the Leeds School of Business or the Department of Germanic and Slavic Languages and Literatures. In the second year, courses are taken exclusively in the other department. The remaining year(s) offers students the opportunity to take both MBA and German studies elective courses.

MBA/MA in Theater and Dance

The Leeds School of Business, in conjunction with the Department of Theatre and Dance, offers students the ability to earn an MBA and an MA in theatre or dance through a three-year dual-degree program. Students in the MBA/MA dual-degree program pursue careers in a wide variety of fields and jobs in the world of the performing arts. Types of organizations include theatre companies, dance companies, opera companies, symphonies, arts councils, performing arts complexes, civic auditoriums and arts presenters.

Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

Course of Study

Students in the MBA/MA in theatre and dance spend the first year of their dual-degree program exclusively in either the business school or the theatre/dance program. In the second year, courses are taken exclusively

in the other department. The third year offers students the opportunity to take both MBA and theatre/dance elective courses.

Credit for Courses

Dual degree students are required to complete 43 credit hours of MBA course work and 24 credit hours of theatre/dance course work. A minimum of 67 approved credit hours must be completed to earn both degrees.

MBA/MS in Computer Science

The MBA/MS in computer science enables students to earn an MBA and an MS in computer science over three or four years. Students in this MBA/MS program have career interests that combine corporate business and technology.

Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

Course of Study

Students in the MBA/MS in computer science spend the first year of the dual-degree program exclusively in either the business school or the computer science department. In the second year, courses are taken exclusively in the other department. The remaining year(s) students may take both MBA and computer science electives.

MBA/MS in Environmental Studies

The MBA/MS in environmental studies enables students to earn an MBA and an MS in environmental studies over three or four years. Students in the MBA/MA program have career interests that combine corporate business and environmental protection, the management of renewal energy, water conservation or environmental programs.

Admission

Applicants must apply to both programs and must meet the application requirements for each program separately. Students may apply simultaneously to both programs or may apply to the second program after starting the first master's program, provided they do so during the first year of study.

Course of Study

Students in the MBA/MS in environmental studies spend the first year of the dual-degree program exclusively in either the business school or the environmental studies department. In the second year, courses are taken exclusively in the other department. The remaining year(s) students may take both MBA and environmental studies electives.

MBA/MS in Telecommunications

The Leeds School of Business, in conjunction with the College of Engineering and Applied Science, offers a dual-degree program resulting in a master of business administration (MBA) and master of science in telecommunications (MS/TLEN). The dual-degree program combines broad-based business management study with an in-depth understanding of telecommunications technology. This program prepares students to be competent, effective managers in the telecommunications industry.

Admission

An individual must apply separately and be admitted to both programs under each school's or college's admission procedures and standards. Applicants are encouraged to apply to the programs concurrently.

Course of Study

Students in the MBA/MS in telecommunications spend the first year of the dual-degree program exclusively in either the business school or the telecommunications program. In the second year, courses are taken exclusively in the other department. In the third year students will take both MBA and telecommunications elective courses to complete both master's degrees.

Credit for Courses

Dual degree students are required to complete 43 credit hours of MBA course work and 36 credit hours of telecommunications course work. A minimum of 79 approved credit hours must be completed to earn both degrees.

Requirements

During the first semester of study, to ascertain degree requirements, MBA students should check in with the student services manager for the MBA program.

Students entering the MBA program take a prescribed sequence of classes before beginning elective courses. A minimum of 55 credit hours is needed to graduate. Students entering the MBA program are expected to complete the degree in two years. Transferred course work is not accepted into the MBA program.

MBA students may enroll in up to 12 credit hours of elective course work outside the Leeds School of Business with approval from the MBA Programs office, provided the remaining 18 credit hours of electives are taken within the MBA program. Course work taken outside the Leeds School of Business must be at the graduate program level. Students may not take courses outside the University of Colorado Boulder and count them toward the degree. Students should contact individual departments for course listings and registration requirements for nonbusiness courses.

All courses applied toward the 55 credit hours must be taken for a grade. Courses in which a C- or below is received are not accepted for credit toward the 55 credit hours and may have to be retaken. In this case, both grades are factored into the GPA. To withdraw from an elective course and receive a grade of W, a student must be earning a passing grade in that course. Students normally are not permitted to withdraw from courses after the sixth week of the semester. Students in the MBA program may not withdraw from specified, lock-step course work. An I is an incomplete grade. Use of the I is at the discretion of the course instructor and/or the dean. Students must ask for an incomplete grade. An I is given only when students, for reasons beyond their control, have been unable to complete course requirements. A substantial amount of work must have been satisfactorily completed before approval for such a grade is given.

Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
MBAC 6000	Socially Responsible Enterprise	3

MBAC 6030	Quantitative Methods (A Mod)	3
MBAC 6020	Financial Accounting (A Mod)	3
MBAC 6011	Managerial Economics 1 (A Mod)	1.5
MBAC 6098	Professional Development I (A Mod)	1
MBAC 6060	Corporate Finance (B Mod)	3
MBAC 6090	Marketing Management (B Mod)	3
MBAC 6099	Professional Development II (B Mod)	1.5
Credit Hours		19
Spring Semester		
MBAC 6080	Decision Modeling and Applications	3
Strategy		
Two Elective Courses		
MBAC 6012	Managerial Economics 2 (A Mod)	1.5
MBAC 6099	Professional Development II (continued)	1.5
Credit Hours		6
Summer		
Summer Internship Opportunities		
Credit Hours		0
Year Two		
Fall Semester		
Four Elective Courses ¹		
Credit Hours		0
Spring Semester		
Four Elective Courses ¹		
Credit Hours		0
Total Credit Hours		25

¹ For a list of approved MBA electives, download the Full-Time MBA Curriculum and Program Plan Guide (http://www.colorado.edu/business/sites/default/files/attached-files/mba_program_plan_final_2015docx.pdf).

Business Administration - Doctor of Philosophy (PhD)

The PhD program at the CU Boulder's Leeds School of Business prepares students for research and teaching careers at leading universities. The program focuses on developing the necessary skills for the design and

execution of original, innovative research and for the dissemination of knowledge through teaching and writing. Students gain a deep understanding of the most influential research in all academic business disciplines, as well as the tools needed to contribute state-of-the-art research advancing these disciplines:

- accounting
- finance
- marketing
- operations and information management
- strategic, organizational and entrepreneurial studies

The Leeds School of Business provides a dynamic professional atmosphere comprised of quality diverse faculty and doctoral students, all framed by a thriving business community and a beautiful environment.

Dr. Nathalie Moyen chairs the Doctoral Curriculum and Policy Committee.

Requirements

Students must complete all Graduate School, Leeds School of Business and division requirements to be conferred the PhD in business administration. For full-time status, the Leeds School of Business requires successful completion of 5 credit hours of course work each semester. During and after comprehensive exams, full-time status requires completion of a minimum of 5 dissertation credit hours each semester.

All doctoral students are required to complete at least 30 credit hours of course work and 30 credit hours of dissertation at CU Boulder. Additional course work may be required as determined by the academic advisor. To comply with this 30-credit-hour requirement, a course must be taught by a member of the university's graduate faculty, must be at the 5000 level or above, and the student must achieve a grade of B- or better.

Students are required to become proficient in their primary area of study. In addition, all students are required to complete course work in a field outside their division. These "second fields" are governed by the departments offering the course work, but typically require 6 to 12 credit hours. The second field may also require an additional preliminary or comprehensive exam.

Courses must be approved by the student's academic advisor before registration. Most students are required to complete 7000- and 8000-level doctoral seminars.

Time Limit

Doctoral students have six years from the commencement of course work to complete all requirements of the degree, but most students complete their program within five years.

Comprehensive Examination

Before admission to candidacy, a doctoral student must pass a comprehensive examination in the field of concentration. The examination may be oral, written or both, and will test the student's mastery of a broad field of knowledge, not merely the formal course work completed. Each division will determine the required content, length and standards of evaluation for the exam. Check with the division as to the specific requirements for the comprehensive exam.

Admission to Candidacy

Students are admitted to candidacy according to Graduate School procedures and requirements. Students shall complete all course work

and any other requirements listed on their degree plans, earn at least four semesters of residence and successfully pass the comprehensive exams before admission to candidacy is approved by the Graduate School. In addition, requirements related to academic quality of work, graduate-level course work, the minimum number of course credit hours, and graduate faculty membership must be met before admission to candidacy is approved.

Dissertation

A dissertation based upon original investigation showing mature scholarship and critical judgment, as well as competence with research tools and methods, must be written on a subject approved by the candidate's dissertation committee. To be acceptable, the dissertation must be a significant contribution to knowledge in the candidate's primary field.

Final Examination (Defense)

Upon recommendation of the candidate's doctoral dissertation committee, a final oral examination shall be given. This examination covers both the dissertation and the primary field of study. The oral examination is open to the public.

Filing the Dissertation

The dissertation must comply in mechanical features with the CU Boulder Graduate School Thesis and Dissertation Specifications. The dissertation must be filed with the Graduate School by the posted deadline for the semester in which the degree is to be conferred.

Business Analytics - Master of Science (MS)

The MS degree in business analytics focuses on the exciting and fast-growing field of "big data." Merging developments in marketing and customer analytics with operations research, business analytics, aspects of computer science and statistical methods, the specialization offers a technical, quantitative and statistically intensive program designed to train specialists in turning "big data" into business decisions. Analytics may be used as input for human decisions or may drive fully automated decisions about why some data pattern is observed, what will happen next and how a firm can adapt to optimize that outcome.

This nine-month program includes extensive course work and an application of materials, preparing students for a range of job opportunities. In addition to the academic course work, four enrichment seminars in topics ranging from teamwork and leadership to ethics and corporate social responsibility support our commitment to developing the "whole student" by incorporating professional development into the academic experience.

The experiential project pairs students with clients in industry to work on important practical problems in business analytics. Students work under the supervision of faculty and meet together weekly to discuss progress, jointly work on problems and to share experiences. This hands-on analytics project management experience prepares graduates to make an immediate meaningful contribution in the workplace.

Requirements

Required Courses and Semester Credit Hours

Course	Title	Credit Hours
Summer Review		
Admission to the program may recommend or require preparation or refresher courses in statistics, math and business		
	Credit Hours	0
August Intensive		
Survey of Business Analytics		3
	Credit Hours	3
Fall Semester		
Advanced Statistics Analysis		3
Data Analytics		3
Market Intelligence		3
Advanced Data Systems		3
Analytics Lab		3
	Credit Hours	15
Spring Semester		
Supervised Analytics Project		6
Elective ¹		3
Elective ¹		3
Elective ¹		3
	Credit Hours	15
	Total Credit Hours	33

¹ Electives offer variety within the specialization:

- Project Management
- Digital Marketing
- Decision Analysis
- Process Analytics
- Customer Analytics
- Supply Chain and Operations Analytic

Supervised Business Analytics Project

Based on an "action learning" model, the course is designed to provide hands-on analytics project management experience, amplified by shared experiences with other students. Exposes students to the multiple facets of business analytics at an executive level and integrates program coursework with this experience. While gaining first-hand experience, students are also adding value to the company by completing a project that draws on the skills gained through course work and educational experiences.

For additional information, please visit our website at www.colorado.edu/leedsms (<http://www.colorado.edu/leedsms>) or email us at leedsms@colorado.edu.

Finance - Master of Science (MS)

The 12-month MS in finance provides extensive course work and an in-depth application of materials, preparing students for a range of job opportunities. In addition to the course work, enrichment seminars in topics ranging from teamwork and leadership to ethics and corporate social responsibility support the "whole student" experience by incorporating professional development into the academic experience.

The focused finance curriculum offers students without a background in finance a firm grounding in general finance, and helps to develop the specific skills necessary to pursue careers in a variety of financial fields. The investment management track provides the skills necessary to pursue a career with an investment management firm and prepares students to take the CFA Level I exam. The corporate finance/consulting track prepares students for a career in management consulting, investment banking, private equity and venture capital.

For additional information, visit Leeds School's Colorado Master's Programs (<http://www.colorado.edu/business/ms-programs>) webpage or email us at leedsms@colorado.edu.

Requirements

Investment Management Track

Plan of Study

Course	Title	Credit Hours
Fall Semester		
Investment Management and Analysis		3
Derivative Securities		3
Markets, Institutions and Regulations		3
Fixed Income Investment		3
	Credit Hours	12
Spring Semester		
Financial Statement Analysis		3
Security Analysis and Valuation		3
Advanced Portfolio Management, choice of Applied Financial Management or International Financial Management		3
	Credit Hours	9
Summer		
Quantitative Methods		3
Managerial Economics		3
Financial Accounting		3
Corporate Finance		3
	Credit Hours	12
	Total Credit Hours	33

Corporate Finance/Consulting Track

Plan of Study

Course	Title	Credit Hours
Fall Semester		
Investment Management and Analysis		3
Derivative Securities		3
Markets, Institutions and Regulations		3
Fixed Income Investment		3
	Credit Hours	12
Spring Semester		
Financial Statement Analysis		3
Security Analysis and Valuation		3
Financial Strategy and Decision Modeling		3
Applied Financial Management		3
	Credit Hours	12
Summer		
Quantitative Methods		3

Managerial Economics	3
Financial Accounting	3
Corporate Finance	3
	Credit Hours
	12
	Total Credit Hours
	36

Real Estate - Master of Science (MS)

The MS in real estate provides an in-depth education for students interested in a career in the real estate industry. The 12-month program offers extensive course work and an application of materials, preparing students for a range of job opportunities. The program incorporates experiential learning and a multitude of opportunities for students to interact with industry leaders in classes and in events sponsored by the CU Real Estate Center.

The real estate curriculum includes a rigorous background in quantitative financial analysis and management, and specifically prepares students for careers in the financial, management and operations aspects of real estate. The program develops business skills so graduates can add value for their employers quickly.

Two specializations are offered:

- The development management option prepares students to become real estate development project managers.
- The asset management option prepares students for a variety of careers in real property asset and portfolio management.

Requirements

Applicants for the real estate track must have a minimum of two years' relevant work experience. For more information, visit Leeds School's Colorado Business Master's Programs (<http://www.colorado.edu/business/ms-programs>) webpage or email leedsms@colorado.edu.

Areas of Emphasis

Development Management Emphasis

Course	Title	Credit Hours
Fall Semester		
Real Estate Finance and Investments		3
Real Estate Economics		3
Real Estate Law and Practice		3
Construction Engineering & MGT Fundamentals		3
	Credit Hours	12
Spring Semester		
Design Development		3
Legal Aspects of Construction		3
Sustainable Real Estate		3
Real Estate Project Completion		3
	Credit Hours	12
Summer		
Quantitative Methods		3
Financial Accounting		3
Managerial Economics		3

Corporate Finance	3
Credit Hours	12
Total Credit Hours	36

Asset Management Emphasis

Course	Title	Credit Hours
Fall Semester		
Real Estate Finance and Investments		3
Real Estate Economics		3
Real Estate Law and Practice		3
Investment Management & Analysis		3
Credit Hours		12
Spring Semester		
Property/Asset/Portfolio Risk Management		3
Sustainable Real Estate		3
Financial Statement Analysis		3
Real Estate Project Completion		3
Credit Hours		12
Summer		
Quantitative Methods		3
Financial Accounting		3
Managerial Economics		3
Corporate Finance		3
Credit Hours		12
Total Credit Hours		36

Supply Chain Management - Master of Science (MS)

The MS in supply chain management provides an in-depth education in the specific area of supply chain management. This nine-month program includes extensive course work and an application of materials, preparing students for a range of job opportunities. In addition to the academic course work, four enrichment seminars in topics ranging from teamwork and leadership to ethics and corporate social responsibility support our commitment to developing the "whole student" by incorporating professional development into the academic experience.

Based on an "action learning" model, the program is designed to provide hands-on supply chain project management experience, amplified by shared experiences with other students. Exposes students to the multiple facets of supply chain management at an executive level and integrates program coursework with this experience. While gaining first-hand experience, students are also adding value to the company by completing a project that draws on the skills gained through course work and educational experiences.

The supply chain management curriculum includes the theory, tools and applied knowledge from quantitative, qualitative and managerial perspectives. Graduates will be prepared for responsible and influential jobs in a variety of organizations, including large manufacturing, retail and distribution organizations; transportation companies; supply chain software companies; and supply chain consulting firms.

A core required curriculum provides the common grounding within the discipline, while elective options and projects in a company setting develop individualization and specialization.

Requirements

For more information, visit the Leeds School's Colorado Business Master's Programs (<http://www.colorado.edu/business/ms-programs>) webpage or email leedsms@colorado.edu.

Plan of Study

Course	Title	Credit Hours
Summer Review		
Admission to the program may recommend or require preparation or refresher courses in statistics, math and business		
	Credit Hours	0
August Intensive		
Supply Chain Strategy		3
	Credit Hours	3
Fall Semester		
Transportation and Logistics		3
Procurement and Contracting		3
Advanced Data Systems		3
Data Analytics		3
Elective		3
	Credit Hours	15
Spring Semester		
Supervised Supply Chain Project		3
Supply Chain and Operations Analytics		3
Elective ¹		3
Elective ¹		3
	Credit Hours	12
Total Credit Hours		30

¹ Electives offer variety within the specialization:

- Project Management
- Decision Analysis
- Customer Analytics
- Process Analytics
- IT and Business Strategy
- Negotiations

Taxation - Master of Science (MS)

A master's degree in taxation prepares students to become financial professionals who can help a wide range of organizations thrive. Taxation is extremely important to any company because financial information, as analyzed and interpreted by CPAs, allows executives to make informed business decisions that help companies become more successful. Through our program, our graduates develop specific expertise in the area of taxation by strengthening and enhancing the ability to interpret and communicate information about a company's operations and finances. Academic experience, combined with a practical internship experience, propels our graduates to be proficient in the "language of business" that is taxation.

An MS in taxation primes graduates to become Certified Public Accountants (CPAs) both academically, in terms of preparing for the CPA exam, and by meeting the state of Colorado education requirements for CPAs (as well as those of most other states). For 2015, students from CU Boulder passed the CPA exam at a rate of 79 percent for first-time test takers, which was the number one ranking for schools in Colorado and 14th nationwide.

Requirements

The MS taxation degree consists of 10 graduate-level courses. Students can opt to take additional courses. The degree can be completed in 9–20 months, depending on whether the student wants, and is offered, a busy-season (spring) internship.

The following suggested course pathways are recommended based on a traditional starting date (fall semester), completion date (21 months), and undertaking a busy-season internship. Students can deviate from the suggested pathways depending on their personal timeline and experiences.

Prerequisites

Four intermediate-level accounting courses must be completed before starting the master's-level accounting courses.

ACCT 3220	Corporate Financial Reporting 1	3
ACCT 3230	Corporate Financial Reporting 2	3
ACCT 3320	Cost Management	3
ACCT 3440	Income Taxation of Individuals	3
Total Credit Hours		12

Requirements

Required Courses

ACCT 5450	Income Taxation of Business Entities	3
ACCT 5620	Auditing and Assurance Services	3
ACCT 6350	Current Issues in Professional Accounting-- Accounting Ethics	3
ACCT 6420	Research and Writing in Income Taxation	3
ACCT 6430	Taxation of Partnerships	3
ACCT 6450	Taxation of Corporations	3
ACCT 6620	Advanced Auditing: Business Risk and Decision Analysis	3
ACCT 6700	Income Taxation	4
BSLW 5120	Advanced Business Law	3

Electives (Select one)

ACCT 5240	Advanced Financial Accounting	3
ACCT 5250	Financial Statement Analysis	3
ACCT 5540	Accounting Information Systems	3
ACCT 5700	International Accounting	3
ACCT 5820	Topics in Business	3
ACCT 5827	Integrated Reporting for Socially Responsible Strategies	3
ACCT 5821	Experimental Seminar: Financial Report for Complex Transactions	3
ACCT 6900	Independent Study	3

Total Credit Hours 31

Education

The School of Education offers programs that prepare individuals to lead in a wide array of educational settings, including teaching in K–12 classrooms, conducting educational research, developing evidence-informed policy and designing innovative learning environments both in schools and in community-based settings.

Undergraduate students interested in K–6 Elementary Education may either pursue a Bachelor of Arts in Elementary Education (new for fall 2017) or complete the teacher licensure requirements while earning a bachelor's degree from another college on campus. The school also provides teacher licensure programs that ensure rigorous content preparation and extensive clinical experience in local partner schools. Teacher licensure programs are available at the undergraduate, post-baccalaureate and master's level. The School of Education collaborates with the College of Arts & Sciences, the College of Engineering and Applied Science, and the College of Music to design degree programs for undergraduates that combine a major in Arts & Sciences, Engineering and Applied Science, or Music with courses and field experiences in education that lead to a Colorado initial license.

The school offers a range of experiences and courses for undergraduates interested in educational issues, serving in the Peace Corps and/or working in community-based settings. Through the CU Engage Center, the school offers undergraduates opportunities to participate in community-based research and programs. Undergraduate students pursuing a major in the College of Arts and Sciences with a bachelor's degree in either Social Sciences or Arts and Humanities can apply for a dual degree with a Bachelor of Arts in Leadership and Community Engagement. This option is available to undergraduate students pursuing a Bachelor of Arts in Anthropology, Political Science, Sociology, Ethnic Studies, Women and Gender Studies, Geography, English, Jewish Studies, Philosophy, Spanish & Portuguese, and Asian Studies. In addition, the school offers two undergraduate minors, one in education and one in leadership.

Graduate programs in the school serve practicing teachers, higher education professionals, as well as those seeking to improve education through rigorous research and evidence-informed policy and practice. The school's doctoral program is a cohort-based, full-time program that prepares individuals to lead in universities, research or policy institutes, state or government agencies and innovative non-profit organizations.

Mission

The School of Education is dedicated to inspiring and preparing educators, researchers and policy makers who understand and further the democratic foundations of education, who are committed to social justice, who seek to bring about greater equity and access in education and who will draw upon evidence-informed policy and practice to improve the quality of education in both Colorado and the world.

Accreditation

The licensure programs, both undergraduate and graduate, are fully accredited by the North Central Association of Colleges and Schools, the Council for Accreditation of Educator Preparation, the Colorado Department of Education and the Colorado Commission on Higher Education.

Policies & Requirements

Admission

Prospective students seeking admission to a graduate degree program should view electronic application instructions and admission information on the School of Education Graduate Program (<http://www.colorado.edu/education/graduate-programs>) webpage. GRE test scores are required for admission to the doctoral programs. Applicants should request that the Educational Testing Service send their scores on the verbal reasoning, quantitative reasoning and analytical writing sections of the Graduate Record Examination (GRE) to CU Boulder's Graduate Processing Office.

Admission to all programs and degrees in the School of Education is selective. Meeting minimal admission requirements does not guarantee admission.

Application papers and all supporting documents, including GRE or Miller's Analogy Test (MAT) scores, if these scores are required for admission to the desired program, must be submitted electronically by the admission deadline. Master's admissions deadlines are September 1 for spring semester and January 10 for summer session and fall semester. The PhD deadline is December 1. The PhD program only has one admission cycle each year. The international student deadline for PhD applications is also December 1. Students should visit the International Admissions (<http://www.colorado.edu/international/international-admissions>) webpage for additional forms and information. The Secondary Master's Plus (MA+) application deadline is January 10.

Advising

Graduate students are assigned an individual faculty advisor after admission and are required to submit a formal plan of study, approved by their advisor, before the end of the first full year of study. Graduate students may obtain program information from the School of Education, Office of Student Services, or from their faculty advisors.

Maximum Load and Part-Time Study

A maximum of 15 credit hours in any one semester may be applied toward degree requirements. During the summer, 9 credit hours is the maximum that will be counted toward education graduate degrees. Within this limit, students may take up to 6 credit hours in a five-week summer term, and/or 3 credit hours in a three-week term. During the academic year for financial aid purposes, students will be regarded as having a full load if they are registered for 5 or more credit hours in courses numbered 5000 or above, or are registered in a minimum of 5 dissertation or 1 MA thesis hour. At least four semesters of residence credit hours, two of which must be consecutive in one academic year, must be earned for work taken at CU Boulder. See the Graduate School section for clarification.

Quality of Work

A grade average of B (3.00) or better is required for all work taken for any graduate degree. Transferred credits are not included when calculating grade averages.

A mark below B- will not be credited toward the PhD program; a mark below C is not acceptable for MA students. Any graduate course in which a mark of D or F is reported as failed and must be repeated and passed if it is required in a student's degree program. Students who do not maintain at least a B (3.00) average or better may be suspended by the

dean of the Graduate School upon the recommendation of the associate dean of graduate studies in the School of Education. Students may also be suspended from the Graduate School for continued failure to maintain satisfactory progress toward the degree sought.

Opportunities for Assistantships

The School of Education has a limited number of assistantships administered by the dean on the recommendations of faculty and the associate dean for Teacher Education or associate dean for graduate studies. Some assistantships involve the supervision of student teachers; others involve helping professors in their teaching or research. Taxable stipends in amounts set by the university are paid for all assistantships. Appointments are usually made in terms of one-fourth time (10 hours a week) or one-half time (20 hours a week). Inquiries should be directed to the associate dean for graduate studies.

Master of Arts in Education

The master of arts degree requires one academic year or more of graduate work beyond the bachelor's degree.

The master's degree must be completed within four years of initial enrollment. The MA plan II (nonthesis) degree requires a minimum of 30 credit hours. See the *Graduate School* section for discussion of *plan I* and *plan II*. Students may transfer no more than 9 credit hours of work taken at another institution or as a nondegree student at CU Boulder.

All program areas have outlined a recommended or required program of study, and students pursuing a degree are expected to follow that program unless they have appropriate substitutions arranged in advance with their advisors and the associate dean for graduate studies.

At the beginning of the final term of study, each student must submit a "Candidacy Application for an Advanced Degree." These forms are available online through the Graduate School (http://www.colorado.edu/graduateschool/sites/default/files/attached-files/candap_0.pdf). If a minor is included, the form must first be signed by a representative of the student's minor department or program area. The form must be signed by the student and the student's faculty advisor, and then submitted to the school's Office of Student Services for School of Education approval and then to the Graduate School for final approval. All students are required to pass a comprehensive-final examination or its equivalent, as determined by the program's faculty committee. (For time limits and other information, see the Graduate School section under Master's Degree.)

Scholarships and Awards

A limited number of scholarships and awards are available for second- and third-year students within the School of Education to support study at the master's and undergraduate levels. Each year a combination of teaching assistantships (TAs), research assistantships (RAs), other forms of graduate assistantships (GAs) and fellowships are available in the School of Education to support full-time doctoral study. The strongest doctoral applicants are nominated by the school for fellowships awarded by the Graduate School. Candidates apply in the spring semester for scholarships and awards for the following school year. Application procedures and deadlines are publicized on the School of Education website.

Students are eligible to apply for university-wide financial assistance through the Office of Financial Aid. State and federal programs are available for loan cancellation or forgiveness for Colorado teachers of

certain subjects or who teach in designated schools serving students from low-income families. Information about these opportunities may be found on the School of Education (<http://www.colorado.edu/education>) website.

Upon enrollment in the Teacher Education Program, a student who fails to maintain a 2.75 GPA (3.00 for graduate students) will be placed on probation or may be suspended. Readmission is subject to program requirements in effect at the time of reapplication. The same conditions apply to students in other colleges and schools who have been admitted to the teacher education program.

Programs of Special Interest

Graduate Students of Color Collaborative

The Graduate Students of Color Collaborative (GSCC) is a collective that strives to create and promote safe spaces for graduate students of color in the School of Education and across campus. In recognizing the unique challenges and isolation students of color often face in graduate programs at CU, GSCC aims to regularly offer social gatherings, opportunities to critically reflect and engage in discussions of race as it pertains to campus climate, as well as a formal presence representing graduate students in diversity initiatives across campus. In addition GSCC members seek to collaborate with other cultural, equity and diversity based organizations on campus and graduate student support structures ranging from first-year student community support to dissertation writing groups.

Programs of Study

Graduate study in education at CU Boulder is administered through the Office of Student Services, School of Education, and all inquiries regarding programs should be directed to the contact address at the right.

Detailed program information is available on the school's Graduate Programs (<http://www.colorado.edu/education/graduate-programs>) website. Students should also obtain and read the School of Education Graduate Student Handbook (<http://www.colorado.edu/education/current-students/graduate-students>).

Degree Programs

The degrees available in the various areas of graduate study are listed below. CU Boulder does not offer programs in early childhood education, physical education, art education, counseling, school administration, school psychology or educational technology.

Curriculum and Instruction

K–12 humanities education, K–12 mathematics and science education, K–12 literacy education and research on teaching & teacher education.

- Master of Arts
- Doctor of Philosophy
- Secondary Master's Plus (MA+) Licensure Programs

CU Boulder offers special programs for prospective secondary teachers that combine a master of arts degree in curriculum and instruction in a content area and teacher licensure to qualified students already holding bachelor's degrees. Admission is highly competitive, and program completion requires a two-year commitment of course work and school placements. Students in the MA+ programs become eligible

for a Colorado teaching license after three semesters; they complete remaining course work for the master's degree in the fourth semester. Applicants must meet all graduate requirements listed below and undergo an extensive screening process. This program admits students for fall semester only. Complete program information is available in the Office of Student Services (Education 151) or by calling 303-492-6555.

Educational Equity & Cultural Diversity

Culturally & Linguistically Diverse Education, Dual Culturally & Linguistically Diverse Ed with Special Ed Generalist and Social/Multicultural/Bilingual Education.

- Master of Arts
- Doctor of Philosophy

Education Foundations, Policy & Practice

- Master of Arts
- Doctor of Philosophy

Learning Sciences & Human Development

- Master of Arts
- Doctor of Philosophy

Research and Evaluation Methodology

Methods of educational research and evaluation, including statistics, measurement and qualitative methods.

- Doctor of Philosophy

BA/MA in Ethnic Studies and Education

Teaching Endorsements at the Graduate Level

Through the School of Education (and in conjunction with other departments), CU Boulder offers advanced course work leading to graduate level teaching and special services training in the following areas:

- Culturally and linguistically diverse education (grades K–12)
- Culturally and linguistically diverse education specialist: bilingual education (grades K–12)
- Reading teacher (grades K–12)
- Special education generalist (grades K–12)
- Special education specialist (grades K–12)
- Special services (offered through SLHS): audiologist (ages 0–21); speech/language pathologist (ages 0–21)

All of the above programs have degree, licensure or experience requirements that must be fulfilled before admission. Please check with the department before applying.

Graduate programs combining the MA and secondary teacher licensure are also available.

Accreditation

The licensure programs, both undergraduate and graduate, are fully accredited by the North Central Association of Colleges and Schools, the Council for Accreditation of Educator Preparation, the Colorado Department of Education and the Colorado Commission on Higher Education.

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aiken, Ellen (https://experts.colorado.edu/display/fisid_103974)
PhD, University of Colorado Boulder

Anderson, Ronald
Professor Emeritus

Andrew, Julie Ann (https://experts.colorado.edu/display/fisid_148635)
Instructor; MEd, Univ of New South Wales (Australia)

Atteberry, Allison (https://experts.colorado.edu/display/fisid_154598)
Assistant Professor; PhD, Stanford University

Begley, Donna M (https://experts.colorado.edu/display/fisid_131000)
Senior Instructor

Boardman, Alison Gould (https://experts.colorado.edu/display/fisid_141887)
Asst Research Professor; PhD, University of Texas at Austin

Briggs, Derek Christian Mauthner (https://experts.colorado.edu/display/fisid_129597)
Professor; PhD, University of California-Berkeley

Bullington, Sam N (https://experts.colorado.edu/display/fisid_152528)
Lecturer

Cline, Ruth
Professor Emeritus

Dalton, Bridget Monroe (https://experts.colorado.edu/display/fisid_151711)
Associate Professor; EdD, Harvard University

Donato, Ruben (https://experts.colorado.edu/display/fisid_105537)
Professor; PhD, Stanford University

Dutro, Elizabeth (https://experts.colorado.edu/display/fisid_141157)
Professor; PhD, University of Michigan Ann Arbor

Escamilla, Kathy M (https://experts.colorado.edu/display/fisid_109224)
Professor; PhD, University of California-Los Angeles

Flexer, Roberta
Professor Emeritus

Furtak, Erin M (https://experts.colorado.edu/display/fisid_144504)
Associate Professor; PhD, Stanford University

Glass, Gene V (https://experts.colorado.edu/display/fisid_149833)
Research Professor; PhD, University of Wisconsin-Madison

Haas, John
Professor Emeritus

Hand, Victoria (https://experts.colorado.edu/display/fisid_144609)
Associate Professor; PhD, Stanford University

Hodge, Stephen
Professor Emeritus

Hoover, John J (https://experts.colorado.edu/display/fisid_113520)
Assoc Research Professor; PhD, University of Colorado Boulder

Hopewell, Susan Walsh (https://experts.colorado.edu/display/fisid_145039)
Assistant Professor; PhD, University of Colorado Boulder

Hopkins, Kenneth
Professor Emeritus

House, Ernie
Professor Emeritus

Jurow, Aachey Susan (https://experts.colorado.edu/display/fisid_129478)
Associate Professor; PhD, University of California-Berkeley

Kirshner, Benjamin R (https://experts.colorado.edu/display/fisid_134707)
Associate Professor; PhD, Stanford University

Kraft, Richard
Professor Emeritus

Lecompte, Margaret D.
Professor Emeritus

Linn, Robert L.
Professor Emeritus

Liston, Daniel P (https://experts.colorado.edu/display/fisid_102033)
Professor; PhD, University of Wisconsin-Madison

Lopez, Enrique J (https://experts.colorado.edu/display/fisid_151426)
Assistant Professor; PhD, Stanford University

McGinley, William (https://experts.colorado.edu/display/fisid_102195)
Associate Professor; PhD, University of Illinois at Urbana-Champaign

McWilliams, Jenna Marie (https://experts.colorado.edu/display/fisid_155195)
Lecturer

Meens, David Eric (https://experts.colorado.edu/display/fisid_145241)
Lecturer

Meyer, Elizabeth Jackson (https://experts.colorado.edu/display/fisid_156354)
Associate Professor; PhD, McGill Univ (Canada)

Molnar, Alex John (https://experts.colorado.edu/display/fisid_148836)
Research Professor; MSW, University of Wisconsin-Milwaukee

Moses, Michele s (https://experts.colorado.edu/display/fisid_141025)
Professor; PhD, University of Colorado Boulder

Nogueron-Liu, Silvia (https://experts.colorado.edu/display/fisid_155783)
Assistant Professor; PhD, Arizona State University

O'Connor, Kevin C (https://experts.colorado.edu/display/fisid_148490)
Assistant Professor; PhD, Clark University

Otero, Valerie K (https://experts.colorado.edu/display/fisid_118377)
Professor; PhD, University of California-San Diego

Penuel, William Richard (https://experts.colorado.edu/display/fisid_149719)
Professor; PhD, Clark University

Polman, Joseph Louis (https://experts.colorado.edu/display/fisid_151296)
Professor; PhD, Northwestern University

Ramirez, Karen E. (https://experts.colorado.edu/display/fisid_116951)
Instructor; PhD, University of Illinois at Urbana-Champaign

Shapiro, Ryan Benjamin (https://experts.colorado.edu/display/fisid_156418)
Assistant Professor; PhD, Northwestern University

Shepard, Lorrie A (https://experts.colorado.edu/display/fisid_105949)
Distinguished Professor; PhD, University of Colorado Boulder

Sideris, Sabrina C (https://experts.colorado.edu/display/fisid_120493)

Soltero-Gonzalez, Lucinda A (https://experts.colorado.edu/display/fisid_144617)
Lecturer; PhD, University of Arizona

Stillman, Jamy A (https://experts.colorado.edu/display/fisid_156381)
Associate Professor; PhD, University of California-Los Angeles

Taylor, Edward Vincent (https://experts.colorado.edu/display/fisid_151510)
Assistant Professor; PhD, University of California-Berkeley

Webb, David C. (https://experts.colorado.edu/display/fisid_141204)
Associate Professor; PhD, University of Wisconsin-Madison

Welner, Kevin G (https://experts.colorado.edu/display/fisid_115565)
Professor; PhD, University of California-Los Angeles

White, Terrenda Corisa (https://experts.colorado.edu/display/fisid_152828)
Assistant Professor; PhD, Teachers College at Columbia University

Willmann, Kent D (https://experts.colorado.edu/display/fisid_148075)
Instructor

Wilson, Terri Suzanne (https://experts.colorado.edu/display/fisid_155469)
Assistant Professor; PhD, Columbia University Central office

Courses

EDUC 5005 (3) Advanced Social Foundations of Education

Critically examines the intellectual and political forces that shape the aims, policies, and practices of K-12 education in the United States.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5015 (3) International / Comparative Education

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace Corps and Volunteer Agencies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4015

Additional Information: Departmental Category: Graduate Education

EDUC 5035 (3) Proseminar: Parent and Community Involvement

Focuses on models and strategies for improving parent and community involvement in the schools. Discusses administrative concerns, such as parent advisory councils, and instructional concerns, such as helping children with school assignments.

Additional Information: Departmental Category: Graduate Education

EDUC 5060 (3) Classroom Interactions

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts.

Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4060

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5065 (3) Curriculum Theories

Examines four central curricular traditions: progressive; conservative; radical; and spiritual. Highlights the strengths and weaknesses of various writers within each tradition with attention paid to the conceptual features and the practical implications of each educational view.

Encourages students to examine their own educational assumptions.

Additional Information: Departmental Category: Graduate Education

EDUC 5070 (3) Spirituality and Religion in Education

Examines features of religion, spirituality, and a liberal arts education, so as to further understand the constitutional, historical and cultural constraints on, and acceptable approaches to the study of religion and spirituality in American education. Specifically explores aspects of a contemplative orientation and the degree to which such an orientation should/can be pursued in K-12 public and higher education.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5075 (3) Sociology in Education

In-depth analysis of theories and concepts in sociology and education. Evolution of curriculum, organization, and enrollment characteristics of American schools. Schooling, race, class, culture, gender, stratification, and educational reform in light of paradigmatic change in theories and concepts of sociology.

Additional Information: Departmental Category: Graduate Education

EDUC 5085 (3) History of American Education

Highlights social and intellectual history perspectives of American educational history, major reform movements from the 19th century to Dewey, and assessment of how differences of race, class, ethnicity, religion, power, and gender affected American education.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5105 (3) Teaching for Understanding and Equity

Addresses perspectives and evidence-based teaching practices that promote equity and access to conceptual understanding. Introduces the knowledge base on effective and socially just teaching practices, and the theories and research that support these practices. Explores the impact of theory and research on classroom instruction.

Additional Information: Departmental Category: Graduate Education

EDUC 5115 (3) Issues in School Change and Reform

Examines recent developments in teaching, and trends in the philosophy and practice of education. Focuses special attention on a variety of issues central to school reform.

Additional Information: Departmental Category: Graduate Education

EDUC 5135 (3) Story and Memoir

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4135

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5145 (3) Gender, Literacy, and the K-12 Classroom

Explores and critiques various conceptions of gender within popular and scholarly publications that have influenced how gender and sexual diversity is approached in classrooms. Builds a theoretical stance toward gender and sexual diversity that supports equity, engagement and achievement for all children and youth. Discusses teaching strategies that thoughtfully take into account gender identities and equity.

Additional Information: Departmental Category: Graduate Education

EDUC 5165 (3) Children's Literature

Involves reading and evaluation of picture books, and emphasizes children's interests, authors and illustrators, multicultural literature, the components of narrative, and the features of illustrations. Examines connections between children's literature and children's development as writers.

Additional Information: Departmental Category: Graduate Education

EDUC 5205 (3) Elementary Mathematics Theory and Methods

Provides pre-service teachers opportunities to explore contemporary theories of learning, curriculum development, and pedagogical strategies pertaining to teaching elementary-level mathematics. Blends exploration in mathematical content with development of sophisticated mathematical models for teaching.

Requisites: Requires corequisite course of EDUC 4351. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 5215 (3) Elementary Science Theory and Methods

Provides pre-service elementary teachers opportunities to explore contemporary theories of learning, curriculum development, pedagogical strategies, and assessment. Blends scientific content, pedagogy, and practical applications.

Requisites: Requires corequisite courses of EDUC 4331 and 4341. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 5222 (3) Language Study for Educators

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4222

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5235 (3) Language and Literacy Across the Curriculum

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4232

Requisites: Restricted to EDCI, EECD, EFPP, EPSY or REME graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5245 (3) Foundations of Reading Instruction K-12

Comparatively analyzes current and emerging philosophies and programs in K-12 with focus on teaching reading and thinking skills.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5255 (3) Digital Literacies and New Media

Engage in digital reading and writing experiences using tools for communication, collaboration, design and research. Students will discuss and critically reflect on the role of technology in literacy instruction, grounded on learning and literacy theories. Connections to English language arts include genre study of literary and nonfiction texts and using quality children's literature as mentor texts for multimodal craft.

Requisites: Requires a prerequisite course of EDUC 5245 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Education

EDUC 5265 (3) Processes in Writing

Examines processes writers use from early ages to maturity by investigating current research related to writing curriculum, instruction, and policy. Includes opportunities for students to engage in inquiry related to writing curriculum and instruction in K-12 classrooms.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5275 (3) Assessment in Literacy

Assumes an interactive model of reading and supports the perspective of assessment as interrelated with curriculum and instruction; examines principles that guide the selection and interpretation of assessment strategies and tools, with a focus on students who are experiencing difficulties with literacy.

Requisites: Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5285 (3) Reading Clinic Procedures K-12

Focuses learning on a select group of K-12 students to assess reading proficiency, develop appropriate instructional goals, and provide instruction that addresses these goals. Emphasis on interpreting assessment data, extending a repertoire of instructional strategies, and developing and implementing a strong instructional plan.

Requisites: Requires a prerequisite course of EDUC 5275 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5295 (4) Reading and Literacy in the Secondary Classroom

Examines ways in which adolescents develop literacy through reading, writing, speaking, viewing and listening. Students learn to plan and organize literacy instruction based on ongoing assessment, to draw on and develop learner's linguistic skills related to reading, to support learner's reading comprehension skills and to support their learning through oral language development. Includes a school-based practicum experience.

Requisites: Requires a corequisite course of EDUC 4342 or EDUC 5345. Restricted to EDCI majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5315 (3) Perspectives on Science

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4312

Additional Information: Departmental Category: Graduate Education

EDUC 5316 (3) Nature of Social Studies and Social Studies Education

Prepares teacher education candidates for teaching social studies in a social context. Participants will understand theoretical and developmental processes associated with social studies learning, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI), Social Studies-Secondary Educ. (EDSS), Anthropology (ANTH), Economics (ECON), Geography (GEOG), History (HIST) or International Affairs (IAFS) majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5317 (3) Perspectives on Mathematics

Explores the historical development of mathematics as a human construct, and the relationship between the discipline and the contemporary school mathematics curriculum. Focuses on the sociology of mathematics education and how cultural traditions and societal needs influence the school mathematics curriculum and educational practice.

Additional Information: Departmental Category: Graduate Education

EDUC 5318 (3) The Nature of "English Language Arts"

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for the 21st century literacies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4318

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5325 (3) Teaching Literature in Middle and Secondary Schools

Provides teachers of English with background and experiences relevant to using reading, writing, and a range of other classroom social languages to teach literature to a culturally and intellectually diverse population of students. Explores relevant literary theories, texts, and genres, and examines contemporary and historical perspectives on the meaning and function of stories in both personal and democratic public life.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI), English - Secondary Education (EDEN), or Social Studies-Secondary Educ.(EDSS) majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5345 (4) Writing in Humanities Classrooms

Fosters understandings of diverse students' writing processes and the development of a repertoire of research-based teaching practices. Emphasizes writing as a tool for both developing and communicating understandings across a range of settings.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4342

Requisites: Requires a corequisite course of EDUC 4295 or EDUC 5295. Restricted to EDCI majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5355 (3-4) Methods and Materials in Secondary Social Studies

Focuses on curriculum, materials, methods, assessment, and related aspects of instruction. Introduces best practices in teaching the social studies in middle and high schools. Examines the Colorado Academic Content Standards.

Requisites: Requires a prerequisite course of EDUC 4295 or EDUC 5295 and EDUC 5325 (all minimum grade C-). Restricted to Educ-Curriculum Instruction (EDCI) or Social Studies-Secondary Educ (EDSS) majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5365 (3-4) Methods and Materials in Secondary English

Focuses on curriculum, materials, methods, and assessment. Introduces best practices in the teaching of English in middle and high schools. Examines the Colorado Academic Content Standards.

Requisites: Requires a prerequisite course of EDUC 4295 or EDUC 5295 and EDUC 5325 (all minimum grade C-). Restricted to Educ-Curriculum Instruction (EDCI) or English - Secondary Education (EDEN) majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5375 (3-4) Problem-Based Math Instruction

Focuses on curriculum, materials, methods and assessment, and related aspects of instruction. Introduces best practices in teaching mathematics in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

Requisites: Restricted to EDCI, EDSC, or EDMA majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5385 (3-4) Problem-Based Science Instruction

Focuses on curriculum, materials, methods, assessment, and related aspects of instruction. Introduces best practices in teaching science in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

Requisites: Restricted to EDCI, EDSC, or EDMA majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5425 (3) Introduction to Bilingual/Multicultural Education

Provides a comprehensive survey of bilingual-multicultural education programs for language minority students. Includes an overview of the history and legislation related to bilingual education and English as a second language. Presents various models, philosophies, and theoretical underpinnings of bilingual education and ESL.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4425

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5435 (3) Materials and Methods in Bilingual/ Multicultural Education

Provides an in-depth study of the curriculum options available for bilingual and ESL programs. Presents, reviews, and critiques specific methods and strategies for teaching language to minority students. Gives the opportunity to develop and present teaching units in Spanish or in ESL methodology, as appropriate.

Requisites: Requires a prerequisite course of EDUC 5425 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5445 (3) Curriculum for Multicultural Education

Analyzes curriculum programs and examines principles that inform innovation for education of diverse students at all school levels. Includes topics of ethnic, racial, socio-economic, linguistic, and gender diversity.

Additional Information: Departmental Category: Graduate Education

EDUC 5455 (3) Literacy for Linguistically Different Learners

Presents current and emerging philosophies and methods on teaching reading to culturally diverse second-language learners. Includes review of materials, strategies for teaching reading and writing skills, and important considerations for transference from L1 to L2 reading.

Requisites: Requires a prerequisite course of EDUC 5425 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4460 and PHYS 4460 and PHYS 5460

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5465 (3) Introduction to ESL/Bilingual and Special Education

Provides students with the fundamental information of ESL, bilingual and special education, including theories, assumptions, philosophies, and paradigms of bilingual and special education. Discusses successful teaching techniques and instructional approaches, including individualization, least restrictive environment, transition, and career education.

Additional Information: Departmental Category: Graduate Education

EDUC 5485 (3) Differentiation in the Classroom

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices, programmatic interventions that support student learning and using research to inform practice. Includes practicum. Department enforced prerequisite: restricted to MA+ students.

Additional Information: Departmental Category: Graduate Education

EDUC 5505 (3) Education of Students with Learning and Behavior Disorders

Discusses unique learning needs of students with learning and behavior disorders. Emphasizes development of a systems model for diagnosis, programming, and remediation. Stresses data-based individualization of instruction, with emphasis on intervention in inclusive learning environments and developing a culturally responsive system.

Additional Information: Departmental Category: Graduate Education

EDUC 5515 (3) Curriculum and Assessment for Special Learners

Emphasizes assessment of special education students from pre-referral through staffing and placement, including response to intervention, research-based assessment practices, analytic teaching and assessment, curriculum-based assessment and measurement. Selection, administration, and interpretation of formal and informal assessment devices are studied, with particular emphasis on cultural relevance and equity in assessment for special learners with mild to severe needs.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5525 (3) Research Issues in Special Education

Provides practical experience in the review, critique, conceptualization, and writing of research studies in special education. Also offers experience in design of evaluation systems for classroom practice.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5535 (3) Diagnostic Testing in ESL and Bilingual Education

Promotes critical uses of assessment instruments and information. Provides methods for educators to incorporate assessment as a meaningful activity in the classroom intended to support learning among bilingual students. Examines effectiveness, validity, and fairness in the testing of linguistically diverse populations. Provides first-hand experiences developing, selecting, reviewing, and adapting test materials as critical to making informed teaching decisions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5545 (3) Strategies for Teaching Students with Special Needs

Provides teachers with specific evidence-based methods and techniques for teaching students with a wide variety of high and low disabilities including learning and language disabilities, hearing and visual impairments, physical disabilities, and health impairments. Emphasizes different teaching methods, instructional materials, and learning strategies that have proven effective working students with cognitive learning needs.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5555 (3-4) Practicum in Bilingual/Special Education

Offers supervised field experience in elementary and secondary special education class settings. Each credit hour requires 50 contact hours.

Requisites: Requires prerequisite courses of EDUC 5465 and EDUC 5505 and EDUC 5515 or EDUC 5545 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5575 (1-4) Workshop in Curriculum and Instruction

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 5580 (3) Physics and Everyday Thinking

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

Additional Information: Departmental Category: Graduate Education

EDUC 5595 (1-4) Practicum in Linguistically Different: English as a Second Language

University supervised, school-based field experience teaching linguistically different students, as well as assistance in the completion of EECD portfolio.

Requisites: Requires prerequisite courses of EDUC 5425 and EDUC 5435 and EDUC 5535 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5605 (3) Research Issues in Bilingual Education

Offers practical experience in the review, critique, conceptualization, and writing of research studies in bilingual/ESL education. Provides experience in the design of classroom evaluation systems.

Requisites: Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5610 (1-3) Math and Science Education

Introduces learning theory and teaching practices for mathematics and science learning assistants. Presents theoretical issues such as conceptual development, questioning techniques, cooperative learning, nature of math/science, and argumentation in mathematics and science.

Additional Information: Departmental Category: Graduate Education

EDUC 5615 (3) Second Language Acquisition

Presents a broad survey of second-language acquisition research. Stresses theoretical concerns and research findings and practical applications to teaching second languages. Gives special emphasis to second-language acquisition.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5625 (3) Methods of Teaching English as a Second Language

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

Recommended: Prerequisite EDUC 5615.

Additional Information: Departmental Category: Graduate Education

EDUC 5635 (3) Education and Sociolinguistics

Explores the discipline of sociolinguistics, the study of language variation and use, and its application within education settings. Not designed as an advanced sociology or linguistics course. Areas of study include language variation, speech communities, the ethnography of communication, speech and social identities, and sociolinguistic research related to teaching and learning.

Additional Information: Departmental Category: Graduate Education

EDUC 5706 (3) Assessment in Mathematics and Science Education

Examines purposes and practices of assessment in mathematics and science education. Particular attention is given to application of theoretical foundations and contemporary research in the design and use of assessment techniques and tools to support teaching for student understanding. Addresses the role of effective formative assessment in teaching and learning.

Additional Information: Departmental Category: Graduate Education

EDUC 5716 (3) Basic Statistical Methods

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5726 (3) Introduction to Disciplined Inquiry

Considers various research approaches and methodologies included in education including experimental and quasi-experimental methods; anthropological and case study methods; evaluative research and field studies; correlational; and sociological, historical, and philosophical research. Topics include library research, research criticism, research design, and proposal writing.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5810 (3) Teaching K-12 Mathematics: Number Sense

Provides teachers opportunity to explore fundamental mathematical theories and pedagogical perspectives pertaining to the teaching and learning of number and operation. Engages students in explorations of mathematical content underlying number and operations, while highlighting relevant problem solving, reasoning and proof, and mathematical connections. Explores implications of teachers' mathematical learning on their classroom teaching. Develops practices supporting learner's number sense development.

Additional Information: Departmental Category: Graduate Education

EDUC 5820 (3) Teaching K-12 Mathematics: Algebraic Thinking

Uses reform-based mathematics curricula to engage participants in algebraic thinking, to reflect on their own knowledge of algebraic concepts, and to examine pedagogical ideas that can foster K-12 students' algebraic thinking and learning. Algebraic topics include patterning, variable, functions, multiple representations, equality, and solving linear and systems of equations.

Additional Information: Departmental Category: Graduate Education

EDUC 5822 (3) Teaching and Learning Chemistry

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

Requisites: Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5830 (3) Teaching K-12 Mathematics: Geometry & Measurement

Provides an opportunity to explore how to foster geometric thinking while examining fundamental mathematical theory underlying the content area of geometry and measurement. Emphasizes investigative approach involving problem solving, reasoning, connections, and communication as well as learning mathematics content in a flexible and conceptual way. Challenges participants to apply their understanding to teaching practices that foster geometric thinking in K-12 learners.

Additional Information: Departmental Category: Graduate Education

EDUC 5833 (3) Teaching and Learning Earth Systems

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). The course focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions and developing effective discourse within and outside the classroom.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Education

EDUC 5840 (3) Teaching K-12 Mathematics: Probability & Statistics

Focuses on teaching probability, data analysis, and statistics in K-12 classrooms. Explores curriculum and assessment strategies in the areas of probability and statistics. Examines research on students' thinking on stochastic tasks and how this research informs teaching practice. Emphasizes deepening of one's conceptual understanding of probability and statistics and their importance in the current information age.

Additional Information: Departmental Category: Graduate Education

EDUC 6210 (3) Education Policy and the Law

Approaches education policy issues through the rich history of litigation and current legal challenges facing American K-12 schooling. Builds an understanding of the legal and policy development of the American schooling system, particularly in the 20th century. Laws and legal cases will be used as jumping-off points for broader discussions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6220 (3) Gender Issues in Education

Provides a strong foundation in the various issues of gender and sexual diversity in education. Stimulates explorations into the ways the construct of "gender" affects and is affected by the educational system and process. Presents theory and research about contemporary educational issues related to sexism and homophobia. Encourages development of well-considered views about the various issues, research, and theories.

Additional Information: Departmental Category: Graduate Education

EDUC 6230 (3) Ethics in Education

Investigates controversies in education from a self-consciously ethical perspective, drawing as appropriate from moral and political theory as well as law. Focuses on public education's role in fostering democratic citizenship and providing equal educational opportunity. Critically evaluates various education reform policies and curriculum policies. Applies method commonly used in medical ethics to make decisions regarding concrete ethically problematic cases.

Additional Information: Departmental Category: Graduate Education

EDUC 6250 (3) Higher Education in the United States

Examines major issues in higher education focusing on the sociopolitical contexts in which US universities operate as gatekeepers to opportunities. Topics include the purposes and history of higher education in the United States, college teaching and learning, finance and governance, issues of access and equity related to race, gender, sexual orientation, gender identity, immigration status and class, and student life.

Grading Basis: Letter Grade

EDUC 6318 (3) Psychological Foundations of Education

Introduces students to theoretical and empirical contributions of educational and developmental psychology and the learning sciences emphasizing applications to educational practices. Topics include learning, development, cognitive processes, social and cultural context, motivation, assessment and individual differences.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6325 (3) Culture and Ethnography in Education

Applies anthropological perspectives to research in educational settings. Focuses on theories of culture, cultural transmission and acquisition, and cultural reproduction and production for understanding schooling and its outcomes.

Additional Information: Departmental Category: Graduate Education

EDUC 6328 (3) Advanced Child Growth and Educational Development

Introduces students to recent theoretical and research advances in the study of children and adolescent's cognitive, social and emotional development, with an emphasis on implications for learning in and out of school.

Additional Information: Departmental Category: Graduate Education

EDUC 6368 (3) Adolescent Psychology and Development for Teachers

Examines current theory and research on adolescent development, learning, motivation, and academic achievement. Emphasizes how theory and research can inform instructional decisions in the secondary classroom.

Requisites: Restricted to English-Secondary Education (EDEN), Social Studies-Secondary Educ (EDSS), Mathematics-Secondary Educ (EDMA) or Science-Secondary Educ (EDSC) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6504 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Department enforced prerequisite: graduate standing or at least one upper-division course in computer science, linguistics, philosophy, or psychology.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6505 (1-2) Readings and Research in Cognitive Science

Interdisciplinary reading of innovative theories and methodologies of cognitive science. Share interdisciplinary perspectives through in-class and online discussion and analysis of controversial texts and of their own research in cognitive science. Required for joint PhD in cognitive science.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6506 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

Requisites: Requires prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-). Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

Additional Information: Departmental Category: Graduate Education

EDUC 6516 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

Requisites: Requires prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6804 (1-4) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4811 and MCDB 4811 and MCDB 5811

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6844 (1-4) Master's Independent Study

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6855 (1-4) Independent Study in Curriculum and Instruction---Master's Level

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6877 (1-4) Independent Study in Educational Equity & Cultural Diversity: Master's Level

An independent study may be established between a student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6888 (1-4) Independent Study in Educational and Psychological Studies---Master's Level

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6899 (1-4) Independent Study in Educational Foundations Policy & Practice--Master's Level

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6915 (1-4) Practicum in Curriculum and Instruction

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6916 (1-4) Practicum in Research and Evaluation Methodology

Additional Information: Departmental Category: Graduate Education

EDUC 6917 (1-4) Practicum in Educational Equity and Cultural Diversity

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6918 (1-4) Practicum in Educational and Psychological Studies

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6919 (1-4) Practicum in Educational Foundations Policy and Practice

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6925 (1-4) Readings in Curriculum and Instruction

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6926 (1-4) Readings in Research and Evaluation Methodology

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6927 (1-4) Readings in Educational Equity and Cultural Diversity

Five times per semester our faculty and PhD students gather to explore topics that are relevant to becoming a scholar and researcher in our field. All EECDD PhD students are encouraged to attend; however, for first and second year PhD students attendance is required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6928 (1-4) Readings in Educational and Psychological Studies

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6929 (1-4) Readings in Educational Foundations Policy and Practice

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6944 (1-3) Master's Degree Candidate

Repeatable: Repeatable for up to 12.00 total credit hours.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Graduate Education

EDUC 6954 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 6964 (3) Capstone: Inquiry in the Content Areas

Supports students in using and building on the ideas and content encountered in previous coursework. Requires students to conceptualize, design and implement an original research project that will serve as exit requirement for the degree. Reads and engages in research and theory associated with Teacher Research (i.e. research conducted by teachers for professional purposes).

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7015 (3) Teaching Internship in Teacher Education

One-semester teaching internship in an undergraduate or graduate foundations course.

Additional Information: Departmental Category: Graduate Education

EDUC 7055 (3) Philosophy of Education

Examines exemplars of educational philosophy from ancient times to the present day, emphasizing their relevance and application to current controversies in education (e.g., free speech, multiculturalism, and affirmative action). Formerly EDUC 5055.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7105 (3) Collaboration to Meet Special Needs

Covers effective collaboration practices involving the special education teacher, other educational personnel, students, and parents. Bilingual special education considerations in collaboration will be described. Issues regarding inclusion will be explored. Practical application to teaching and learning will be made. Strategies for disseminating information and collaborative activities will be discussed.

Additional Information: Departmental Category: Graduate Education

EDUC 7316 (3) Intermediate Statistical Methods

Studies sampling theory and inferential statistics; advanced applications for testing of hypotheses regarding central tendency, variability, proportion, correlation, and normality; chi-square and the analysis of frequency data; multiple regression and prediction; introduction to the analysis of variance; and related computer programs for statistical analysis.

Requisites: Requires prerequisite course of EDUC 5716 (minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7326 (3) Quasi-Experimental Design in Causal Inference in Social Sciences

Focuses on experimental and quasi-experimental designs in educational research; applications of the general linear model; power and statistical efficiency; randomization and control; multiple comparisons; factorial experiments and interaction with fixed-factor and mixed design; analysis of covariance; effects of assumption violations; and related computer programs for statistical analysis.

Additional Information: Departmental Category: Graduate Education

EDUC 7336 (3) Methods of Survey Research and Assessments

Examines theory and techniques involved in each stage of survey research, including problem formulation, questionnaire development, interview and mailed surveys, assessing reliability and validity, sampling plans, data reduction (e.g., factor analysis), and analysis of continuous and categorical data.

Requisites: Requires prerequisite courses of EDUC 5726 and EDUC 7316 (all minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7346 (3) Ethnographic Methods in Educational Research

Explores the history of ethnography and its translation into educational research. Students practice participant observation, interviewing, journal writing, artifact searches, qualitative analysis and interpretation, and styles of reporting.

Requisites: Requires a prerequisite course of EDUC 6325 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 7376 (3) Theory and Practice of Educational and Psychological Measurement

Introduces theories of measurement and applications, and presents classical test theory. Includes quantitative concepts, methods, and computational techniques for the development, application, and evaluation of measurement instruments in social/ behavioral science and education.

Requisites: Requires prerequisite course of EDUC 5716 (minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7386 (3) Educational Evaluation

Builds an understanding of the range of approaches taken by educational evaluators, focusing particularly on the evaluation of programs. Explores the nature of different evaluation perspectives and how these disparate views translate into methodological and conceptual models. Students develop a familiarity with the most common and influential approaches to evaluation.

Additional Information: Departmental Category: Graduate Education

EDUC 7396 (3) Categorical Data Analysis

Introduces contemporary advanced multivariate techniques and their application in social science research. Methods include multivariate regression and analysis of variance, structural equation models, and factor analysis. Prior experience with Anova and multiple regression is assumed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7416 (3) Seminar: Research Methodology

Presents selected topics for advanced study in educational research, statistics, measurement, and evaluation.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 7436 (3) Item Response Theory

Includes one-, two-, and three-parameter logistic models for dichotomously-scored items and partial credit models for polychotomously-scored items; applications of the models to problems such as equating of test forms, test design, computerized adaptive testing, and the detection of item bias.

Requisites: Requires prerequisite courses of EDUC 7316 and EDUC 7376 (all minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7446 (3) Seminar: Policy Issues in Education

Explores major policy issues confronting U.S. education and examines the nature and undertaking of educational policy studies. Learn to approach policy issues from a contextual perspective that highlights systemic forces and analyzes and applies differing policy instruments. While a wide variety of policies are covered in the course, it particularly emphasizes issues of educational equity.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7456 (3) Multilevel Modeling

Covers in depth two advanced multivariate models common to social science research: latent variable (structural equation) models and multi-level (hierarchical) models. Topics may be taught with a particular analytic context, such as measurement of change (longitudinal analysis) or experimental design.

Additional Information: Departmental Category: Graduate Education

EDUC 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8014 (3) Advanced Seminar in Democracy, Diversity and Social Justice

Addresses the sociopolitical context of multiculturalism and education, and the sociocultural context of learning. Examines critical issues involved in making schooling responsive to an increasingly multicultural and multilingual society.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of EDUC 8210 (minimum grade B-). Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8025 (3) Seminar: Curriculum Theories

Examines in depth recent developments in curriculum theory highlighting conceptual, contextual, and normative issues. Substantially explores distinct curricular traditions, corresponding conceptions of the good life along with related approaches to reason and emotion. Focuses on the works of prominent curriculum theorists.

Additional Information: Departmental Category: Graduate Education

EDUC 8045 (3) Philosophical Issues in Educational Research

Familiarizes students with important concepts and issues from the philosophy of science and, to a lesser extent, political theory and ethics; grounds such concepts and issues in the literature (often in terms of primary philosophical sources); and stimulates students to apply this material to the field of educational research in an informed way.

Requisites: Restricted to PhD students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8055 (3) Theoretical Issues in Education Policy

Provides students with an examination of the theories behind education policy analysis. Takes a thematic approach to the study of policy in order to understand how policy agendas are set; how democratic deliberation should be linked with research and policy; and the relationship between politics, media, social structures, research and policies.

Requisites: Restricted to PhD students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8125 (3) Seminar: Radical Education Theories

Examines radical analyses of schooling, based on class, gender, sexual identity and race, through which U.S. public schooling is said to maintain dynamics of oppression and domination that undermines the schools' democratic premise. Scrutinizes the conceptual framework, interpretive and explanatory adequacy, and ethical justification of radical claims.

Additional Information: Departmental Category: Graduate Education

EDUC 8135 (3) Seminar: Research on Teaching

Provides an historical perspective of research on teaching, focusing on the evolution of conceptual frameworks, research methods, and research findings. Examines substantive and methodological issues that underlie contemporary research on teaching. Explores areas of research including teacher knowledge and beliefs, teaching for understanding, understanding student thinking, motivation and volition, and classroom assessment.

Additional Information: Departmental Category: Graduate Education

EDUC 8145 (3) Seminar: Research on Teacher Education and Learning to Teach

Explores substantive and methodological issues that underlie current research on learning to teach, teacher education, and teacher professional development. Considers the learning and development of experienced and novice teachers, with an emphasis on learning to teach in ways that conform to reform-based educational ideas.

Additional Information: Departmental Category: Graduate Education

EDUC 8155 (3) Advanced Topics in Literacy Education

Examines special topics in theory and research related to literacy and literacy education. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 8165 (3) Advanced Topics in Mathematics Education

Examines special topics in theory and research related to mathematics education. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8175 (3) Advanced Topics in Science Education

Engages participants in the process of curriculum development. Principles that guide the development of curricula and learning environments are discussed as they integrate with learning theory. Participants develop and/or test specific activities in the classroom and modify them as a result. There is a particular focus on incorporating the practices of the discipline into each content-based activity.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 8210 (3) Perspectives on Classroom Teaching and Learning

Introduces students to various theoretical perspectives informing educational research and how they are employed to study teaching, learning, and policy in K-12 classrooms. Includes reading and discussion related to the assumptions, questions, methods, and findings associated with theoretical traditions within and across disciplines.

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8220 (3) Introduction to Educational Research and Policy

Introduces conceptual and empirical issues and controversies in educational research and policy. Complements other EDUC doctoral courses in quantitative and qualitative methodology.

Requisites: Restricted to PhD students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8230 (3) Quantitative Methods I

Explores the use of statistics to formalize research design in educational research. Introduces descriptive statistics, linear regression, probability, and the basics of statistical inference. Includes instruction in the use of statistical software, (e.g., SPSS.).

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8240 (3) Quantitative Methods II

Continues the exploration of research design in the social sciences, especially the evaluation of the quantitative research reported in professional journals. Introduces instances of the general linear model (both multiple regression and ANOVA) and its application to educational research.

Requisites: Requires prerequisite course of EDUC 8230 (minimum grade D-). Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8250 (3) Qualitative Methods I

Introduces students to the theory and practice of qualitative research in education. First of a two-course sequence covering research design, theoretical perspectives, and methods. Preference given to first-year doctoral students in education.

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8260 (3) Qualitative Methods II

Builds on EDUC 8250 to develop knowledge and skills in ethnographic and case study research. Second of a two-course sequence covering qualitative research design, theoretical perspectives, and methods.

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8348 (3) Seminar: Human Development

Intensive study of selected topics in human development. The focus of the seminar will vary depending on the instructor's expertise and students' interests. Recent topics include adolescent development in social context, Vygotsky and Cultural-Historical Activity Theory, and design-based research methods. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

Additional Information: Departmental Category: Graduate Education

EDUC 8358 (3) Seminar: Human Learning

Intensive study of selected topics in human learning. The focus of the seminar will vary depending on the instructor's expertise and students' interest. Recent topics include sociocultural and social practice theories, STEM learning in and out of school. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

Additional Information: Departmental Category: Graduate Education

EDUC 8605 (3) Research and Professional Ethics for Educational Researchers

Examines the central issues and venerable theories of philosophical ethics that have historically framed research ethics. Also examines contemporary ethical theory that emphasizes a greater attention to the social sciences. Focuses on research ethics (both research of human subjects and research misconduct), various issues of professional academic ethics, and the AERA ethical code.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8610 (3) Advanced Topics in Educational Equity and Cultural Diversity

Examines special topics in theory and research related to educational equity and cultural diversity in education. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8615 (3) Language Issues in Education Research

Examines ways in which issues of language can affect the validity of educational research. Discusses how language can be properly addressed with a multidisciplinary perspective through different stages in the process of an investigation, including design, sampling, data collection, and data analysis. Provides the conceptual basis for addressing linguistic diversity from a multidisciplinary perspective.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8710 (3) Measurement in Survey Research

Introduces students to classical test theory and item response theory. Emphasizes the process of developing, analyzing and validating a survey instrument. Focuses on developing a survey instrument with items that derive from a clearly delineated theory for the construct to be measured. Analyzes item responses and put together a validity argument to support the proposed uses of the survey.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8720 (3) Advanced Topics in Measurement

Focuses on psychometric models for measurement and their applications in educational and psychological research. Emphasizes understanding and evaluating the utility of models from item response theory (IRT). Applies and compares measurement models in the context of simulated or empirical data sets.

Recommended: Prerequisite EDUC 8710.

Additional Information: Departmental Category: Graduate Education

EDUC 8730 (3) Advanced Qualitative Data Analysis

Requires students begin semester with qualitative data already collected (from class project, pilot study, dissertation). Instructors present diverse methods of analyzing data and writing about interpretations. Instructors customize part of course to address specific topic of expertise, e.g., discourse analysis, video analysis, textual analysis, ethnographic analysis.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 8740 (3) Advances in the Assessment of Student Learning

Focuses on theories underlying traditional and contemporary proposals for assessment of student learning, and design and research of large-scale and classroom-based methods to assess student learning. Explores intersections between large-scale and classroom assessment, although greater attention is given to issues related to classroom assessment.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8804 (3) Special Topics

Designed to meet needs of graduate students with topics of pertinent interest.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8844 (1-4) Doctoral Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8855 (1-4) Independent Study in Curriculum and Instruction: Doctoral Level

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8866 (1-4) Independent Study in Research and Evaluation Methodology: Doctoral Level

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8877 (1-4) Independent Study in Educational Equity and Cultural Diversity: Doctoral Level

An independent study may be established between a doctoral student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8888 (1-4) Independent Study in Learning and Human Development: Doctoral Level

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8899 (1-4) Independent Study in Educational Foundations Policy and Practice: Doctoral Level

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8935 (1-6) Internship in Curriculum and Instruction

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8936 (1-6) Internship in Research and Evaluation Methodology

Repeatable: Repeatable for up to 36.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8937 (1-6) Internship in Educational Equity and Cultural Diversity

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8938 (1-6) Internship in Learning Sciences and Human Development

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8939 (1-6) Internship in Educational Foundations Policy and Practice

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8950 (3) Prospectus and Dissertation Writing

Provides students with ongoing opportunities to write social science research in the context of the design, analysis and data representation, development, and write-up of students' dissertation proposals and dissertations. Students will learn to expand how they think about and use evidence, clarify their ideas and arguments, and improve their writing. Students working on proposals and dissertations should enroll.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8994 (1-10) PhD Doctoral Dissertation

Repeatable: Repeatable for up to 60.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

Curriculum and Instruction

Curriculum and Instruction (C&I) graduate programs focus on teaching and learning in the following curricular areas: Literacy Studies (master's and PhD), Math & Science (master's and PhD), Humanities (master's only) and Research on Teaching and Teacher Education (PhD only). Course work focuses on foundations of learning, foundations of education, and subject matter knowledge and pedagogy. The programs prepare students to understand the complexities of classroom contexts and teaching practice.

The C&I master's programs are closely associated with a special program in the School of Education – Partners in Education (PIE) (<http://www.colorado.edu/education/node/573>). The program allows beginning teachers to teach in K–12 schools, receive professional support in their classrooms, and concurrently earn a master's degree.

The C&I PhD program is a research-oriented degree program that combines rigorous preparation for teaching and research in specific content areas with particular attention devoted to curriculum and instruction, cognitive and social processes, and research methodology. Specialty areas include Literacy Studies (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci-literacy-studies>), Mathematics Education (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci-math-science-education>), Science Education (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci-math-science-education>), and Research on Teaching and Teacher Education (ROTATE) (<http://www.colorado.edu/education/graduate-programs/research-teaching-teacher-education-rotate>). It is an ideal degree for those interested in the processes of instruction and learning within one of the previously mentioned content areas, and/or in the education and professional development of teachers. This degree is intended for those interested in preparing for careers in research and teaching in university settings, educational leadership and services to schools, or research and development in the private or non-profit sector.

Concurrent Degree Program: BA in Ethnic Studies + MA in Curriculum & Instruction + Teaching Licensure

The new 4+1 Ethnic Studies and Education Concurrent Degree Program offers you an efficient and rigorous path toward earning a Bachelor's Degree in Ethnic Studies and a Master's Degree in Education in five years. The program invites highly focused ethnic studies students who are interested in applying their critical thinking skills and dedication to social justice to transformative careers in education.

The program consists of: MA in Curriculum & Instruction and teacher licensure for those students in Ethnic Studies who are interested in becoming licensed teachers in either Secondary English Language Arts, Secondary Social Studies, or Elementary Education.

Admissions

You may apply at the beginning of your junior year or at anytime thereafter prior to completion of your undergraduate studies. Applications are submitted to and reviewed by the School of Education.

Applicants must:

- Have declared Ethnic Studies as a major
- Have completed all MAPS requirements
- Have a minimum GPA of 3.0.

Applications

- Three letters of reference. Two letters must come from professors with whom you have taken Ethnic Studies or Education courses. The third letter may be from a professor, instructor, or supervisor in a community or educational setting
- Personal Statement
- 25 Hours of Youth Experience (for the MA in Curriculum & Instruction + teacher licensure only)

Continuation in the Program

Once admitted, students must:

- Maintain a cumulative GPA of 3.0.
- Complete 6 credits of graduate-level coursework by the second semester of senior year.

The BA/MA has a required 5-year time limit. You must complete all requirements for the BA by the end of your 8th semester and complete all requirements for the MA by the end of your final 5th year.

Contact Us

Completing the 4+1 program requires careful planning. Consult your advisor early to help chart your degree plan. Contact Education advisors at via email (edadvise@colorado.edu) or 303-492-6555. Contact Ethnic Studies advisors via email (ethnicst@colorado.edu) or at 303-492-8852

The School of Education and Department of Ethnic Studies have partnered to support the 4+1 degree program that reflects each unit's commitment to educational opportunity, diversity, and engaged scholarship examining how race and the interrelated categories of ethnicity, disabilities, language, gender, class, and sexuality impact the lives of people locally and globally.

Master's Degree

- Curriculum and Instruction - Master of Arts (MA) (p. 1157)

Doctoral Degree

- Curriculum and Instruction - Doctor of Philosophy (PhD) (p. 1161)

Education - Curriculum and Instruction - Master of Arts (MA)

The Master of Arts degree requires one academic year or more of graduate work beyond the bachelor's degree.

Program Tracks

Humanities Education Track

This track is designed to support teachers who are interested in developing greater understanding and expertise in the teaching and learning of the humanities. Courses within this concentration provide opportunities for teachers to strengthen discipline-specific content knowledge, knowledge for teaching humanities, and a greater understanding of how curriculum and instructional approaches can be tailored to foster students' understanding of concepts and questions about human experience and culture that invite a multidisciplinary response.

This track is only offered as a master's degree. Prospective doctoral students interested in the humanities are encouraged to consider the Educational Foundations, Policy and Practice (p. 1170) program.

Literacy Education Track

This track is designed to support teachers who are interested in developing greater understanding and expertise in the teaching and learning of literacy. Students completing this 30-credit-hour program are eligible for a Reading Teacher K–12 endorsement from the state of Colorado. Because the endorsement is an advanced and specialty certification, all candidates for the degree must have a minimum of two

years' teaching experience and have passed the Reading Teacher PLACE Exam before they can receive the endorsement.

Typical students in the program are practicing teachers who want to strengthen their literacy instruction and earn a Reading Teacher K–12 endorsement from the state of Colorado. Some enroll in the program in conjunction with their participation in the Partners in Education (PIE) program, a CU-sponsored professional development opportunity for teachers in the early stages of their career that's offered in collaboration with local school districts. For more information on this program, visit the School of Education's Partners in Education (PIE) Master's Program (<http://www.colorado.edu/education/graduate-programs/partners-education-pie-masters-program-original>) webpage or contact Penny Scott-Oliver (303-492-8499, penny.oliver@colorado.edu (Penny.Oliver@Colorado.edu)).

Math & Science Education Track

This track is designed to support teachers who are interested in developing greater understanding and expertise in the teaching and learning of mathematics and science. The program helps teachers develop their own content knowledge in mathematics and science, as well as greater understanding of how curriculum and instructional strategies can be tailored to foster K–12 students' understandings of mathematics and science.

Typical candidates in the program are practicing teachers. Some enroll in the program in conjunction with their participation in the Partners in Education (PIE) program, a CU-sponsored professional development opportunity for teachers in the early stages of their career that's offered in collaboration with local school districts. For more information on this program, visit the School of Education's Partners in Education (PIE) Master's Program (<http://www.colorado.edu/education/graduate-programs/partners-education-pie-masters-program-original>) webpage or contact Penny Scott-Oliver (303-492-8499, penny.oliver@colorado.edu (Penny.Oliver@Colorado.edu)).

Requirements

General Requirements

Program Requirements

Students must successfully complete 30 credit hours of approved course work while maintaining at least a B (3.0) average in all work attempted while enrolled.

Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year time limit.

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours, and is accepted only after approval of the department chair/program director and under the special conditions outlined in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Master's degree students who began CU's Teacher Education Program as undergraduates or as post-baccalaureate students have the following transfer credit options:

- If the student took the courses as an undergraduate, they may be eligible to transfer two of their track's eligible transfer courses, depending on when those courses were taken. Contact the teacher education student advisor or the graduate studies coordinator for more information.
- If the student took the courses as a post-baccalaureate student, they may transfer two of their track's eligible transfer courses as electives, as long as the courses were taken within the past five years. Note: Students transferring from secondary programs will transfer 7 credits; therefore, they will complete a 31-credit master's degree.

Time Limit

The master's degree must be completed within four years.

Program Tracks

Humanities Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Learning and Development

Choose at least 3 credit hours of learning and development courses. 3
Eligible courses include:

EDUC 6318	Psychological Foundations of Education
EDUC 6328	Advanced Child Growth and Educational Development
EDUC 5105	Teaching for Understanding and Equity

Foundations of Education Curriculum

Choose at least 3 credit hours of foundations of education curriculum courses. Eligible courses include: 3

EDUC 5065	Curriculum Theories
EDUC 5075	Sociology in Education
EDUC 5085	History of American Education
EDUC 5115	Issues in School Change and Reform
EDUC 5726	Introduction to Disciplined Inquiry
EDUC 6210	Education Policy and the Law
EDUC 6220	Gender Issues in Education
EDUC 6230	Ethics in Education
EDUC 6325	Culture and Ethnography in Education
EDUC 7055	Philosophy of Education
EDUC 7446	Seminar: Policy Issues in Education

Curriculum and Instruction in Humanities

Choose at least 12 credit hours of curriculum and instruction in the humanities courses. Eligible courses include: ¹ 12

EDUC 5070	Spirituality and Religion in Education (3 credit hours)
EDUC 5145	Gender, Literacy, and the K-12 Classroom (3 credit hours)
EDUC 5165	Children's Literature (3 credit hours)

EDUC 5222	Language Study for Educators (3 credit hours)	
EDUC 5235	Language and Literacy Across the Curriculum (3 credit hours)	
EDUC 5265	Processes in Writing (3 credit hours)	
EDUC 5316	Nature of Social Studies and Social Studies Education (3 credit hours)	
EDUC 5325	Teaching Literature in Middle and Secondary Schools (4 credit hours)	
EDUC 5345	Writing in Humanities Classrooms (4 credit hours)	
EDUC 5445	Curriculum for Multicultural Education (4 credit hours)	
EDUC 6804	Special Topics (3 credit hours)	

Electives

Choose at least 9 additional credit hours of courses at the 5000 level or above from within the School of Education, to be chosen in consultation with our advisor.^{1,2,3,4}

Total Credit Hours 27

¹ See also "Eligible Transfer Courses" below.

² GRTE courses may not count toward a master's degree.

³ Students may deepen their content knowledge in the humanities disciplines by taking a maximum of 6 credit hours of courses in the College of Arts & Sciences at the 3000 level or above that are taught by graduate faculty.

⁴ PIE candidates may use the 3-credit-hour Practicum in Curriculum and Instruction (EDUC 6915) and the 3-credit-hour Internship in Curriculum and Instruction (EDUC 8935) as two electives.

PIE Program Requirements

- 3 credit hours in EDUC 6915 Practicum in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in EDUC 8935 Internship in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in Learning and Development courses
- 3 credit hours in Foundations in Education and Curriculum courses
- 12 credit hours in Curriculum and Instruction courses in mathematics and science
- 3 credit hours in EDUC 6964 Capstone: Inquiry in the Content Areas
- 3 credit hours of electives

For more information on this program, visit the School of Education's Partners in Education (PIE) Master's Program webpage.

Eligible Transfer Courses

See the Transfer Credit (p. 1158) section for details.

EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 5215	Elementary Science Theory and Methods	3
EDUC 5316	Nature of Social Studies and Social Studies Education	3
EDUC 5355	Methods and Materials in Secondary Social Studies	4
EDUC 5325	Teaching Literature in Middle and Secondary Schools	3
EDUC 5365	Methods and Materials in Secondary English	4

Comprehensive Exam/Capstone

During the final spring semester prior to graduation, students must enroll in the capstone course, EDUC 6964 Capstone: Inquiry in the Content

Areas, and successfully complete a teacher research project/major paper. The capstone course is only offered in spring semesters.

The master's comprehensive examination requirement is satisfied by the successful completion of the project/paper, which is evaluated by both the course instructor and at least one outside reader who holds a graduate appointment. Students must be registered for the comprehensive examination during the semester they complete the teacher researcher project/major paper.

Literacy Education Track with CO Reading Teacher Endorsement Track-Specific Courses

In addition to the required core courses, students must complete the following track-specific course requirements.

EDUC 5245	Foundations of Reading Instruction K-12	3
EDUC 5255	Digital Literacies and New Media (prerequisite EDUC 5245)	3
EDUC 5265	Processes in Writing	3
EDUC 5275	Assessment in Literacy (prerequisite EDUC 5255)	3
EDUC 5285	Reading Clinic Procedures K-12 (prerequisite EDUC 5275; capstone course)	3

Total Credit Hours 15

Electives

An additional 15 credit hours of electives are required. Electives may be selected from any School of Education program area with the agreement of the advisor. Education courses must be at the 5000 level or above.

Suggested electives include the following:

Learning Development

EDUC 6318	Psychological Foundations of Education
EDUC 6328	Advanced Child Growth and Educational Development
EDUC 5105	Teaching for Understanding and Equity
Foundations in Education, Curriculum or Educational Research	
EDUC 5065	Curriculum Theories
EDUC 5075	Sociology in Education
EDUC 5085	History of American Education
EDUC 5115	Issues in School Change and Reform
EDUC 5726	Introduction to Disciplined Inquiry
EDUC 6220	Gender Issues in Education
EDUC 6230	Ethics in Education
EDUC 6325	Culture and Ethnography in Education
EDUC 7055	Philosophy of Education
EDUC 7446	Seminar: Policy Issues in Education

Curriculum and Instruction

EDUC 5070	Spirituality and Religion in Education
EDUC 5222	Language Study for Educators
EDUC 5235	Language and Literacy Across the Curriculum
EDUC 5315	Perspectives on Science
EDUC 5165	Children's Literature
EDUC 5316	Nature of Social Studies and Social Studies Education
EDUC 5317	Perspectives on Mathematics
EDUC 5445	Curriculum for Multicultural Education

EDUC 5325	Teaching Literature in Middle and Secondary Schools	
EDUC 5345	Writing in Humanities Classrooms	
EDUC 5706	Assessment in Mathematics and Science Education	
EDUC 5810	Teaching K-12 Mathematics: Number Sense	
EDUC 5820	Teaching K-12 Mathematics: Algebraic Thinking	
EDUC 5830	Teaching K-12 Mathematics: Geometry & Measurement	
EDUC 5840	Teaching K-12 Mathematics: Probability & Statistics	

Culturally and Linguistically Diverse Learners

EDUC 5035	Proseminar: Parent and Community Involvement	
EDUC 5445	Curriculum for Multicultural Education	
EDUC 5455	Literacy for Linguistically Different Learners	
EDUC 5525	Research Issues in Special Education	
EDUC 5615	Second Language Acquisition	
EDUC 5625	Methods of Teaching English as a Second Language	

¹ See also "Eligible Transfer Courses" below.

² GRTE courses may not count toward a master's degree.

³ Students may deepen their content knowledge in the mathematics or science disciplines by taking a maximum of 6 credit hours of courses in the College of Arts & Sciences at the 3000 level or above that are taught by graduate faculty.

⁴ PIE candidates may use the 3-credit-hour Practicum in Curriculum and Instruction (EDUC 6915) and the 3-credit-hour Internship in Curriculum and Instruction (EDUC 8935) as two electives.

PIE Program Requirements

- 3 credit hours of EDUC 6915 Practicum in Curriculum and Instruction (meets elective requirement)
- 3 credit hours of EDUC 8935 Internship in Curriculum and Instruction (meets elective requirement)
- 15 credit hours of courses in Literacy Education
- 9 credit hours of electives

For more information on this program, visit the School of Education's Partners in Education (PIE) Master's Program webpage.

Eligible Transfer Courses

See the Transfer Credit (p. 1158) section for full details.

EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 5215	Elementary Science Theory and Methods	3
EDUC 5316	Nature of Social Studies and Social Studies Education	3
EDUC 5355	Methods and Materials in Secondary Social Studies	4
EDUC 5325	Teaching Literature in Middle and Secondary Schools	3
EDUC 5365	Methods and Materials in Secondary English	4
EDUC 5317	Perspectives on Mathematics	3
EDUC 5375	Problem-Based Math Instruction	4
EDUC 5385	Problem-Based Science Instruction	4

Comprehensive Exam

The master's comprehensive examination requirement is satisfied by the successful completion of the teacher research project/major paper in Reading Clinic Procedures K-12 (EDUC 5285). This major paper is evaluated by both the course instructor and at least one outside reader who holds a graduate appointment. Students must be registered for the comprehensive examination during the semester they complete the teacher researcher project/major paper.

Math & Science Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Learning and Development

Choose at least 3 credit hours of learning and development courses. 3
Eligible courses include:

EDUC 6318	Psychological Foundations of Education
EDUC 6328	Advanced Child Growth and Educational Development
EDUC 5105	Teaching for Understanding and Equity

Foundations of Education Curriculum

Choose at least 3 credit hours of foundations of education curriculum courses. Eligible courses include: 3

EDUC 5065	Curriculum Theories
EDUC 5075	Sociology in Education
EDUC 5085	History of American Education
EDUC 5115	Issues in School Change and Reform
EDUC 5726	Introduction to Disciplined Inquiry
EDUC 6210	Education Policy and the Law
EDUC 6220	Gender Issues in Education
EDUC 6230	Ethics in Education
EDUC 6325	Culture and Ethnography in Education
EDUC 7055	Philosophy of Education
EDUC 7446	Seminar: Policy Issues in Education

Curriculum and Instruction in Mathematics and Science

Choose at least 12 credit hours of curriculum and instruction in mathematics and science courses. Eligible courses include: ¹ 12

EDUC 5070	Spirituality and Religion in Education (3 credit hours)
EDUC 5317	Perspectives on Mathematics
EDUC 5460	Teaching and Learning Physics
EDUC 5580	Physics and Everyday Thinking
EDUC 5706	Assessment in Mathematics and Science Education
EDUC 5810	Teaching K-12 Mathematics: Number Sense
EDUC 5820	Teaching K-12 Mathematics: Algebraic Thinking
EDUC 5822	Teaching and Learning Chemistry
EDUC 5830	Teaching K-12 Mathematics: Geometry & Measurement
EDUC 5840	Teaching K-12 Mathematics: Probability & Statistics
EDUC 6804	Special Topics (3 credit hours)
EDUC 6811	Teaching and Learning Biology

Electives

Choose at least 9 additional credit hours of courses at the 5000 level or above from within the School of Education, to be chosen in consultation with your advisor. ^{1,2,3,4} 9

Total Credit Hours 27

¹ See also "Eligible Transfer Courses" below.

² GRTE courses may not count toward a master's degree.

³ Students may deepen their content knowledge in the mathematics or science disciplines by taking a maximum of 6 credit hours of courses in the College of Arts & Sciences at the 3000 level or above that are taught by graduate faculty.

⁴ PIE candidates may use the 3-credit-hour Practicum in Curriculum and Instruction (EDUC 6915) and the 3-credit-hour Internship in Curriculum and Instruction (EDUC 8935) as two electives.

PIE Program Requirements

- 3 credit hours in EDUC 6915 Practicum in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in EDUC 8935 Internship in Curriculum and Instruction (meets elective requirement)
- 3 credit hours in Learning and Development courses
- 3 credit hours in Foundations in Education and Curriculum courses
- 12 credit hours in Curriculum and Instruction courses in mathematics and science
- 3 credit hours in EDUC 6964 Capstone: Inquiry in the Content Areas
- 3 credit hours of electives

For more information on this program, visit the School of Education's Partners in Education (PIE) Master's Program webpage.

Eligible Transfer Courses

See the Transfer Credit (p. 1158) section for full details.

EDUC 5205	Elementary Mathematics Theory and Methods	3
EDUC 5215	Elementary Science Theory and Methods	3
EDUC 5317	Perspectives on Mathematics	3
EDUC 5375	Problem-Based Math Instruction	4
EDUC 5385	Problem-Based Science Instruction	4

Comprehensive Exam

During the final semester (or after completing at least 21 credits in the degree program), students enroll in the capstone course, Capstone: Inquiry in the Content Areas (EDUC 6964). The master's comprehensive examination requirement is satisfied by the successful completion of the teacher research project/major paper in the capstone course. This major paper is evaluated by both the course instructor and at least one outside reader who holds a graduate appointment. Students must be registered for the comprehensive examination during the semester they complete the teacher researcher project/major paper.

Students must have 21 credit hours completed prior to enrollment in the capstone course, or permission of their advisor. The capstone course is only offered in spring semester.

Education - Curriculum and Instruction - Doctor of Philosophy (PhD)

The curriculum and instruction (C&I) PhD program is a research-oriented degree program that combines rigorous preparation for teaching and research in specific content areas, with particular attention devoted to curriculum and instruction, cognitive and social processes and research methodology.

It is an ideal degree for those interested in the processes of instruction and learning within one of the previously mentioned content areas, and/or in the education and professional development of teachers.

Specialty areas include:

- literacy studies
- mathematics education
- science education
- research on teaching and teacher education (ROTATE)

For more information on C&I specialty areas, visit the School of Education's Graduate Programs (<http://www.colorado.edu/education/graduate-programs>) webpage.

This degree is intended for those interested in preparing for careers in research and teaching in university settings, educational leadership and services to schools, or research and development in the private or nonprofit sector.

Requirements

General Requirements

Student must successfully complete 56 credit hours of approved course work, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Required Core Courses

EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6925	Readings in Curriculum and Instruction (First Year: Fall semester)	1
EDUC 6925	Readings in Curriculum and Instruction (First Year: Spring semester)	1
	Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses)	3

Total Credit Hours 23

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and associate dean for graduate studies. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Program Tracks

For more information about each track, see the program's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/curriculum-instruction-ci/phd-research-teaching-teacher-education/degree>) webpage.

Research on Teaching & Teacher Education (ROTATE) Track

In addition to the required core courses, students must complete the following track-specific course requirements.

ROTATE Doctoral Seminar

EDUC 8145	Seminar: Research on Teacher Education and Learning to Teach	3
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ROTATE Courses

EDUC 8025	Seminar: Curriculum Theories	3
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Advanced Methods

Choose at least 6 credit hours of advanced methods courses (qualitative or quantitative) from within or outside the School of Education in consultation with your advisor. Eligible courses include:

COMM 6410	Discourse Analysis	6
EDUC 8730	Advanced Qualitative Data Analysis	
EDUC 8710	Measurement in Survey Research	
LING 7800	Open Topics in Linguistics	
LING 6310	Sociolinguistic Analysis	
SOCY 6121	Qualitative Methods	
SOCY 7171	Special Topics (Writing Qualitative Research)	
SOCY 7026	Feminist Research Methods	

Electives

Choose at least 12 additional credit hours of courses from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise.

Total Credit Hours 24

Literacy Studies Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Literacy Doctoral Seminar

Students must complete a literacy doctoral seminar every spring semester in the first four years of study. 12

Advanced Methods

Choose at least 6 credit hours of advanced methods courses (qualitative or quantitative) from within or outside the School of Education in consultation with your advisor. Eligible courses include:

COMM 6410	Discourse Analysis	
EDUC 8730	Advanced Qualitative Data Analysis	

EDUC 8710	Measurement in Survey Research	
LING 7800	Open Topics in Linguistics	
LING 6310	Sociolinguistic Analysis	
SOCY 6121	Qualitative Methods	
SOCY 7171	Special Topics (Writing Qualitative Research)	
SOCY 7026	Feminist Research Methods	

Writing Course

EDUC 8950	Prospectus and Dissertation Writing	3
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Cognate Requirement

Choose a minimum of two courses (6 credits) in an area of specialization to be taken outside of the School of Education. The courses related to a student's specialty area may be defined by discipline (e.g., linguistics, anthropology, English literature) or by focus (e.g., critical approaches to race, class and gender; urban studies). These credits may potentially overlap with Advanced Methods. 6

ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	
ANTH 5785	Advanced Seminar in Cultural Anthropology	
COMM 6360	Social and Cultural Theory	
COMM 6420	Interaction Analysis	
COMM 6780	Roles, Relationships, and Identities in Interaction	
ENGL 5319	Studies in Literary Movements	
ENGL 7489	Advanced Special Topics	
ENGL 7179	Advanced Multicultural/Postcolonial Studies	
ENGL 5019	Survey of Contemporary Literary and Cultural Theory	
ETHN 6011	Race and Sexuality Studies	
ETHN 5306	The Chicana and Chicano and U.S. Social Systems	
ETHN 6001	Research Methods in Comparative Ethnic Studies	
LING 7800	Open Topics in Linguistics	
LING 6560	Language Acquisition	
LING 6450	Syntactic Analysis	
PHIL 5200	Contemporary Political Philosophy	
PHIL 5300	Philosophy of Mind	
PHIL 5290	Topics in Values and Social Policy	
PHIL 5490	Philosophy of Language	
PHIL 5210	Philosophy and Social Policy	
SOCY 7036	Feminist Theory	
SOCY 6041	Cultural Sociology	
SOCY 5201	Graduate Seminar in Sociological Theory	
SOCY 7131	Seminar in Social Psychology	

Electives

Choose a minimum of 9 additional credit hours of courses from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. 9

EDUC 8358	Seminar: Human Learning	
EDUC 8145	Seminar: Research on Teacher Education and Learning to Teach	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8804	Special Topics	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 7386	Educational Evaluation	

EDUC 8045	Philosophical Issues in Educational Research	
EDUC 6220	Gender Issues in Education	
EDUC 6210	Education Policy and the Law	
EDUC 7055	Philosophy of Education	
EDUC 8055	Theoretical Issues in Education Policy	
Total Credit Hours		30

Math Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Mathematics Doctoral Seminar

EDUC 8165	Advanced Topics in Mathematics Education (three semesters, beginning in spring semester of the first year of study)	9
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Advanced Methods

Two courses in either qualitative or quantitative methods. Options within and outside of the School of Education may be chosen in consultation with your advisor. 6

EDUC 8710	Measurement in Survey Research	
EDUC 8720	Advanced Topics in Measurement	
EDUC 8730	Advanced Qualitative Data Analysis	
COMM 6410	Discourse Analysis	

Electives

Choose a minimum of 18 additional credit hours of courses, at least 6 of which must be from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. Eligible courses include: 18

EDUC 7386	Educational Evaluation	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8740	Advances in the Assessment of Student Learning	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8804	Special Topics (Advanced Topics in Educational Psychology/Learning Sciences)	
EDUC 8XXX	Advanced Topics and Research on Teaching and Teacher Education	

Total Credit Hours 33

Science Education Track

In addition to the required core courses, students must complete the following track-specific course requirements.

Science Doctoral Seminar (9 credits) and Advanced Methods (6 credits in either qualitative or quantitative)

Science Doctoral Seminar 9

EDUC 8175	Advanced Topics in Science Education (three semesters, beginning in spring semester of the first year of study)	9
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Advanced Methods 6

Two courses in either qualitative or quantitative methods. Options within and outside of the School of Education may be chosen in consultation with your advisor. Eligible courses include:

COMM 6410	Discourse Analysis	
EDUC 7456	Multilevel Modeling	
EDUC 8730	Advanced Qualitative Data Analysis	

EDUC 8710	Measurement in Survey Research	
LING 7800	Open Topics in Linguistics	
LING 6310	Sociolinguistic Analysis	
SOCY 6121	Qualitative Methods	
SOCY 7171	Special Topics (Writing Qualitative Research)	
SOCY 7026	Feminist Research Methods	

Electives

Choose a minimum of 18 additional credit hours of courses, at least 6 of which must be from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. Eligible courses include: 18

EDUC 7386	Educational Evaluation	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8740	Advances in the Assessment of Student Learning	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8804	Special Topics (Advanced Topics in Educational Psychology/Learning Sciences)	
EDUC 8XXX	Advanced Topics and Research on Teaching and Teacher Education	

Total Credit Hours 33

Language Requirement

Please see the *Graduate Student Handbook* (<http://www.colorado.edu/education/node/522/attachment/newest>) for information on this requirement.

Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any course work hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews etc., are typical ways to satisfy the requirement.

Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their course work (the third year of the program for students in the literacy studies track). The committee, comprised of three graduate faculty members, must be approved by the associate dean and graduate coordinator prior to the exam. The candidacy application should also be submitted at this time.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Prospectus

The dissertation prospectus committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder (students in the literacy studies track may receive an exception with approval from the School of Education faculty committee members). These members must also be approved prior to the prospectus. A signature page should be turned in to the graduate studies coordinator upon completion.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Final Defense

The dissertation committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder (students in the literacy studies track may receive an exception with approval from the School of Education faculty committee members). These members must also be approved prior to the defense. A signature page and final exam form should be turned in to the graduate studies coordinator upon completion. The complete and revised dissertation should be submitted to the Graduate School via the Proquest website according to Graduate School semester deadlines.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Time Limit

The doctoral degree must be completed within six years.

Educational Equity and Cultural Diversity

Educational Equity and Cultural Diversity (EECD) offers a course of study devoted to the critical examination of theory, practice and policy in two major areas of emphasis:

- The education of culturally and linguistically diverse students, and
- The education of exceptional children.

The program stresses analysis, evaluation and implementation of educational programs for students who represent diverse learning needs within the public school system. School culture, language policies and the social and political context of schooling are examined across emphases. Policies that affect the assessment, placement and services provided for exceptional children also are examined.

Program faculty offer courses in first and second language acquisition theory, program development for bilingual education and English as a second language, and methodologies appropriate for such programs. Faculty also offer courses in special education methodologies, assessment, and program implementation. Additional related courses are available in other programs of the School of Education and in other departments of the university.

The program is designed to train scholars, teachers, resource specialists, and administrators for careers in academic institutions, public schools and federal and state agencies. Doctoral level preparation is research-oriented and qualifies graduates to be curriculum specialists in school districts or faculty in university positions.

Master's Degree

- Educational Equity and Cultural Diversity - Master of Arts (MA) (p. 1164)

Doctoral Degree

- Educational Equity and Cultural Diversity - Doctor of Philosophy (PhD) (p. 1167)

Educational Equity and Cultural Diversity - Master of Arts (MA)

Educational Equity and Cultural Diversity (EECD) offers a course of study devoted to the critical examination of theory, practice and policy in two major areas of emphasis: the education of culturally and linguistically diverse students and the education of exceptional children. The program stresses analysis, evaluation and implementation of educational programs for students who represent diverse learning needs within the public school system. School culture, language policies and the social and political context of schooling are examined across emphases. Policies that affect the assessment, placement and services provided for exceptional children also are examined.

Culturally & Linguistically Diverse Education Emphasis

The School of Education offers the master's degree in Educational Equity & Cultural Diversity (EECD) with an emphasis in Culturally and Linguistically Diverse education. Completion of this program qualifies one for a Colorado endorsement in the area of Culturally and Linguistically Diverse education (K-12). Individuals who are fluent in Spanish and complete the endorsement in Linguistically Diverse Learners may also be eligible for the Linguistically Diverse Education Specialist: Bilingual Education endorsement.

The program provides a range of direct experiences in bilingual/multicultural/ESL education with the opportunity to develop skills and competencies essential to the work of educators of the linguistically different learner. The overall purpose of the program is to develop sound bilingual/multicultural/ESL competencies in teachers and school leaders. Program course work includes foundations of bilingual/multicultural education, assessment practices and issues, methods in bilingual and ESL, and a field-based practicum. Participation in the program may be on a part-time basis. International students seeking participation in this program should consult with a faculty advisor before applying for admission and must complete a practicum in a public school. This program is not appropriate for individuals wishing to teach English as a foreign language in other countries.

Culturally & Linguistically Diverse Ed/ Special Ed Generalist Emphasis

The School of Education offers the master's degree in Educational Equity & Cultural Diversity (EECD) with an emphasis in bilingual/ESL special education. Completion of this program qualifies one for a teacher certification double endorsement in the areas of Special Education Generalist and Linguistically Diverse education (K-12). Graduates of this program are typically employed in school special education programs. The program offers courses in foundations in special and bilingual/multicultural education; assessment issues and practices in bilingual/ESL special education; methods of bilingual, ESL and special education;

and a field-based practicum. This program is not suitable for international students seeking preparation in Teaching English as a Foreign Language (TEFL). This is a part-time program with courses offered evenings and summers. This program is designed to be completed over a three year period.

Social/Multicultural/Bilingual Education Emphasis

This program is a non-endorsement degree with an interdisciplinary focus. The program offers courses in foundations of bilingual/multicultural education, curriculum and methods in multicultural education, and curriculum theory. Participation in the program may be on a part-time or full-time basis.

Requirements

Educational Equity and Cultural Diversity (EECD): Bilingual & Multicultural Education (non-endorsement) MA Degree Plan

(EECD: Bilingual & Multicultural Education (non-endorsement) MA Degree Plan PDF version (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity/ma-multicultural-education/degree>))

A. Requirements for Master's Degree

1. Students must successfully **complete 30 credit hours** of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled.
2. Successfully pass their Comprehensive Exam.
3. The master's degree must be completed within four years.

B. Degree Requirements

Course Work Requirements: Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The program requires 15 credit hours in bilingual, ESL, and multicultural education. The remaining 15 credit hours may be taken either in the School of Education or in other CU departments, but should be discussed with and approved by an advisor. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four year limit. This program does **not** lead to an added endorsement in Linguistically Diverse Education.

Courses and Minimum Required Credit Hours

Core Requirements: 15 credit hours

15

The program requires 15 credit hours in bilingual, ESL, and multicultural education. All students must take EDUC 5525/5605 Research Issues in Bilingual/Special Education. Suggested courses include the following:

EDUC 5525/5605	Research Issues in Special Education
EDUC 5035	Proseminar: Parent and Community Involvement
EDUC 5425	Introduction to Bilingual/Multicultural Education
EDUC 5445	Curriculum for Multicultural Education

EDUC 5455	Literacy for Linguistically Different Learners
EDUC 5615	Second Language Acquisition
EDUC 5625	Methods of Teaching English as a Second Language

Total Credit Hours

15

C. Elective Courses

An additional 15 credit hours of electives are required. Electives may be selected from any School of Education program area or in other departments on campus, with the agreement of the advisor. Education courses must be at the 5000-level or above. GRTE courses may NOT count toward a master's degree. Students may also wish to deepen their content knowledge in mathematics or science by taking courses in the Arts & Sciences at the 3000-or-above level if taught by graduate faculty. A maximum of 6 credit hours may be completed in Arts & Sciences courses taken at the 3000 or 4000 level.

D. Comprehensive Exam

A written comprehensive examination must be completed during the student's last term of study for the MA degree. The examination will cover the content of all work in the program. Students transferring course work from other institutions to this program (up to nine credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at the University of Colorado, Boulder. You must be enrolled in a course in the same semester you are taking comps.

Transfer of Credit: *(If you have transfer credits you must complete the Transfer of Credit paperwork)

Students who completed appropriate coursework at another institution may transfer credit under the following guidelines. Transfer credits from accredited institutions are accepted by CU Boulder only after approval by the department chair/program director and under the special conditions outlined in the Graduate School Rules. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a non-degree student within the CU system. **The maximum amount of work that may be transferred from another accredited institution to CU Boulder is nine credit hours and is accepted only after approval of the program director. All courses accepted for transfer must be graduate level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.** Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Educational Equity and Cultural Diversity (EECD): Culturally and Linguistically Diverse Education (CO CLD Endorsement) MA Degree Plan

(EECD: Culturally and Linguistically Diverse Education (CO CLD Endorsement) MA Degree Plan PDF version (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity/ma-eeed-culturally-linguistically-diverse-00>))

A. Requirements for Master's Degree

1. Student must successfully complete 30-31 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled.
2. Successfully pass their Comprehensive Exam.
3. The master's degree must be completed within four years.

B. Degree Requirements

Course Work Requirements: Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 31 credit hours are completed within the four year limit. Approved coursework meets the following course requirements:

Courses and Minimum Required Credit Hours

<i>Course or Requirement:</i>		
EDUC 5425/5465	Introduction to Bilingual/Multicultural Education	3
EDUC 5445	Curriculum for Multicultural Education	3
EDUC 5035	Proseminar: Parent and Community Involvement	3
EDUC 5435	Materials and Methods in Bilingual/ Multicultural Education	3
EDUC 5455	Literacy for Linguistically Different Learners	3
EDUC 5535	Diagnostic Testing in ESL and Bilingual Education	3
EDUC 5605	Research Issues in Bilingual Education	3
EDUC 5615	Second Language Acquisition	3
EDUC 5625	Methods of Teaching English as a Second Language	3
Total Credit Hours		27

C. Comprehensive Exam

A written comprehensive examination must be completed during the student's last term of study for the MA degree. The examination will cover the content of all work in the program. Students transferring course work from other institutions to this program (up to nine credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at the University of Colorado, Boulder.

- EDUC 5595 Practicum in Linguistically Different: English as a Second Language: (four (4) credit hours) Practicum includes 200 hrs of in-school work (can be taken over 2 semester blocks)

Transfer of Credit: *(If you have transfer credits you must complete the Transfer of Credit paperwork)

Students who completed appropriate courses at another institution may transfer credit under the following guidelines. Transfer credits from accredited institutions are accepted by CU Boulder only after approval by the department chair/program director and under the special conditions outlined in the Graduate School Rules. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a non-degree student within the CU system. **The maximum amount of work that may be transferred from another accredited institution to CU Boulder is nine credit hours and is accepted only after approval of the program director. All courses accepted for transfer must be graduate level courses. A course in which a grade of B- or lower was received will not be accepted**

for transfer. Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Educational Equity and Cultural Diversity (EECD): Special Education Generalist & Culturally and Linguistically Diverse Education (CO dual endorsement) MA Degree Plan

(EECD: Special Education Generalist & Culturally and Linguistically Diverse Education MA Degree Plan PDF version (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity/ma-cultural-linguistic-diversityspecial-ed-0>))

A. Requirements for Master's Degree

1. Student must successfully complete 36-37 credit hours of approved coursework while maintaining at least a B (3.0) average in all work attempted while enrolled.
2. Successfully pass their Comprehensive Exam.
3. The master's degree must be completed within four years.

B. Degree Requirements

Course Work Requirements: Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 36-37 credit hours are completed within the four-year limit. Approved coursework meets the following distribution requirements:

Courses and Minimum Required Credit Hours

<i>Course or Requirement:</i>		
EDUC 5465	Introduction to ESL/Bilingual and Special Education	3
EDUC 5505	Education of Students with Learning and Behavior Disorders	3
EDUC 5615	Second Language Acquisition	3
EDUC 5545	Strategies for Teaching Students with Special Needs	3
EDUC 5515	Curriculum and Assessment for Special Learners	3
EDUC 5535	Diagnostic Testing in ESL and Bilingual Education	3
EDUC 5035	Proseminar: Parent and Community Involvement	3
EDUC 5455	Literacy for Linguistically Different Learners	3
EDUC 5625	Methods of Teaching English as a Second Language	3
EDUC 5525	Research Issues in Special Education	3
EDUC 7105	Collaboration to Meet Special Needs	3
Total Credit Hours		33

C. Comprehensive Exam

A written comprehensive examination must be completed during the student's last term of study for the MA degree. The examination will cover the content of all work in the program. Students transferring course

work from other institutions to this program (up to nine credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at the University of Colorado, Boulder.

- Practicum in Bilingual/Special Education (EDUC 5555): 3-4 credit hours

Transfer of Credit: *(If you have transfer credits you must complete the Transfer of Credit paperwork)

Students who completed appropriate coursework at another institution may transfer credit under the following guidelines. Transfer credits from accredited institutions are accepted by CU Boulder only after approval by the department chair/program director and under the special conditions outlined in the Graduate School Rules. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a non-degree student within the CU system. **The maximum amount of work that may be transferred from another accredited institution to CU Boulder is nine credit hours and is accepted only after approval of the program director. All courses accepted for transfer must be graduate level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.** Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Educational Equity and Cultural Diversity - Doctor of Philosophy (PhD)

CU Boulder offers a PhD degree program with an emphasis in educational equity and cultural diversity (EECD). The doctoral program is specifically geared to preparing researchers and leadership personnel in the field of bilingual multicultural education. Program graduates are typically employed in schools of education as faculty and/or researchers. Other graduates also serve in professional positions with state and federal education agencies, as well as local school districts.

Each participant is expected to bring an appropriate master's degree and professional background to the doctoral program. The exact nature of the MA and professional experience required for admission depends upon the career goals of the candidate, but most students bring an MA in bilingual/multicultural education or a related degree and experience in a bilingual classroom.

Candidates in the doctoral program are encouraged to attend full time throughout their program.

For more information, visit the department's Educational Equity & Cultural Diversity (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity>) webpage.

Requirements

Course Requirements

Students must successfully complete 56 credit hours of approved course work, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Educational Equity & Cultural Diversity (<http://www.colorado.edu/education/graduate-programs/educational-equity-cultural-diversity>) webpage.

Required Courses and Semester Credit Hours

Required Core Courses (23 credit hours)

EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6925	Readings in Curriculum and Instruction (First Year: Fall Semester)	1
EDUC 6925	Readings in Curriculum and Instruction (First Year: Spring Semester)	1

Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses) 3

Studies in Educational and Cultural Diversity (15 credit hours)

EDUC 5615	Second Language Acquisition	3
EDUC 5635	Education and Sociolinguistics	3
EDUC 5605	Research Issues in Bilingual Education	3
or EDUC 5525	Research Issues in Special Education	
EDUC 8804	Special Topics (Advanced Doctoral Seminar in EECD)	3
EDUC 8615	Language Issues in Education Research	3

Research and Statistics (6-12 credit hours)

EECD requires a minimum of two courses in advanced methodology, 6-12 preferably aligned with the methods to be used during dissertation research. Eligible courses include:

EDUC 8730	Advanced Qualitative Data Analysis	
EDUC 8348	Seminar: Human Development	
or COMM 64	Discourse Analysis	
EDUC 6504	Issues and Methods in Cognitive Science	
EDUC 7346	Ethnographic Methods in Educational Research	
EDUC 7336	Methods of Survey Research and Assessments	
EDUC 7386	Educational Evaluation	
EDUC 7456	Multilevel Modeling	
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Advanced Topics in Measurement	
EDUC 7396	Categorical Data Analysis	

Other as approved by advisor.

Non-Education Course(s) (3-6 credit hours)

Choose 3-6 credit hours of courses from outside of the School of Education, to be chosen in consultation with your advisor. These courses are typically at the 6000 level or higher. 3-6

Electives (6-12 credit hours)

Choose 6-12 additional credit hours of courses, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. 6-12

Total Credit Hours

53-68

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and associate dean for graduate studies. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Language Requirement

Fulfilled by EDUC 8615 Language Issues in Education Research or examination with EECD faculty.

Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any course work hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their course work. The committee, comprised of three graduate faculty members, must be approved by the associate dean and graduate studies coordinator prior to the exam. The candidacy application should also be submitted at this time.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Prospectus

The dissertation prospectus committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members must also be approved prior to the prospectus. A signature page should be turned in to the graduate studies coordinator upon completion.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Final Defense

The dissertation committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members must also be approved prior to the defense. A signature page and final exam form should be turned in to the graduate studies coordinator upon completion. The complete and revised dissertation should be submitted

to the Graduate School via the Proquest website according to Graduate School semester deadlines.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Time Limit

The doctoral degree must be completed within six years.

Educational Foundations, Policy and Practice

Educational foundations, policy and practice (EFPP) graduate programs focus on policy analysis, curriculum theory, and the application of academic disciplines—anthropology, history, law, philosophy, and sociology—to the analysis of education. Programs are devoted to the critical examination of the relations among education, society, culture and government, with special emphasis on problems of race, gender, sexual diversity, social class and multiculturalism.

The master's program prepares students for further study at the PhD level and to be policy analysts for state and local organizations. The PhD program prepares students for university faculty positions and for policy analysis positions in federal, state, and local organizations.

Concurrent Degree Program: BA in Ethnic Studies + MA in Educational Foundations, Policy and Practice

The new 4+1 Ethnic Studies and Education Concurrent Degree Program offers you an efficient and rigorous path toward earning a Bachelor's Degree in Ethnic Studies and a Master's Degree in Education in five years. The program invites highly focused Ethnic Studies students who are interested in applying their critical thinking skills and dedication to social justice to transformative careers in education.

The program consists of a: MA in Educational Foundations, Policy and Practice for those interested in policy and curricular issues and developing an interdisciplinary lens in graduate level research.

Admissions

You may apply at the beginning of your junior year or at anytime thereafter prior to completion of your undergraduate studies. Applications are submitted to and reviewed by the School of Education.

Applicants must:

- Have declared Ethnic Studies as a major
- Have completed all MAPS requirements
- Have a minimum GPA of 3.0

Applications

- Three letters of reference. Two letters must come from professors with whom you have taken Ethnic Studies or Education courses. The third letter may be from a professor, instructor, or supervisor in a community or educational setting
- Personal Statement

Continuation in the Program

Once admitted, students must:

- Maintain a cumulative GPA of 3.0
- Complete 6 credits of graduate-level coursework by the second semester of senior year

The BA/MA has a required 5-year time limit. You must complete all requirements for the BA by the end of your 8th semester and complete all requirements for the MA by the end of your final 5th year.

Contact Us

Completing the 4+1 program requires careful planning. Consult your advisor early to help chart your degree plan. Contact Education advisors at EdAdvise@colorado.edu or 303-492-6555. Contact Ethnic Studies advisors at EthnicSt@colorado.edu or 303-492-8852.

The School of Education and Department of Ethnic Studies have partnered to support the 4+1 degree program that reflects each unit's commitment to educational opportunity, diversity, and engaged scholarship examining how race and the interrelated categories of ethnicity, disabilities, language, gender, class, and sexuality impact the lives of people locally and globally.

Master's Degree

- Educational Foundations, Policy and Practice - Master of Arts (MA) (p. 1169)

Doctoral Degree

- Educational Foundations, Policy and Practice - Doctor of Philosophy (PhD) (p. 1170)

Educational Foundations, Policy and Practice - Master of Arts (MA)

The master's program in Educational Foundations, Policy and Practice (EFPP) includes two possible concentrations, each with a different focus, but which engage students in a critical examination of the relations among education, society, culture and government, with special emphasis on problems of race, ethnicity, social class, gender, sexual diversity, and multiculturalism. The program stresses analysis of educational theory, policy, and practice by drawing on the humanities and the social sciences. Its foundation is critical scholarship, which examines educational institutions within broad social, political, cultural, legal, and economic contexts in the United States. Program faculty members offer courses in social, cultural, historical, legal, and philosophical foundations of education; policy analysis; evaluation; and curriculum theory. Additional related courses are available in other programs within the School of Education and in other departments of the university.

EFPP has designed its MA as a flexible program with a relatively small size to encourage strong and enduring relationships among students and faculty. The class cohorts represent a wide spectrum of undergraduate majors, geographic locations, previous experiences, and cultural backgrounds. These diverse perspectives enrich the educational environment and expand social awareness.

All MA concentrations are designed to prepare graduates for diverse roles as educators, advocates or policy analysts in schools, government agencies, think tanks, policy organizations, community organizations or institutions of higher education. This program also prepares graduates to pursue PhD work.

Community-Based Change Concentration

Students pursuing an MA focused on community-based change will pursue a course of study to develop expertise in policy analysis, research methods, and program evaluation, as well as specific areas of inquiry such as the process of school reform and the development of partnerships between community members and external participants. This strand of the EFPP MA program is specifically geared toward educators, parents, and other community members who wish to gain skills and knowledge that will assist them in becoming powerful advocates for high-quality, equitable education.

Key foundations courses in this concentration include but are not limited to: Philosophy of Education, Sociology of Education, History of American Education, Education Policy and the Law, and African American Issues in Education.

Evaluation and Policy Analysis Concentration

Students pursuing an MA focused on educational evaluation and policy analysis will pursue a course of study to develop expertise in policy analysis, research methods, and program evaluation, as well as specific areas of inquiry such as the process of school reform and the development of more equitable education policies. The program is designed to prepare evaluators, and policy analysts for careers in academic institutions and agencies at the state and federal levels. Graduates will be able to analyze, recommend, and evaluate public policies effectively.

Key courses in this concentration include but are not limited to: Education Evaluation, Policy Issues in Education, Philosophy of Education, Education Policy and the Law, and Theoretical Issues in Education Policy.

Educational Foundations, Policy and Practice (EFPP) MA Degree Plan

(Educational Foundations, Policy and Practice MA Degree Plan PDF version (<http://www.colorado.edu/education/graduate-programs/educational-foundations-policy-practice-efpp/ma-efpp/degree-requirements>))

A. Requirements for Master's Degree

1. Students must successfully **complete 30 credit hours** of approved coursework while maintaining at least a B (3.0) average in *all* work attempted while enrolled.
2. Successfully pass their Comprehensive Exam.
3. The master's degree must be completed within four years.

B. Degree Requirements

Course Work Requirements: Students develop a degree plan in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year limit.

Courses and Minimum Required Credit Hours

1. Foundations: 15 credit hours

15

Choose at least 15 credit hours in educational foundations, suggested courses:

EDUC 5065	Curriculum Theories	
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6240	Issues in African American Education	
EDUC 6250	Higher Education in the U.S.	
EDUC 6325	Culture and Ethnography in Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8055	Theoretical Issues in Education Policy	
2. Relevant Disciplines Outside the School of Education: 3 credit hours		3
Courses selected with advisor approval from graduate level courses in relevant disciplines outside the School of Education (e.g., 4000-level or higher courses in the Departments of Anthropology, Economics, Ethnic Studies, History, Philosophy, Political Science, or Sociology).		
3. Education Research: 6 credit hours		6
Ordinarily, entering master's level students will take the following two courses to meet this requirement:		
EDUC 5716	Basic Statistical Methods	
EDUC 5726	Introduction to Disciplined Inquiry	
Those who have already taken one or more comparable courses can adjust their course of study accordingly.		
Total Credit Hours		24

C. Electives

Students elect the remaining 4-9 credit hours in consultation with their advisors, depending on the credit distribution in the above categories and the comprehensive examination choice (see Comprehensive Examination Guidelines).

D. Comprehensive Exam

There are two options for satisfying the M.A. Comprehensive Examination requirement: Typically students complete a Take-Home Comprehensive Examination, or in some cases a Major Paper. Each is followed by a 60-90 minute oral examination with the Comprehensive Examination Committee, made up of three faculty members. Students must be registered for credit during the semester they defend their Comprehensive Examination.

Transfer of Credit: *(If you have transfer credits you must complete the Transfer of Credit paperwork)

Students who completed appropriate coursework at another institution may transfer credit under the following guidelines. Transfer credits from accredited institutions are accepted by CU Boulder only after approval by the department chair/program director and under the special conditions outlined in the Graduate School Rules. Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a non-degree student within the CU system. **The maximum amount of work that may be transferred from another accredited institution to CU Boulder is nine credit hours and is accepted only after approval of the program director.**

All courses accepted for transfer must be graduate level courses. A course in which a grade of B- or lower was received will not be accepted for transfer. Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Educational Foundations, Policy and Practice - Doctor of Philosophy (PhD)

The PhD in educational foundations, policy and practice (EFPP) from the CU Boulder School of Education offers an outstanding faculty and program devoted to the critical examination of the relationships between education, society and government, with special emphasis on problems of race, gender, sexual diversity, social class and multiculturalism.

The program stresses analysis and evaluation of education theory, practice and policy by drawing on history, philosophy, law and the social sciences. Its foundation is critical scholarship, which examines educational institutions within broad social, historical, political, cultural, legal and economic contexts in the United States.

Program faculty offer courses on topics such as social, cultural, historical and philosophical foundations of education; policy analysis; evaluation; and curriculum theory. Additional related courses are available in other programs of the School of Education and in other departments of the university.

The program is designed to train scholars, teachers, evaluators and policy analysts for careers in academic institutions and agencies at the state and federal levels.

For more information, visit the department's Educational Foundations, Policy & Practice (<http://www.colorado.edu/education/graduate-programs/educational-foundations-policy-practice>) webpage.

Requirements

Course Requirements

Students must successfully complete 56 credit hours of approved course work, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/educational-foundations-policy-practice-efpp/phd-efpp/degree-requirements>) webpage.

Required Courses and Semester Credit Hours

Required Core Courses

EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3

EDUC 6925	Readings in Curriculum and Instruction (First year: Fall Semester)	1
EDUC 6925	Readings in Curriculum and Instruction (First year: Spring Semester)	1

Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses) 3

Educational Foundations Courses

Choose at least 18 credit hours of courses in consultation with your advisor. Eligible courses include: 18

EDUC 5605	Research Issues in Bilingual Education	
EDUC 5075	Sociology in Education	
EDUC 5085	History of American Education	
EDUC 6210	Education Policy and the Law	
EDUC 6220	Gender Issues in Education	
EDUC 6230	Ethics in Education	
EDUC 6240		
EDUC 6250	Higher Education in the United States	
EDUC 6325	Culture and Ethnography in Education	
EDUC 7055	Philosophy of Education	
EDUC 7446	Seminar: Policy Issues in Education	
EDUC 8025	Seminar: Curriculum Theories	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8055	Theoretical Issues in Education Policy	

Research Methods

Choose at least 9 credit hours of advanced qualitative or quantitative research methods courses within or outside of the School of Education in consultation with your advisor. Eligible courses include: 9

COMM 6410	Discourse Analysis	
EDUC 7386	Educational Evaluation	
EDUC 7396	Categorical Data Analysis	
EDUC 7456	Multilevel Modeling	
EDUC 8710	Measurement in Survey Research	
EDUC 8720	Advanced Topics in Measurement	
EDUC 8730	Advanced Qualitative Data Analysis	
SOCY 7026	Feminist Research Methods	
SOCY 7121	Qualitative Analysis	

Electives

Choose at least 6 additional credit hours of courses, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. 6

Total Credit Hours 56

¹ Students concentrating in History of Education or Philosophy of Education may choose to fulfill this requirement with courses in historiography or philosophical inquiry, respectively.

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and associate dean for graduate

studies. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Language Requirement

Please see the *Graduate Student Handbook* (<http://www.colorado.edu/education/node/522/attachment/newest>) for more information on this requirement.

Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any course work hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their course work. The committee, comprised of three graduate faculty members, must be approved by the associate dean and graduate studies coordinator prior to the exam. The candidacy application should also be submitted at this time.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Prospectus

The dissertation prospectus committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members must also be approved prior to the prospectus. A signature page should be turned in to the graduate studies coordinator upon completion.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Final Defense

The dissertation committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members must also be approved prior to the defense. A signature page and final exam form should be turned in to the graduate studies coordinator upon completion. The complete and revised dissertation should be submitted

to the Graduate School via the Proquest website according to Graduate School semester deadlines.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Time Limit

The doctoral degree must be completed within six years.

Educational-Learning Sciences and Human Development

The Learning Sciences and Human Development program takes an interdisciplinary approach to understanding learning, teaching and the organizing of activities for learning. Our program, based in the fields of learning sciences and human development, is particularly concerned with learning and development in and across school and out-of-school contexts and with intersections between learning and policy. We have a strong commitment to and record of working successfully with school and community partners to organize innovative practices that open up opportunities for transformative learning.

The CU Boulder Learning Sciences and Human Development program is on the leading edge of the field in its theoretical and practical explorations of issues of social and spatial justice, culture and diversity in learning. We are also leaders in theorizing and building partnerships with schools, districts and state agencies, as well as youth and community organizations.

Master's Degree

- Learning Sciences and Human Development - Master of Arts (MA) (p. 1172)

Doctoral Degree

- Learning Sciences and Human Development - Doctor of Philosophy (PhD) (p. 1173)

Education-Learning Sciences and Human Development - Master of Arts (MA)

The Learning Sciences and Human Development Department's master's program focuses on research, theory and professional knowledge, with an emphasis on learning and teaching in K–12 educational settings. The program is structured in accordance with a scientist-practitioner model, with primary emphasis given to academic study and research.

Learning Sciences and Human Development Department faculty members and students collaborate to facilitate the development of research, theory and professional knowledge with an emphasis on learning and teaching in K–12 educational settings. All students develop an academic foundation that prepares them for further study at the PhD level, work in K–12 education or employment in the private sector. In addition, faculty advisors and students build programs of study that meet both the program goals and the student's interests.

Requirements

Prerequisites

Minimum of two upper-level undergraduate courses related to learning and human development. For example, courses in psychology, sociology or education that touch on topics such as how people learn, cognition and the social and cultural contexts of development including the study of culture, race, ethnicity, gender or linguistics would be relevant.

Minimum of two courses related to learning in the disciplines in one of the following areas: literacy, history, mathematics, science or engineering.

General Requirements

Students must successfully complete 30 credit hours of approved course work while maintaining at least a B (3.0) average in all work attempted while enrolled.

Students develop a degree plan (Plan I or Plan II) in consultation with their faculty advisor, typically in their first semester. The frequency of individual course offerings varies; therefore, candidates should plan ahead so that the required 30 credit hours are completed within the four-year limit.

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 9 credit hours, and is accepted only after approval of the department chair/program director and under the special conditions outlined in the Graduate School Rules. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Required Courses

Core Requirements

EDUC 5716	Basic Statistical Methods	3
EDUC 5726	Introduction to Disciplined Inquiry	3
EDUC 6318	Psychological Foundations of Education	3
EDUC 6328	Advanced Child Growth and Educational Development	3

Core Electives

Choose at least 9 additional credit hours of courses at the 5000 level or above from within the School of Education, to be chosen from the following categories in consultation with your advisor.¹

Learning and Development
Curriculum and Instruction
Learning and Technology Foundations

Total Credit Hours	21
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¹ GRTE courses may not count toward a master's degree.

Suggested Electives

Learning and Development

EDUC 8358 Seminar: Human Learning

EDUC 8348 Seminar: Human Development

Curriculum and Instruction

EDUC 5105 Teaching for Understanding and Equity

Learning and Technology

See special topics courses.

Foundations

EDUC 7055 Philosophy of Education

Additional Electives

The following are courses offered through the School of Education that provide opportunities to learn about learning and teaching in schools:

EDUC 5065 Curriculum Theories

EDUC 5235 Language and Literacy Across the Curriculum

EDUC 5205 Elementary Mathematics Theory and Methods

EDUC 5315 Perspectives on Science

EDUC 5316 Nature of Social Studies and Social Studies Education

EDUC 5317 Perspectives on Mathematics

Degree Plans

Plan I: Thesis Option

In addition to the required courses above, students choosing Plan I must take an additional 6 credit hours of electives, to be chosen in consultation with their advisor, and complete 4 credit hours of EDUC 6954 Master's Thesis.

Plan II: Comprehensive Examination Option

In addition to the required courses above, students choosing Plan II must take an additional 12 credit hours of electives, to be chosen in consultation with their advisor, and complete a 4-credit-hour written comprehensive examination during their last term of study for the MA degree. The examination covers the content of all work in the program. Students transferring course work from other institutions to this program (up to nine credit hours may be taken at other approved institutions) are responsible for the same knowledge as those whose work has been taken entirely at CU Boulder.

Time Limit

The master's degree must be completed within four years.

Education-Learning Sciences and Human Development - Doctor of Philosophy (PhD)

Faculty and students in CU Boulder's learning sciences and human development PhD program study how people learn in the context of organizing for more equitable, sustainable social futures. Researchers consider how the practice of research can inform social change that can improve learning and teaching for K–12 students and their teachers, for undergraduates and the organization of higher education pathways, and in community contexts. Working in partnership with school and community partners is a key component of the approach we take to understanding educational problems and their possible solutions.

The learning sciences and human development (LSHD) PhD program prepares graduate students to research and inform collective efforts to improve conditions of learning, particularly for young people from non-dominant communities and the adults (including teachers, community organizers and community members) who work with them. The program emphasizes:

- how a strong foundation in psychological perspectives on education and human development can inform efforts to improve conditions for learning in school and out of school contexts;
- the need to go beyond psychological perspectives to interpret learning and development in social, cultural and historical contexts;
- social justice as a central concern in studying and informing efforts to improve conditions of learning; and
- humanistic approaches to research that draw on interpretive, phenomenological and social practice theories of human action.

Students work with faculty members who conduct research in a range of settings, including schools, preservice teacher education programs, afterschool programs, museums, community organizations, workplaces and grassroots social movements.

For more information, visit the department's PhD in Learning Sciences & Human Development (LSHD) (<http://www.colorado.edu/education/degree/phd-learning-sciences-human-development-lshd>) webpage.

Requirements

Course Requirements

Student must successfully complete 56 credit hours of approved course work, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/learning-sciences-human-development/phd-lshd/degree-requirements>) webpage.

Required Courses

Required Core Courses

EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6925	Readings in Curriculum and Instruction ((First Year: Fall semester))	1
EDUC 6925	Readings in Curriculum and Instruction ((First Year: Spring semester))	1

Advanced Seminar in Democracy, Diversity and Social Justice (select from a faculty-approved list of courses) 3

Advanced Topics in Learning Sciences and Human Development

Choose 12 additional credit hours of courses with your advisor's approval from the following: 12

EDUC 8135 Seminar: Research on Teaching

EDUC 8348	Seminar: Human Development (may be repeated for credit)
EDUC 8358	Seminar: Human Learning (may be repeated for credit)
<hr/>	
Total Credit Hours	35

Electives

Choose 21 credit hours of graduate-level courses with your advisor's approval. Of these, least 6 credit hours must be outside learning sciences and human development, and must be courses other than those used to satisfy the core requirements and the advanced topics requirements. Note: These electives may be used to satisfy requirements toward the Institute for Cognitive Sciences certificate (p. 951).

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and associate dean for graduate studies. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Language Requirement

Please see the *Graduate Student Handbook* (<http://www.colorado.edu/education/node/522/attachment/newest>) for more information on this requirement.

Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any course work hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their course work. The committee, comprised of three graduate faculty members, must be approved by the associate dean

and graduate studies coordinator prior to the exam. The candidacy application should also be submitted at this time.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Prospectus

The dissertation prospectus committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the School but within CU Boulder. These members must also be approved prior to the prospectus. A signature page should be turned in to the graduate studies coordinator upon completion.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Final Defense

The dissertation committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members must also be approved prior to the defense. A signature page and final exam form should be turned in to the graduate studies coordinator upon completion. The complete and revised dissertation should be submitted to the Graduate School via the Proquest website according to Graduate School semester deadlines.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Time Limit

The doctoral degree must be completed within six years.

Research and Evaluation Methodology

The research and evaluation methodology (REM) program offers a way to combine substantive interests about education with advanced training in research methods. A central mission of the program is to give students the training they need to use sophisticated methods that shed light on policies, programs and practices that have been enacted to facilitate student learning and to mitigate educational inequality. You will learn not only how to apply a methodological approach, but to think deeply about when and why the approach is sensible given the real-world context that motivated the need for research. Learning how to do high quality research is just one piece of the puzzle. Communicating your findings with clarity is another. In REM, you will develop the ability to convey the results from complicated studies to a broad audience.

A spirit of critical inquiry is a defining feature of our community. When claims about education are made—by students or faculty—it is expected that those claims will be supported by an empirical warrant. Our faculty strive to foster an environment for students that is at once challenging and supportive. During our weekly "REM seminar," you have the opportunity to interact with invited speakers, discuss timely research topics and studies, brainstorm ideas for publishable papers, and practice giving oral presentations. Close contact between students and faculty is the rule, not the exception. We teach courses and mentor students with the same commitment and dedication that is evident in our scholarly research. You can expect to experience on-going support as you embark on a path that begins with coursework, transitions to dissertation

prospectus and defense, and culminates in a job that meshes with your career aspirations.

REM Students

The REM program is a place for intellectually curious and motivated students who want to learn about deep research methodology with an eye toward influencing education policy and practice. The most common methodological specializations are in (1) psychometrics and educational assessment and (2) applied statistics. The program is a full-time commitment, and all admitted students are supported with five years of funding, including tuition remission and a stipend for living expenses. You will participate in graduate research assistantships each semester and can expect to work with faculty on research projects as part of CADRE.

The Center for Assessment, Design, Research and Evaluation (CADRE)

All REM students can expect to be involved in CADRE research. The mission of CADRE is to produce generalizable knowledge that improves the ability to assess student learning and to evaluate programs and methods that may have an effect on this learning. CADRE projects represent a collaboration with the ongoing activities in the School of Education, the University, and the broader national and international community of scholars and stakeholders involved in educational assessment and evaluation. View examples of CADRE projects (<http://www.colorado.edu/cadre/cadre-projects-and-resources>).

Doctoral Degree

- Education - Research and Evaluation Methodology - Doctor of Philosophy (PhD) (p. 1175)

Education - Research and Evaluation Methodology - Doctor of Philosophy (PhD)

The PhD program in research and evaluation methodology (REM) offers a way to combine substantive interests about education with advanced training in research methods. A central mission of the program is to give students the training they need to use sophisticated methods that shed light on policies, programs and practices that have been enacted to facilitate student learning and to mitigate educational inequality. Students learn not only how to apply a methodological approach, but to think deeply about when and why the approach is sensible given the real-world context that motivated the need for research. Learning how to do high quality research is just one piece of the puzzle. Communicating findings with clarity is another. In REM, students develop the ability to convey the results from complicated studies to a broad audience.

A spirit of critical inquiry is a defining feature of our community. When claims about education are made—by students or faculty—it is expected that those claims will be supported by an empirical warrant. Our faculty strive to foster an environment for students that is at once challenging and supportive. During our weekly REM seminar, students have the opportunity to interact with invited speakers, discuss timely research topics and studies, brainstorm ideas for publishable papers and practice giving oral presentations. Close contact between students and faculty is the rule, not the exception. We teach courses and mentor students with the same commitment and dedication that is evident in our scholarly research. Students can expect to experience ongoing support

as they embark on a path that begins with course work, transitions to dissertation prospectus and defense, and culminates in a job that meshes with the student's career aspirations.

REM Students

The REM program is a place for intellectually curious and motivated students who want to learn about deep research methodology with an eye toward influencing education policy and practice. The most common methodological specializations are:

- psychometrics and educational assessment
- applied statistics

The program is a full-time commitment, and all admitted students are supported with five years of funding, including tuition remission and a stipend for living expenses. Students participate in graduate research assistantships each semester and can expect to work with faculty on research projects as part of CADRE.

The Center for Assessment, Design, Research and Evaluation (CADRE)

All REM students can expect to be involved in CADRE research. The mission of CADRE is to produce generalizable knowledge that improves the ability to assess student learning and to evaluate programs and methods that may have an effect on this learning. CADRE projects represent a collaboration with the ongoing activities in the School of Education, the University, and the broader national and international community of scholars and stakeholders involved in educational assessment and evaluation. Visit the center's CADRE Projects and Resources (<http://www.colorado.edu/cadre/cadre-projects-and-resources>) webpage for examples.

Career Opportunities

Opportunities for students with a PhD from REM include:

- university teaching and research
- research, evaluation and testing in state departments of education and large school districts
- research and policy analysis for think tanks like the RAND Corporation, SRI International, and federally funded regional research and development laboratories
- measurement or statistical analysis for assessment and testing organizations such as the Educational Testing Service
- consultation for government and education agencies

Examples of our REM graduates' careers over the past 10 years:

- National Center for the Improvement of Educational Assessment (Senior Associate)
- Educational Testing Service (Research Scientist)
- Center for Assessment, Design, Research and Evaluation (Associate Director)
- SRI International (Principal Research Scientist)
- Stanford University (Assistant Professor)

Requirements

Course Requirements

Students must successfully complete 56 credit hours of approved course work, with 23 credit hours of core courses (see below) taken as a doctoral cohort during the first two years of study. Students must maintain at least a B (3.0) average with no grade lower than a B- while enrolled.

Students must complete 30 hours of dissertation credit. Students must be registered for a minimum of 5 dissertation hours per semester after successful completion of their comprehensive exam.

For more information, visit the department's Degree Requirements (<http://www.colorado.edu/education/graduate-programs/research-evaluation-methodology/phd-rem/degree-requirements>) webpage.

Required Courses

Required Core Courses

EDUC 8230	Quantitative Methods I	3
EDUC 8250	Qualitative Methods I	3
EDUC 8210	Perspectives on Classroom Teaching and Learning	3
EDUC 8240	Quantitative Methods II	3
EDUC 8260	Qualitative Methods II	3
EDUC 8220	Introduction to Educational Research and Policy	3
EDUC 6926	Readings in Research and Evaluation Methodology (First year: Fall Semester)	1
EDUC 6926	Readings in Research and Evaluation Methodology (First year: Spring Semester)	1
Advanced Seminar in Democracy, Diversity & Social Justice (select from a faculty-approved list of courses)		3

REM Courses

EDUC 7396	Categorical Data Analysis	3
EDUC 7456	Multilevel Modeling	3
EDUC 8710	Measurement in Survey Research	3
EDUC 8720	Advanced Topics in Measurement	3
EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	3
EDUC 7386	Educational Evaluation	3
Total Credit Hours		41

Electives

Choose at least 15 additional credit hours of courses from within the School of Education, to be chosen in consultation with your advisor and in the context of your interests and developing expertise. Eligible courses include:

EDUC 6210	Education Policy and the Law	
EDUC 7055	Philosophy of Education	
EDUC 8045	Philosophical Issues in Educational Research	
EDUC 8055	Theoretical Issues in Education Policy	
EDUC 8740	Advances in the Assessment of Student Learning	
EDUC 8615	Language Issues in Education Research	
EDUC 8730	Advanced Qualitative Data Analysis	
ECON 7818	Mathematical Statistics for Economists	
ECON 7828	Econometrics	
MATH 4510	Introduction to Probability Theory	
MATH 5520	Introduction to Mathematical Statistics	
or APPM 5520	Introduction to Mathematical Statistics	

SOCY 6111 Data 2: Data Analysis

SOCY 7111 Data III--Advanced Data Analysis

Total Credit Hours 15

Transfer Credit

Transfer credit is defined as any credit earned at another accredited institution, credits earned on another campus of the CU system, or credits earned as a nondegree student within the CU system. Students who have transfer credits must complete the transfer of credit paperwork.

The maximum amount of work that may be transferred from another accredited institution to CU Boulder is 12 credit hours, and is accepted only after approval of the faculty advisor and associate dean for graduate studies. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

Transfer course work must have been completed in the five years prior to acceptance to the program. Credit may not be transferred until the student has completed 6 credits of graduate-level course work as a degree-seeking student on the CU Boulder campus with a 3.0 GPA.

Language Requirement

Please see the *Graduate Student Handbook* (<http://www.colorado.edu/education/node/522/attachment/newest>) for more information on this requirement.

Dissertation Credit

All doctoral students must take a minimum of 30 dissertation hours (EDUC 8994 PhD Doctoral Dissertation).

Students are allowed to take up to 10 hours prior to passing their comprehensive exam. Once students pass their comprehensive exam, they must be registered for a minimum of 5 dissertation hours every semester. Students may be registered for 3 hours if they are "off-campus" status, meaning they are not on appointment and are not taking any course work hours.

Students must be registered for a minimum of 5 dissertation hours during the semester they defend.

Scholarly Project

All doctoral students are required to complete, at minimum, one scholarly project prior to taking the comprehensive exam. Presentations at professional meetings, published articles, reviews, etc., are typical ways to satisfy the requirement.

Comprehensive Exam

The comprehensive exam should be taken after students have completed the majority of their course work. The committee, comprised of three graduate faculty members, must be approved by the associate dean and graduate studies coordinator prior to the exam. The candidacy application should also be submitted at this time.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Prospectus

The dissertation prospectus committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members

must also be approved prior to the prospectus. A signature page should be turned in to the graduate studies coordinator upon completion.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Final Defense

The dissertation committee should be comprised of four School of Education graduate faculty members and one graduate faculty member from outside the school but within CU Boulder. These members must also be approved prior to the defense. A signature page and final exam form should be turned in to the graduate studies coordinator upon completion. The complete and revised dissertation should be submitted to the Graduate School via the Proquest website according to Graduate School semester deadlines.

Committee members must receive approval from the School of Education prior to the exam. Please check the deadlines sheet for dates.

Time Limit

The doctoral degree must be completed within six years.

Teacher Licensure Program

The School of Education offers course work leading to initial Colorado licensure to undergraduate, post-baccalaureate and master's degree students. Colorado requires public school teachers to be licensed by its state department of education. Students who successfully complete all School of Education requirements will be recommended for a Colorado provisional (initial) teaching license, the license issued to all new teachers in Colorado. Licensure requirements vary from state to state and from teaching area to area. Students who are interested in teaching in other states should familiarize themselves with the requirements of those states so they may plan an appropriate degree program.

Teacher education at the University of Colorado, while administered by the School of Education, is a university-wide function. Many academic departments provide course work that supports the teacher in training. Undergraduate students follow a prescribed set of courses that meet state content preparation standards, complete a major and satisfy professional education requirements concurrently. The program involves a combination of courses at the university and K–12 school placements.

Undergraduate (p. 608) and Post-Baccalaureate (p. 600) (Non-master's Degree) Teacher Licensure Programs

- Elementary Education (K–6)
- Secondary Education (7–12) fields:
 - English Language Arts
 - Mathematics
 - Science
 - Social studies
 - World language (French, German, Japanese, Latin, Russian or Spanish)
- Music Education (K–12)

Secondary Master's Degree Plus Teacher Licensure Program (p. 1177) (MA+)

- Secondary Education (7–12) fields:
 - English Language Arts
 - Mathematics
 - Science
 - Social Studies

Program Mission and Commitments

The School of Education prepares educators who are able to enact commitments to social justice and equitable access to deep content learning in school, family and community contexts.

The following principles guide our work in preparing the next generation of educators:

- Teachers must position students as sense-makers and knowledge-generators, who desire to invest and succeed in school. This involves noticing children/youth, building relationships with them, valuing their perspectives and attending to their thinking, curiosities and capabilities.
- Teaching is both intellectual work and a craft. Deep knowledge of content and pedagogy, creativity and passion fuel both learning and teaching.
- Teachers must design equitable learning environments in which all children are engaged in robust and consequential learning.
- Teacher's instruction and student learning is always conducted within the context of larger social systems, structures and hierarchies.
- What we do and say matters and must be analyzed. Our language and action constructs or constrains opportunities for children to build meaningful, positive and sustained relationships to learning and one another.

Colorado Teacher Quality Standards

Teacher education candidates engage in a planned sequence of courses and accompanying clinical experiences in local community and school sites. Courses and assessments ensure candidates have demonstrated appropriate mastery of (1) content taught in the Colorado Academic Standards and (2) professional practices and dispositions associated with the Colorado Teacher Quality Standards listed below.

1. Teachers demonstrate mastery of and pedagogical expertise in the content they teach.
2. Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.
3. Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.
4. Teachers reflect on their practice.
5. Teachers demonstrate leadership.
6. Teachers take responsibility for student academic growth.

Admission Requirements

Students who already hold a bachelor's degree and wish to pursue licensure should apply directly to the School of Education. Students desiring institutional recommendation for licensure must complete at least 30 credit hours of work at the University of Colorado and also must fulfill the same content area requirements as undergraduate students.

The actual number of required credit hours will depend on courses already completed.

Students may apply to one of the teacher education programs if the following requirements have been fulfilled:

1. **GPA:** Elementary and Secondary students must have and maintain a 2.75 (on a 4.00 scale) cumulative GPA, 2.75 at CU-Boulder, 2.75 in their subject area (Secondary teacher fields) and 2.75 in education. Music Education (K-12) students must have and maintain a 3.00 overall and in their subject area. Students applying to Master's Plus (MA+) programs must have and maintain a 3.00 cumulative GPA.
2. **Prior Degrees:** Students applying to Post-Baccalaureate and Master's Plus (MA+) programs must have a bachelor's degree from an accredited institution.
3. **Youth Experience:** Students must provide written verification of 25 clock hours of satisfactory experiences with elementary, middle/junior high or senior high school-aged youth (appropriate to the desired program) in the past five years. Forms for this purpose are available in the Office of Student Services, Education 151, or online at the School of Education (<http://www.colorado.edu/education/prospective-students>) website. Undergraduate students at CU Boulder meet this requirement through school experiences in EDUC 2020 Step 1: Inquiry Approaches to Teaching or EDUC 2030 Step 2: Inquiry-Based Lesson Design courses.
4. **Basic Skills:** All teacher education students must demonstrate basic skills competence in mathematics and literacy. This may be done through acceptable grades in appropriate college course work, or by acceptable standardized test scores.
5. **Letters of Recommendation.** Contact the Office of Student Services in Education 151 for more information.
6. **Personal Statement.** Contact the Office of Student Services in Education 151 for more information.
7. **Background Check and Fee:** The School of Education and our partner districts require students working in schools to undergo background checks at least once per year. The costs and process for these background checks are changing due to new state requirements. Check with the Office of Student Services for the most updated information.
8. **Application Fee:** The appropriate application fee should be submitted with application materials. Fees vary by program.

Individuals interested in completing the teacher education program at the University of Colorado Boulder should request application materials from the Office of Student Services, Education 151 or online at the School of Education (<http://www.colorado.edu/education>) website. Students currently enrolled in a degree program at Boulder will need to complete an application.

Individuals who have completed a baccalaureate degree at an accredited institution and are not currently enrolled at the university must complete a program application, a university application and submit official transcripts from all previous colleges directly to the University's Office of Admissions (<http://www.colorado.edu/admissions>).

Advising

Students are responsible for obtaining and reading the appropriate undergraduate or graduate student handbook (<http://>

www.colorado.edu/education/current-students/forms-policies). Off-campus students may obtain advising materials online (<http://www.colorado.edu/education/prospective-students>) or by calling 303-492-6555.

At CU Boulder, degree requirements vary among the schools and colleges. Students seeking a degree at the University of Colorado should consult, as soon as possible, with an advisor in the college or school from which they expect to graduate and with the School of Education advisor (edadvice@colorado.edu).

Students are encouraged to become familiar with the teacher education requirements by comparing their own transcripts to the published advising materials. Students can then talk with an advisor before applying to the program or they may wait until after their applications are processed. Students seeking teacher licensure in French, German, Japanese, Latin, Russian, Spanish or music should see the designated advisor for that content area in addition to the School of Education advisor.

Advising may also be obtained through email at edadvice@colorado.edu. When requesting email advising, please make questions as specific as possible.

MA+ Secondary English Language Arts (7-12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirement

Courses and Minimum Required Credit Hours

Mathematics: College-level mathematics.	3
Social Science	3
Natural Science	3
Advanced Writing: Critical or creative writing beyond the lower-division/introductory composition level.	3
History or Grammar of the English Language: Including or equivalent to EDUC 4222/EDUC 5222, CLAS 1010/LING 1010, LING 1500, or LING 2000.	3
Oral Communication: Includes speech, public speaking, or communication courses.	3
Visual Communication: Includes theatre, film, offerings from ATLAS, TAM or other digital media courses.	3
Literature: Must include a component of British literature as well as a multicultural/non-English literature.	9
Thirty (30) credit hours in English and English Language Arts related courses.	30
Acceptable coursework may be in Communication/Speech, Composition, Drama/Theatre, Humanities, Journalism, and/or Literature. (May include courses from the content requirements above.)	
Recent English coursework in the past five (5) years.	6

Education Course Requirements

Semester One

EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5295	Reading and Literacy in the Secondary Classroom	4

EDUC 5345	Writing in Humanities Classrooms	4
EDUC 5325	Teaching Literature in Middle and Secondary Schools	3
Semester Two		
EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5365	Methods and Materials in Secondary English	4
Semester Three		
Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.		
EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10
Semester Four		
Additional nine (9) graduate credits to complete the Masters Degree. If you have a teaching position during this semester, you only need to take one course and are able to finish the master's degree over the next academic year.		
Total Credit Hours		45

Basic Skills: Prior to Student Teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to Student Teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5038) or PLACE (test 07).

edTPA: During Student Teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

MA+ Secondary Math (7-12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Writing: Three credit hours in writing or composition in English.	3
Humanities: Literature, Philosophy, Theater	3
Social Science	3
Natural Science	3
Calculus 1	4
Calculus 2	4
Calculus 3: APPM 2350 or MATH 2400.	4
Linear Algebra	3
Functions & Modeling/Analysis/Abstract Mathematics: One (1) course in functions and modeling, analysis, or topology.	3

Geometry: One (1) course in modern geometry.	3
Probability & Statistics: One (1) course in probability theory and mathematical statistics.	3
Twenty-four (24) credit hours in Math or Applied Math coursework. Eighteen (18) of the required thirty hours above must be completed at the sophomore level or higher. (May include requirements above).	24
Recent Mathematics coursework in the past five (5) years. (May include requirements above and EDUC 5317)	6

Education Course Requirements

Courses and Minimum Required Credit Hours

<i>FIRST SEMESTER</i>		
EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5060	Classroom Interactions	3
EDUC 5317	Perspectives on Mathematics	3
<i>SECOND SEMESTER</i>		
EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5235	Language and Literacy Across the Curriculum	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5375	Problem-Based Math Instruction	4
<i>THIRD SEMESTER</i>		
Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.		
EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10
<i>FOURTH SEMESTER</i>		
Additional nine (9) graduate credits to complete the Masters Degree. If you have a teaching position during this semester, you only need to take one course and are able to finish the Masters Degree over the next academic year.		
Total Credit Hours		43

Basic Skills: Prior to student teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to student teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5161) or PLACE (test 04).

edTPA: During student teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

MA+ Secondary Science (7-12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Written Communication: Three credit hours in college-level composition or writing.	3
Humanities: Literature, Philosophy, Theater	3
Social Science	3
Calculus I	4
Two (2) Biology courses.	
Two (2) Chemistry courses.	
Two (2) Earth/Space Science courses.	
Two (2) Physics courses.	
<i>Complete three (3) out of four (4) content area lab courses:</i>	
Biology Lab	
Earth/Space Science Lab	
Chemistry Lab	
Physics Lab	

Courses and Minimum Required Credit Hours

FIRST SEMESTER

EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5295	Reading and Literacy in the Secondary Classroom	4
EDUC 5345	Writing in Humanities Classrooms	4
EDUC 5325	Teaching Literature in Middle and Secondary Schools	3

SECOND SEMESTER

EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5365	Methods and Materials in Secondary English	4

THIRD SEMESTER

Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10

FOURTH SEMESTER

Additional nine (9) graduate credits to complete the Masters Degree.	9
If you have a teaching position during this semester, you only need to take one course and are able to finish the Masters Degree over the next academic year.	

Total Credit Hours 45

Education Course Requirements

Courses and Minimum Required Credit Hours

FIRST SEMESTER

EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5060	Classroom Interactions	3
Complete one (1) of the following courses:		3
EDUC/PHYS 5460	Teaching and Learning Physics	
EDUC 5833	Teaching and Learning Earth Systems	

EDUC 5822	Teaching and Learning Chemistry	
EDUC 6811	Teaching and Learning Biology	
EDUC 5580	Physics and Everyday Thinking	

SECOND SEMESTER

EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5235	Language and Literacy Across the Curriculum	3
EDUC 5385	Problem-Based Science Instruction	4

THIRD SEMESTER

Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10

FOURTH SEMESTER

Additional nine (9) graduate credits to complete the Masters Degree.	9
If you have a teaching position during this semester, you only need to take one course and are able to finish the Masters Degree over the next academic year.	

Total Credit Hours 43

Basic Skills: Prior to student teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to student teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5435) or PLACE (test 05).

edTPA: During student teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

MA+ Secondary Social Studies (7-12) Teacher Licensure Program

Teacher licensure candidates must maintain a 3.0 GPA in cumulative, content and education course work. All grades must be a C- or better to satisfy a requirement.

Content Course Work Requirements

Courses and Minimum Required Credit Hours

Mathematics: College-level mathematics.	3
Writing: Three (3) credit hours in writing or composition.	3
Humanities: Literature, Philosophy, Theater	3
Natural Science	3
US History	6
World History	6
Economics: Must be completed in the Economics department.	3
Political Science: Economics: Must be completed in the Political Science department.	3

Cultural/Human Geography: Must be completed in the Geography department. Physical Geography does NOT qualify.	3
Sociology or Social/Cultural Anthropology: Must be completed in the Sociology or Anthropology department. Physical Anthropology does NOT qualify.	3
Thirty (30) credit hours of coursework in one (1) of the following disciplines: Anthropology, Economics, Ethnic Studies, Geography, History, International Affairs, or Political Science. A minimum of 12 credit hours must be upper division. (May include courses from the content requirements above.)	30
Recent Social Studies coursework in the past five (5) years.	6

Education Course Requirements

Courses and Minimum Required Credit Hours

FIRST SEMESTER

EDUC 5005	Advanced Social Foundations of Education	3
EDUC 5295	Reading and Literacy in the Secondary Classroom	4
EDUC 5316	Nature of Social Studies and Social Studies Education	3
EDUC 5345	Writing in Humanities Classrooms	4

SECOND SEMESTER

EDUC 6368	Adolescent Psychology and Development for Teachers	3
EDUC 5485	Differentiation in the Classroom	3
EDUC 5355	Methods and Materials in Secondary Social Studies	3-4

THIRD SEMESTER

Student Teaching: Satisfactory completion of all content and education course requirements is a prerequisite for student teaching. No other courses may be taken during the student teaching semester.

EDUC 4513	Education and Practice (Must be taken with EDUC 4712.)	2
EDUC 4712	Student Teaching: Secondary School (Must be taken with EDUC 4513.)	10

FOURTH SEMESTER

Additional nine (9) graduate credits to complete the Masters Degree. 9
If you have a teaching position during this semester, you only need to take one course and are able to finish the Masters Degree over the next academic year.

Total Credit Hours 44-45

Basic Skills: Prior to student teaching

Complete an appropriate, college-level math *and* composition course with a B- or better. Acceptable scores on the ACT, SAT, GRE or Praxis CORE exam will also satisfy the requirement.

Required Tests and Assessments

Licensure Exam: Prior to student teaching

Pass either state-approved licensure exam, PRAXIS Subject Assessment (test 5081) or PLACE (test 06).

edTPA: During student teaching

Pass the edTPA, a performance-based, subject-specific assessment, with a score of 42 or higher.

Engineering & Applied Science

The College of Engineering and Applied Science has a tradition of excellence in engineering education dating back to 1893, and we continually update and improve our programs to reflect the highest standards in teaching and learning, discovery and innovation, and community and culture. We are the top-ranked engineering school in the Rocky Mountain region, with 14 baccalaureate programs and 12 graduate programs offering more than 35 degrees.

Mission & Vision

The mission of the College of Engineering and Applied Science (<http://www.colorado.edu/engineering>) is to generate new knowledge in engineering and related fields and to equip students from diverse backgrounds as future leaders and responsible citizens in these fields for the betterment of individuals and society. Its vision is to be a world leader in engineering research and education, with an emphasis on integrated and discovery learning and on engineering for global society.

The college embraces the following core values:

- **Global Society:** Our innovative research programs seek to create and disseminate knowledge to improve global society in areas such as health and well-being, energy and environmental sustainability and infrastructure for both developed and developing communities. Similarly, our innovative educational programs seek to prepare graduates with not only technical knowledge and excellence, but also skills for societal leadership and global citizenship.
- **Active Learning:** We design the student experience based on engineering educational research findings that demonstrate enhanced learning through active engagement of students, both within the classroom and through personalized and team-based opportunities such as design projects, discovery learning, service learning, internships and leadership programs.
- **Inclusive Excellence:** To improve the educational experience and better serve global society, we are committed to building a culture of inclusive excellence of diverse faculty, staff and students with high ethical and performance standards.

The college seeks the following outcomes in our graduates:

- Technical excellence and knowledge in modern engineering, mathematics and science
- Ability to communicate effectively with diverse peoples and other cultures
- Ability to think critically, analyze data and formulate and solve complex problems
- Ability to contribute effectively as individuals and in multidisciplinary teams
- Knowledge of contemporary issues and preparation for societal leadership and world citizenship
- Desire and skills for lifelong learning and personal and professional development
- Passion for serving others and commitment to sustainability

Degree Programs

Graduate degrees are offered in the following areas:

1. aerospace engineering sciences (p. 1183)
2. architectural engineering (p. 1195)

3. chemical engineering (p. 1198)
4. civil engineering (p. 1202)
5. computer science (p. 1216)
6. electrical engineering (p. 1227)
7. engineering management (p. 1244)
8. environmental engineering (p. 1249)
9. materials science and engineering (p. 1251)
10. mechanical engineering (p. 1252)
11. technology, media, and society (p. 1261)
12. interdisciplinary telecommunications (p. 1265)

Policies & Requirements

Academic Excellence

Graduate study in engineering at the University of Colorado Boulder offers a challenging, collaborative environment with exceptional possibilities. Graduate education at the College of Engineering & Applied Science involves the creation and dissemination of knowledge in many forms.

Academic Standards

Academic Policies

College of Engineering and Applied Science graduate students must abide by policies within their programs of study, College, and the Graduate School policies. Students should refer to these websites often; policies, procedures, and forms may be updated throughout the academic year.

Academic Integrity

Graduate students in the College of Engineering and Applied Science may be required to pass an academic integrity quiz.

See also the campus-wide Academic Integrity (p. 15) and Student Conduct (p. 25) sections and the Honor Code (<http://honorcode.colorado.edu>) website.

Academic Standing

Refer to the Graduate School (p. 864) for details.

Credit and Enrollment

Attendance and Full-Time Enrollment

While the majority of our students attend classes on the Boulder campus, many of the College's graduate degrees and certificates are available online through Boulder Connect (<http://www.colorado.edu/connect>). Attendance and enrollment requirements are governed by Graduate School policies (<http://www.colorado.edu/graduateschool/policies>). However, the College's individual graduate programs may have requirements that are more stringent than the Graduate School.

Credit Policies

Final Grade Appeal

Visit the college's Grade Appeal Policy (<http://www.colorado.edu/engineering-facultystaff/college-rules-policies/grade-appeal-policy>) webpage.

Transfer Credit

Transfer credit requirements are governed by the Graduate School policies (<http://www.colorado.edu/graduateschool/policies>). However,

the College's individual graduate programs must approve the transfer credits and may have transfer credit requirements that are more stringent than the Graduate School. Refer to the individual graduate programs for specific transfer credit requirements.

Petition Policy

A student desiring a waiver of departmental and/or Graduate School policies must request and secure approval for this waiver through a petition procedure. Petitions are first presented to the student's individual graduate program for review, followed by review at the Graduate School.

Requirements

Prerequisites

To enroll for an advanced degree in any department or program in the College of Engineering and Applied Science, candidates either must have previously earned a bachelor's degree in a curriculum that includes the necessary prerequisites for that branch of engineering or must qualify for the concurrent BS and MS program. If the candidate's preliminary education was taken at some other institution, the degree of qualification for advanced work is determined by the department concerned and by the dean of the Graduate School.

Graduates of engineering technology programs should note that the equivalent of a BS degree in an appropriate engineering field is required for entry into the Graduate School. Because the goals and orientation of engineering programs differ from those of technology programs, technology graduates should expect to make up deficiencies before being admitted to graduate study in engineering. Students may not be admitted to the Graduate School while making up deficiencies, but can enroll as nondegree students.

Course Work

Graduate work in each department of the College of Engineering and Applied Science falls into two classes:

1. Courses that are offered for candidates who have chosen to major in the particular department
2. Courses that are offered for candidates who have chosen their major in some other department, but who are pursuing a certificate or other complementary course work

Availability of Courses

All courses are not necessarily offered every year. They may only be available if there is sufficient demand.

Qualifying or Preliminary Examinations

Graduate students who plan to become candidates for the MS or PhD degree may be required to take a qualifying or preliminary examination. Individual departments should be consulted concerning the timing or requirement of this examination.

Teaching and Research Assistantships

The College of Engineering and Applied Science requires that all graduate teaching assistants and research assistants be proficient and intelligible in spoken English. In order to ensure that this is the case, all prospective teaching assistants and research assistants whose native language is not English, or others for whom the department graduate program coordinator believes that spoken language intelligibility is a concern, regardless of native language, will be tested for spoken language intelligibility prior to or at the beginning of the semester in which the teaching or research assistantship is awarded. In the event that a

prospective teaching or research assistant does not demonstrate a satisfactory level of proficiency, as determined by campus assessment, that student will be required to participate in training designed to improve intelligibility.

Programs of Study

Aerospace Engineering Sciences

The Aerospace program is organized around focus areas in astrodynamics and satellite navigation systems; bioastronautics; remote sensing, Earth and space sciences; and aerospace engineering systems, including fluid dynamics and propulsion, automatic control, structures, and mechanics of materials.

The Department of Aerospace Engineering Sciences (<http://www.colorado.edu/aerospace>) at the University of Colorado Boulder is one of the top aerospace engineering departments in the nation. Aerospace engineers work on Earth and in space not only to extend frontiers, but also to understand more fully and to preserve our terrestrial environment. Few fields offer more exciting and diverse careers: becoming an astronaut (15 graduates to date have become astronauts), designing the next generation of aircraft and spacecraft, monitoring our global habitat via remote sensing from space, *in situ* sensing with unmanned vehicles, and helping to develop environmentally clean energy and transportation systems.

Aerospace graduate students often formulate degree plans on the basis of their interests and needs. Portions of the program are designed to promote the student's engineering and professional development.

Graduate students are admitted into a specific focus area that provides research advising and financial support, and sets specialized admission and program requirements and recommendations for course work within and outside the department. The four focus areas are:

- Aerospace Engineering Systems
- Astrodynamics and Satellite Navigation Systems
- Bioastronautics
- Remote Sensing, Earth and Space Sciences

Each focus area has defined the required characteristics of its successful graduates at the MS and PhD level, and defined the required and elective courses that support its educational program.

Aerospace-related research centers in the College include the Colorado Center for Astrodynamics Research, the Center for Aerospace Structures, the Research and Engineering Center for Unmanned Vehicles, and BioServe Space Technologies. Other research centers within the University that are involved in space-related research activities are the Center for the Study of Earth from Space, the Center for Astrophysics and Space Astronomy, the Laboratory for Atmospheric and Space Physics, JILA, and the Cooperative Institute for Research in Environmental Sciences.

Course code for this program is ASEN.

Master's Degrees

- Aerospace Engineering Sciences - Master of Science (MS) (p. 1193)
- Aerospace Engineering Sciences - Professional Master of Science (MSAES) (p. 1193)

Doctoral Degree

- Aerospace Engineering Sciences - Doctor of Philosophy (PhD) (p. 1194)

Certificates

- Astrodynamics and Satellite Navigation Systems - Graduate Certificate (p. 1194)
- Remote Sensing - Graduate Certificate (p. 1194)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aerospace Engineering Sciences

Ahmed, Nisar Razzi (https://experts.colorado.edu/display/fisid_153237)
Assistant Professor; PhD, Cornell University

Akos, Dennis M. (https://experts.colorado.edu/display/fisid_131119)
Associate Professor; PhD, Ohio University

Argrow, Brian M (https://experts.colorado.edu/display/fisid_102860)
Professor; PhD, University of Oklahoma Norman Campus

Axelrad, Penina (https://experts.colorado.edu/display/fisid_100792)
Professor; PhD, Stanford University

Biringen, Sedat (https://experts.colorado.edu/display/fisid_105974)
Professor; DSc, Universite Libre de Bruxelles (Belgium)

Brasseur, James Gordon (https://experts.colorado.edu/display/fisid_156801)
Research Professor; PhD, Stanford University

Cash, Webster C (https://experts.colorado.edu/display/fisid_101759)
Professor; PhD, University of California-Berkeley

Chu, Xinzhaoh (https://experts.colorado.edu/display/fisid_141893)
Professor; PhD, Peking Univ (China)

Clark, Torin K (https://experts.colorado.edu/display/fisid_155959)
Assistant Professor; PhD, Massachusetts Institute of Technology

Correll, Nicolaus J (https://experts.colorado.edu/display/fisid_147555)
Assistant Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Culp, Robert D.
Professor Emeritus

Doostan, Alireza (https://experts.colorado.edu/display/fisid_147382)
Associate Professor; PhD, Johns Hopkins University

Emery, William J (https://experts.colorado.edu/display/fisid_106038)
Professor; PhD, University of Hawaii at Manoa

Evans, John A (https://experts.colorado.edu/display/fisid_152970)
Assistant Professor; PhD, University of Texas at Austin

Farnsworth, John A (https://experts.colorado.edu/display/fisid_153255)
Assistant Professor; PhD, Rensselaer Polytechnic Institute

Felippa, Carlos A (https://experts.colorado.edu/display/fisid_105701)
Professor; PhD, University of California-Berkeley

Forbes, Jeffrey M (https://experts.colorado.edu/display/fisid_100264)
Professor; PhD, Harvard University

Frew, Eric W (https://experts.colorado.edu/display/fisid_134685)
Associate Professor; PhD, Stanford University

Gerren, Donna Sue (https://experts.colorado.edu/display/fisid_108563)
Senior Instructor

Hamlington, Peter Edward (https://experts.colorado.edu/display/fisid_149800)
Assistant Professor; PhD, University of Michigan Ann Arbor

Humbert, James Sean (https://experts.colorado.edu/display/fisid_156202)
Associate Professor; PhD, California Institute of Technology

Hussein, Mahmoud Ismail (https://experts.colorado.edu/display/fisid_144300)
Associate Professor; PhD, University of Michigan Ann Arbor

Jansen, Kenneth E (https://experts.colorado.edu/display/fisid_147360)
Professor; PhD, Stanford University

Jones, Brandon A (https://experts.colorado.edu/display/fisid_149418)
Asst Professor Adjunct

Kantha, Lakshmi H (https://experts.colorado.edu/display/fisid_100231)
Professor; PhD, Massachusetts Institute of Technology

Klaus, David M (https://experts.colorado.edu/display/fisid_107103)
Professor; PhD, University of Colorado Boulder

Knipp, Delores Jane (https://experts.colorado.edu/display/fisid_147655)
Research Professor; PhD, University of California-Los Angeles

Koster, Jean N.
Professor Emeritus

Larson, Kristine M (https://experts.colorado.edu/display/fisid_105437)
Professor; PhD, University of California-San Diego

Lawrence, Dale A (https://experts.colorado.edu/display/fisid_104057)
Professor; PhD, Cornell University

Leben, Robert R (https://experts.colorado.edu/display/fisid_105118)
Research Professor; PhD, University of Colorado Boulder

Li, Xinlin (https://experts.colorado.edu/display/fisid_100016)
Professor; PhD, Dartmouth College

Marden, Jason R. (https://experts.colorado.edu/display/fisid_147582)
Associate Professor; PhD, University of California-Los Angeles

Marshall, Robert Andrew (https://experts.colorado.edu/display/fisid_155957)
Assistant Professor; PhD, Stanford University

Maslanik, James
Professor Emeritus

Matsuo, Tomoko (https://experts.colorado.edu/display/fisid_145041)
Assistant Professor; PhD, SUNY at Stony Brook

Maute, Kurt Karl (https://experts.colorado.edu/display/fisid_113875)
Professor; PhD, Univ of Stuttgart (Germany)

McGrath, Michael T (https://experts.colorado.edu/display/fisid_100133)
Professor Adjunct

McMahon, Jay W (https://experts.colorado.edu/display/fisid_150062)
Assistant Professor; PhD, University of Colorado Boulder

Nabity, James A. (https://experts.colorado.edu/display/fisid_153102)
Associate Professor; PhD, University of Colorado Boulder

Neogi, Sanghamitra (https://experts.colorado.edu/display/fisid_156773)
Assistant Professor; PhD, Pennsylvania State University

Nerem, Robert Steven (https://experts.colorado.edu/display/fisid_118478)
Professor; PhD, University of Texas at Austin

Palo, Scott E (https://experts.colorado.edu/display/fisid_109033)
Professor; PhD, University of Colorado Boulder

Pao, Lucy Y (https://experts.colorado.edu/display/fisid_107151)
Professor; PhD, Stanford University

Park, Kwang-Chun
Professor Emeritus

Schaub, Hanspeter (https://experts.colorado.edu/display/fisid_143818)
Professor; PhD, Texas AM University

Scheeres, Daniel J. (https://experts.colorado.edu/display/fisid_145035)
Distinguished Professor; PhD, University of Michigan Ann Arbor

Schwartz, Trudy L (https://experts.colorado.edu/display/fisid_108607)
Senior Instructor; MS, University of Colorado Boulder

Snyder, Howard
Professor Emeritus

Sternovsky, Zoltan (https://experts.colorado.edu/display/fisid_115211)
Associate Professor; PhD, Charles Univ, Prague (Czech Republic)

Stodieck, Louis S (https://experts.colorado.edu/display/fisid_105272)
Research Professor; PhD, University of Colorado Boulder

Thayer, Jeffrey P (https://experts.colorado.edu/display/fisid_134469)
Professor; PhD, University of Michigan Ann Arbor

Voss, James S (https://experts.colorado.edu/display/fisid_140891)
Scholar In Residence; MS, University of Colorado Boulder

BioServe Space Technologies

Hoehn, Alexander (https://experts.colorado.edu/display/fisid_104942)
Assoc Professor Adjunct

Klaus, David M (https://experts.colorado.edu/display/fisid_107103)
Associate Professor; PhD, University of Colorado Boulder

Stodieck, Louis S (https://experts.colorado.edu/display/fisid_105272)
Research Professor; PhD, University of Colorado Boulder

Courses

ASEN 5007 (3) Introduction to Finite Elements

Introduces finite element methods used for solving linear problems in structural and continuum mechanics. Covers modeling, mathematical formulation, and computer implementation.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite matrix algebra.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5010 (3) Spacecraft Attitude Dynamics and Control

Includes rigid body kinematics and spacecraft attitude descriptions, torque-free attitude dynamics, static attitude determination, motion and stability due to gravity gradient torque and spinning craft, passive and active methods of attitude control, nonlinear regulator and attitude tracking feedback control laws.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 5012 (3) Mechanics of Aerospace Structures

Applies fundamental concepts of continuum mechanics, theory of elasticity and energy methods to the analysis of structures.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5023

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites APPM 2360 and ASEN 2001 and ASEN 2003 and ASEN 3112 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5014 (3) Linear Control Systems

Introduces the theory of linear systems, including vector spaces, linear equations, structure of linear operators, state space descriptions of dynamic systems, and state feedback control methods.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Systems and Control

ASEN 5016 (3) Space Life Sciences

Familiarizes students with factors affecting living organisms in the reduced-gravity environment of space flight. Covers basic life support requirements, human physiological adaptations, and cellular-level gravity dependent processes with emphasis on technical writing and research proposal preparation.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5018 (3) Graduate Projects I

Exposes MS and PhD students to project management and systems engineering disciplines while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this first semester of the two-semester course sequence: requirements, definition, design and design review, build, test, and verification.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5158 or instructor consent required.

ASEN 5022 (3) Dynamics of Aerospace Structures

Applies concepts covered in undergraduate dynamics, structures and mathematics to the dynamics of aerospace structural components, including methods of dynamic analysis, vibrational characteristics, vibration measurements and dynamic stability.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5012 or ASEN 5227 or MATH 2130 or APPM 3310 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5034 (3) Stochastic Methods for Systems Engineering

Development of stochastic models used in aerospace and other systems engineering and optimization problems. Review of probability theory, stochastic models used in decision theory, random processes, queuing theory, information theory, reliability and quality control. Computer solutions required.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5037 (3) Turbulent Flows

Studies turbulent closure methods and computational procedures used to solve practical turbulent flows. Emphasizes multi-equation models used with time-averaged equations to calculate free-turbulent shear-flows and turbulent boundary layers. Employs spectral methods in direct and large-eddy simulation of turbulence. Formerly ASEN 6037.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5051 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5044 (3) Statistical Estimation for Dynamical Systems

Introduces theory and methods of statistical estimation for general linear and nonlinear dynamical systems, with emphasis on aerospace engineering applications. Major topics include: review of applied probability and statistics; optimal parameter and dynamic state estimation; theory and design of Kalman filters for linear systems; extended/unscented Kalman filters and general Bayesian filters for nonlinear systems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 5047 (3) Probability and Statistics for Aerospace Engineering Sciences

Considers probability concepts and theory for better design and control of aerospace engineering systems. Includes descriptive and inferential statistical methods for experimental analysis. Covers discrete and continuous random variable distributions, estimators, confidence intervals, regression, analysis of variance, hypothesis testing, nonparametric statistics, random processes and quality control, including software models of same.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5050 (3) Space Flight Dynamics

Includes celestial mechanics, space navigation, and orbit determination; trajectory design and mission analysis trajectory requirements; and orbital transfer and rendezvous.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 5051 (3) Fluid Mechanics

Highlights physical properties of gases and liquids; kinematics of flow fields; and equations describing viscous, heat-conducting Newtonian fluids. Emphasizes exact solutions and rational approximations for low and high speed dissipative flows, surface and internal waves, acoustics, stability, and potential flows.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5053 (3) Rocket Propulsion

An in depth presentation of the theory, analysis, and design of rocket propulsion systems. Liquid and solid propellant systems are emphasized with an introduction to advanced propulsion concepts. Nozzle and fluid flow relationships are reviewed for background.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 5063 (3) Aircraft Propulsion

Designed to teach the theory, analysis and design of engines used for aircraft propulsion. Will deal with engine selection, engine performance, analysis and design of various components of modern aircraft engines, with emphasis on recent developments such as the geared turbofan.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4013 or equivalent or instructor consent required.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 5090 (3) Introduction to Global Navigation Satellite Systems

Global Navigation Satellite Systems (GNSS) are important tools for navigation, science, and engineering. Introduces GNSS hardware, signal structure, algorithms, error sources, and modeling techniques. Programming experience is required.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 5098 (3) System Engr and Design

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5111 (3) Introduction to Aeroelasticity

Introduces static and dynamic aeroelasticity of airfoils and wings. Covers the classical aeroelasticity theory and introduces computational methods for aeroelastic problems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 3111 or MATH 2130 or APPM 3310 and MATH 3430 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5114 (3) Automatic Control Systems

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4114

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 3128 and ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Systems and Control

ASEN 5122 (3) Control of Aerospace Structures 1

Introduces the basic problems in dynamic modeling and active control of large spacecraft and satellites. Includes system descriptions, model reduction, controller design, and closed-loop stability analysis.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5148 (3) Spacecraft Design

Integrates the design elements and fundamental analyses necessary to complete the conceptual (Phase A) design of an unmanned spacecraft. Lecture and discussion explore mission design, propulsion, power, structure, thermal, attitude control, communication, command, and data handling and attitude control systems. The role of project management and systems engineering are examined. Resource estimating and lessons learned in satellite programs are reviewed.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5151 (3) High Speed Aerodynamics

Provides aerodynamic theory applicable to the high speed flight of subsonic, transonic, and supersonic aircraft, and hypersonic vehicles. Topics include linear theory of subsonic and supersonic speeds, the nonlinear theories of transonic and hypersonic speeds, and compressible boundary layers.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5158 (3) Space Habitat Design

Utilizes systems engineering methods for designing a spacecraft intended for human occupancy and provides a working knowledge of the technologies used to sustain life. Emphasis is placed on deriving functional requirements from stated mission objectives, developing integrated vehicle schematics, and comparing design options by trade study.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5168 (3) Remote Sensing Instrumentation Design

Reviews and makes a detailed analysis of satellite instrumentation techniques and systems to understand the components, limitations, and overall capabilities. Emphasis on optical systems with in-depth treatment of conventional radiometry. Introduces both passive and microwave methods.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5188 (3) Fundamentals of Systems Engineering

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

Equivalent - Duplicate Degree Credit Not Granted: EMEN 5405

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5210 (1) Remote Sensing Seminar

Covers subjects pertinent to remote sensing of the Earth, including oceanography, meteorology, vegetation monitoring, and geology. Emphasizes techniques for extracting geophysical information from satellite data. Course requirement for Remote Sensing Certificate. Formerly ASEN 6210.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 5212 (3) Composite Structures and Materials

Develops the macromechanical and micromechanical theory of the elastic behavior and failure of composite laminates. Applies basic theory to a broad range of practical problems including the buckling and vibration of composite plates, columns, and shells.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4215 and ATOC 4215 and ATOC 5215

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5216 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4216 and ECEN 4811 and ECEN 5811

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5218 (3) Large Space Structures Design

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4218

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5222 (3) Materials Science for Composite Manufacturing

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4222

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 3112 and ASEN 4012 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5227 (3) Mathematics for Aerospace Engineering Sciences 1

Provides an introduction to the methods and mathematics of advanced engineering analysis tailored to aerospace engineering applications. Topics include vector and tensor calculus, ordinary differential equations, and an introduction to the calculus of variations.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5235

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite one year of calculus-based physics and math up through differential equations.

Additional Information: Departmental Category: Remote Sensing

ASEN 5245 (3) Radar and Remote Sensing

Examines active techniques of remote sensing, with emphasis on radar fundamentals, radar wave propagation, scattering processes, and radar measurement techniques and design. Examines specific radar systems and applications, such as synthetic aperture radar phased arrays for atmosphere, space, land, and sea applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 5255 (3) Environmental Aerodynamics

A review of the properties and causes of hazards posed by the environment, ranging from atmospheric wind shear to tornadic flows. Involves a multidisciplinary approach combining analytical, numerical, scale modeling studies with extensive field measurements, wind energy and biophysical aerodynamics.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4255

Recommended: Prerequisite senior standing in aerospace engineering.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5307 (3) Engineering Data Analysis Methods

Gives students broad exposure to a variety of traditional and modern statistical methods for filtering and analyzing data. Topics include estimation methods, principal component analyses and spectral analyses. Introduces these methods and provides practical experience with their use. Students carry out problem assignments.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5315 (3) Ocean Modeling

Introduces students to basic principles behind, and the current practices in, ocean modeling. Discusses different prevailing approaches. Offers students hands-on experience with the use of supercomputers and work stations for model running and pre- and post-processing.

Recommended: Prerequisite graduate standing or instructor consent required.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5321 (3) Computational Fluid Dynamics Structured Grid

Introduction to advanced computational methods for the solution of fluid mechanics problems on the computer with emphasis on nonlinear flow phenomena. Formerly ASEN 6327.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5417 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5325 (3) Small Scale Processes in Geophysical Fluids

Provides an overview of mixing and wave processes in the oceans and the atmosphere. Topics include turbulent boundary layers in the lower atmosphere and the upper ocean, air-sea interactions, and surface and internal waves.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5331 (3) Computational Fluid Dynamics Unstructured Grid

Focuses on unstructured grid computational approaches to solve the Navier-Stokes equations. Assumes a basic knowledge of the solution of partial differential equations with numerical methods with focus finite element/volume methods (FEM/FVM but primarily FEM). These issues include: the discrete formulation, non-linear equation iterator, linear equation formation, boundary condition prescription and linear equation solution.

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5335 (3) Aerospace Environment

Examines the components of the solar-terrestrial system and their interactions to provide an understanding of the re-entry and orbital environments within which aerospace vehicles operate. Includes the sun, solar wind, magnetosphere, ionosphere, thermosphere, radiation belts, energetic particles, comparative environments (Mars, Venus, etc.), orbital debris, spacecraft charging, particle effects on systems, shielding, and satellite drag.

Recommended: Prerequisite senior or graduate standing in engineering or related physical sciences.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5347 (3) Math Methods in Dynamics

Two-part graduate-level course on dynamics. Covers both flexible and rigid multibody analytical dynamics and finite element method for dynamics. Emphasizes formulations that naturally lead to easy computer implementation and stability, linearization, and modern rotational kinematics. Department consent required.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5417 (3) Numerical Methods in Engineering and Science

Provides computational skills and basic knowledge of numerical methods for advanced courses in engineering/scientific computation using Fortran, C, or Matlab.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite APPM 2360 or equivalent or instructor consent required.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5426 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4426 and ECEN 4821 and ECEN 5821

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5436 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4831 and ECEN 5831

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5440 (3) Mission Design and Development for Space Sciences

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5780

Grading Basis: Letter Grade

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5506 (1-2) Bioastronautics Seminar

Focuses on current topics related to space habitat systems design and research aimed at understanding the effects of spaceflight on living organisms ranging from humans down to microbes. Literature analysis and scientific presentations are expected. Emphasis is on biophysical mechanisms, comprehensive models, and related technology development.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5519 (1-3) Selected Topics

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Class Search.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite varies.

Additional Information: Departmental Category: Specialized Courses

ASEN 5849 (1-6) Independent Study

Study of special projects.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Specialized Courses

ASEN 5940 (3-6) Engineering Research Internship

Grants credit to foreign visiting graduate students for conducting research within the Aerospace Engineering Sciences department. Credits can be transferred to the student's home institution. CU-Boulder students may also receive credit for conducting research outside of the university, either overseas or in the US.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Specialized Courses

ASEN 6001 (3) Reacting Flows

Provides an introduction to reacting flows and combustion. Covers chemical kinetics, including global and detailed mechanisms and the variable density flow equations are derived. Relevant non-dimensional parameters and limiting behaviors are discussed. The Rankine-Hugoniot relations are presented and various aspects of diffusion, kinetically dominated and balanced combustion are outlined. Flame structures are discussed, including laminar and turbulent flames, and the Burke-Schumann solution is outlined. The turbulent forms of the motion equations are derived and the reactive scalar transport equation and mixture fraction variable are presented. The flamelet progress variable approach is outlined, including a comparison of steady and unsteady flamelet models. Specific topics in spray combustion, triple flames, solid-gas reactors and detonations are discussed.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 6001

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6008 (3) Interplanetary Mission Design

Exploration of principles and methods related to the design and construction of trajectories for interplanetary mission design. Some topics covered include: two-and three-body motion, gravity assists, maneuver computation, navigation, numerical integration, and construction of orbits. The main focus is on simple ballistic mission designs, such as Galileo or Cassini, however, libration point trajectories will also be covered.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5050 or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6009 (1-2) Special Topics Seminar

Presents research and developments in each department's focus areas.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Specialized Courses

ASEN 6010 (3) Advanced Spacecraft Dynamics and Control

Studies the dynamic modeling and control of spacecraft containing multiple momentum exchange devices, and/or flexible spacecraft components. Will develop nonlinear feedback control algorithms, explore singularity avoidance strategies. The second half of the course derives analytical methods (D'Alembert's equations, Lagrange's equations, Boltzmann-Hamel equations) to model a hybrid rigid/flexible spacecraft system.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6013 (3) High Speed Propulsion

Covers air-breathing and rocket propulsion cycles, their relative performance trade-offs, and how they fit within the context of a vehicle system. Specific emphasis will be placed on fundamental cycle analyses, component level design, and propulsion/airframe integration for rockets, turbojets, ramjets, scramjets, combined cycles, and other advanced propulsion concepts.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4013 or equivalent or instructor consent required.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 6014 (3) Spacecraft Formation Flying

Studies the dynamic modeling and control of spacecraft formations orbiting about a planet. Investigate linear and nonlinear relative motion descriptions, rectilinear and curvilinear coordinates, orbit element difference based descriptions, J2-invariant relative orbits, as well as Lyapunov-based relative motion control strategies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5050 or instructor consent required.

Additional Information: Departmental Category: Systems and Control

ASEN 6020 (3) Optimal Trajectories

Introduces the theory and practice of trajectory optimization. The general theory behind optimization and optimal control will be introduced with an emphasis on the properties of optimal trajectories. The main application will be to space trajectories, but other applications will also be considered.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 5050 and ASEN 5014 or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6021 (3) Viscous Flow

Studies low Reynolds number flows, including incompressible and compressible laminar boundary layer theory; similarity theory; and separation, transition, and turbulent boundary layers.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5051 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6024 (3) Nonlinear Control Systems

Introduces the analysis and control design methods for nonlinear systems, including Lyapunov and Describing Function methods.

Requisites: Requires prerequisite course of ASEN 5014 (minimum grade C). Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 6028 (3) Graduate Projects II

Exposes MS and PhD students to leadership positions in project management and systems engineering while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this second semester of the two-semester course sequence: requirements definition, design and design review, build, test, and verification.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5018 or ASEN 5158 or instructor consent required.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 6050 (3) Space Instrumentation

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6050 and GEOL 6050

Requisites: Requires prerequisite course of ASEN 5335 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 6060 (3) Advanced Astrodynamics

Covers Lagrangian and Hamiltonian formalisms for astrodynamics problems, the computation and characterization of space trajectories in highly dynamic environments, computation of periodic orbits, stability analysis of orbital motion, and development of analytical theories for dynamics.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5050 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6061 (3) Molecular Gas Dynamics and DSMC

Describes the composition and flow of gases on a microscopic level to examine the behavior of the molecules that make up a macroscopic flow system. Thermodynamic properties, transport phenomena, and the governing Boltzmann Equation are derived from molecular collision dynamics and the kinetic theory. The Direct Simulation Monte Carlo method is introduced with applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6070 (3) Satellite Geodesy

Focuses on the measurement of the Earth's gravitational field, rotational characteristics, and shape using Earth and space-based tracking of artificial satellites. Particular emphasis on satellite altimetry and satellite gravity measurements.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6080 (3) Statistical Orbit Determination

Course on orbit and advanced estimation techniques. Emphasizes orthogonal transformation techniques such as Givens and Householder, square root filtering and smoothing and considers covariance analysis. Also nonlinear filters and dynamic model compensation techniques. Requires term project that involves the application of many of the techniques required for precise orbit determination.

Requisites: Requires prerequisite course of ASEN 5044 (minimum grade D-). Restricted to Aerospace Engineering (ASEN) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6090 (3) Advanced Global Navigation Satellite Systems: Software and Applications

Focuses on high-precision applications of Global Navigation Satellite Systems (GNSS) and the software tools that are needed to achieve these precisions. Topics include precise orbital determination, reference frames, atmospheric delays, relativity, clock models, ambiguity resolution, and scientific applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5090 or instructor consent required.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 6091 (3) Global Navigation Satellite System (GNSS) Receiver Architecture

Investigates the overall architecture of satellite navigation receivers: including both the analog radio frequency conditioning (antenna to the analog-to-digital converter) and the various signal processing algorithms. Such treatment of the operation of the receiver will provide insight into the trade-offs that go into GNSS as well as the more broad generic spread spectrum receiver design.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5090.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 6107 (3) Nonlinear Finite Element Methods

Continuation of ASEN 5007. Covers the formulation and numerical solution of nonlinear static structural problems by finite element methods. Emphasizes the treatment of geometric nonlinearities and structural stability.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5007 or equivalent or instructor consent required.

Additional Information: Departmental Category: Specialized Courses

ASEN 6116 (3) Spacecraft Life Support Systems

Study the environmental control and the life support systems and technologies that keep people alive and healthy in spacecraft and habitats. Students will learn about thermal control systems, air revitalization processes, water reclamation and treatment, waste handling and the reuse of materials, and food and nutrition. Expect to develop analytical models from first principles and perform hands-on laboratory experiments. Formerly ASEN 5116.

Requisites: Requires prerequisite course of ASEN 5158 (minimum grade D-). Requires corequisite course of ASEN 5016. Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 6220 (3) Topics in Remote Sensing

Covers infrared and microwave techniques for remote sensing, emphasizing oceanographic applications, fundamentals of electromagnetic radiation, remote sensing instrumentation (radars and radiometers), and conversion of sensory data to geophysical parameters, including sea surface topography, temperature, and atmospheric moisture.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 6265 (3) Fundamentals of Spectroscopy for Optical Remote Sensing

Provides a comprehensive overview of the fundamentals of quantum physics, atomic spectroscopy, molecular spectroscopy and laser spectroscopy. Exposes students to the spectroscopy applications in modern optical and laser remote sensing. Assists students to develop the fundamental knowledge and skills for independent learning.

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

ASEN 6337 (3) Remote Sensing Data Analysis

Reviews satellite remote sensing instrumentation and methods. Student teamwork involves real satellite data for applications in oceanography, atmospheric science, and terrestrial physics. Students develop problem-solving skills and use the internet to gather satellite and in situ data to address chosen problems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 6365 (3) Lidar Remote Sensing

Provides a comprehensive, yet easily understandable, up-to-date understanding of lidar principles, technologies and applications. Contains approaches for quantitative lidar simulation, lidar sensitivity and error analysis, lidar data retrieval, lidar system design and performance analysis. Gives students opportunities to see and operate real state-of-the-art lidar systems and make connections to lidar experts in the nation and world.

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 6367 (3) Advanced Finite Element Methods for Plates, Shells, and Solids

Continues ASEN 5007. Covers more advanced FEM applications to linear static problems in structural and continuum mechanics. Focuses on modeling, formulation and numerical solutions of problems modeled as plates, shells and solids. Includes an overview of advanced variational formulations.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite introductory graduate level course in FEM and familiarity with linear algebra.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 6412 (3) Uncertainty Quantification

This advanced topics course provides an exploration of techniques for representation and propagation of uncertainty in PDE/ODE-based systems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites APPM 5570 and ECEN 5612 (all minimum grade B) or equivalent courses with instructor consent.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 6427 (3) Advanced Computational Fluid Dynamics

Introduces computational techniques particularly applicable to high-speed gas flows that contain shocks. Complicated numerical methods are developed from relatively simple numerical modules.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5417 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6517 (3) Computational Methods In Dynamics

Covers modeling, computational algorithms and their computer implementation for both linear and nonlinear dynamical systems. Topics covered include transient analysis, wave propagation, multiphysics analysis, and their significant engineering applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5022 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 6519 (1-3) Special Topics

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite varies.

Additional Information: Departmental Category: Specialized Courses

ASEN 6800 (3) Master of Eng Project

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Specialized Courses

ASEN 6849 (1-6) Independent Study

Studies special projects agreed upon by student and instructor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 6949 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Specialized Courses

ASEN 6950 (1-6) Master's Thesis

Additional Information: Departmental Category: Specialized Courses

ASEN 8990 (1-10) Doctoral Thesis

Additional Information: Departmental Category: Specialized Courses

Aerospace Engineering Sciences - Master of Science (MS)

Ranked among the top four schools in the country by the National Research Council, CU Boulder's Department of Aerospace Engineering Sciences (AES) is internationally recognized for its research and education leadership in aerospace engineering, Earth and space sciences. Its world-renowned engineers and scientists tackle challenges in aerospace technology and science, focusing on astrodynamics and satellite navigation, remote sensing, Earth and space sciences, vehicle systems, structures and materials, and bioastronautics.

With more than 40 faculty members and nearly 300 MS and PhD students, our graduate programs prepare aerospace engineering students to meet the needs of our 21st-century society through the understanding, conception, design and application of aerial and spacecraft systems.

In the MS program, we focus on hands-on, experiential learning, technical and organizational expertise, and end-to-end mission and systems perspectives.

For more information, visit the department's Graduates (<http://www.colorado.edu/aerospace/prospective-students/graduates>) webpage.

Dual Degree Program

Dual MS/ME in Aerospace Engineering Sciences and Engineering Management

For more information, visit the Engineering Management Program's MS Aerospace Engineering Sciences & ME Engineering Management (<http://www.colorado.edu/emp/programs/graduate-program/dual-degree-program/ms-aerospace-engineering-sciences-me-engineering>) webpage.

Requirements

Course Requirements

- Students must complete a total of 30 credit hours (including both course and thesis hours) with a grade of B- or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000 level or above, and at least 18 of those credits must be in ASEN courses.
- Two to four required courses (6–12 credit hours) must be taken in the student's primary focus or thrust area and one course (3 credit hours) must be taken in a second focus or thrust area. Students must also complete one graduate-level math course (3 credit hours) in ASEN, APPM or MATH.
- Up to 6 credit hours of 4000-level relevant courses from approved departments outside aerospace may be accepted for master's degree credit if they fit with the student's degree plan.

Plan I

Students must complete 6 credit hours of MS thesis. The Plan I project culminates with an oral presentation and/or written report or oral examination.

Plan II

Students must complete 6 credit hours toward their approved certificate program or a two-semester team projects course.

Time Limit

All degree requirements must be completed within four years of the date of commencing course work. Most students complete the degree in one to two years.

Aerospace Engineering Sciences - Professional Master of Science (MSAES)

A professional master's degree (MSAES) in aerospace engineering sciences from CU Boulder is designed for working engineers and people planning to pursue a career in industry. We designed the program with industry partners to meet your needs, further your career and with your location in mind—the degree can be earned on campus or 100 percent online.

For more information, visit the department's Graduates (<http://www.colorado.edu/aerospace/prospective-students/graduates>) webpage.

Requirements

Course Requirements

- The professional master's degree requires a total of 30 credit hours.
- At least 24 credit hours must be completed at the 5000 level or above.
- At least 18 credit hours must be in ASEN courses, with the completion of one approved math course.

Time Limit

All degree requirements must be completed within four years of the date of commencing course work.

Aerospace Engineering Sciences - Doctor of Philosophy (PhD)

Students typically complete their PhD in aerospace engineering sciences within 4 to 6 years, depending on whether they enter the program with a master's degree. It is possible for highly qualified students to enter the PhD program without a master's degree.

The primary focus of a PhD student is to perform novel research and support their faculty advisor. At the time of admission, PhD students must have a faculty advisor who agrees to accept the student into their research program and mentor their academic progress. PhD students are supported through research and teaching assistantships and are also encouraged to apply for their own source of funding.

For more information, visit the department's Prospective Graduate Students (<http://www.colorado.edu/aerospace/prospective-students/graduates>) webpage.

Requirements

Course Requirements

- A minimum of 36 credit hours of courses numbered 5000 or above (at least 18 of these must be in ASEN) with a minimum of 3.25 GPA.
- 30 credit hours of dissertation credit are required for the degree.
- A maximum of 18 credit hours may be transferred from another accredited institution and applied toward a PhD degree if approved by the graduate committee of the department and the Graduate School.
- All courses taken for the master's degree at the 5000 level or above at the University of Colorado may be applied toward the doctoral degree at the university.
- The formal course work must include a minimum of 18 credit hours of courses or their equivalent in aerospace engineering sciences.

Preliminary Examination

Students must pass a preliminary examination by no later than the end of the third semester if the student already has an aerospace master's degree upon entry to the program, or the fifth semester if the student does not have an aerospace master's degree. The exam is administered by a committee consisting of three regular or research aerospace faculty members, two of whom must be from the student's main focus or thrust area and the third from a secondary focus or thrust area. The exam will

include a written and an oral element, as determined, prepared, and evaluated by the exam committee.

Comprehensive Examination

By no later than the fifth semester, or seventh semester, students must also pass an oral examination before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School. This should be preceded by individual examinations or interviews, either written or oral or both, by every committee member. The oral examination before the committee is based primarily on a written proposal for the thesis research provided by the student to committee members in advance.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Astrodynamics and Satellite Navigation Systems - Graduate Certificate

The Astrodynamics and Satellite Navigation Systems Certificate (<http://www.colorado.edu/aerospace/current-students/graduates/curriculum/aerodynamics-satellite-navigation-systems/asn-certificate>) recognizes student accomplishments at the graduate level in successfully completing a specialized program of study in astrodynamics and satellite navigation (ASN). It is essentially a specialization of the aerospace engineering sciences Master of Science (MS) degree in the ASN focus area with additional requirements for breadth and depth in the ASN area.

The certificate will make students more desirable to future employers looking for astrodynamics and satellite navigation specialists.

Distance Education

Students can complete the requirements for this graduate certificate via distance education (online) through Boulder Connect (<http://www.colorado.edu/connect/certificate-programs>).

Requirements

The Astrodynamics and Satellite Navigation (ASN) Certificate (<http://www.colorado.edu/aerospace/current-students/graduates/curriculum/aerodynamics-satellite-navigation-systems/asn-certificate>) requires completion of all four core area subjects in the ASN focus area, plus two advanced ASN courses of the student's choosing.

Remote Sensing - Graduate Certificate

Remote sensing (satellite and ground-based) is increasingly being used as a technique to probe the Earth's atmosphere, ocean, and land surfaces. Probing of other planets is accomplished largely by satellite

remote sensing. Given national priorities in such areas as climate and global change, the interest in remote sensing will only increase with time.

Remote sensing is a relatively new academic subject, with few universities having any sort of an organized curriculum. The purpose of formalizing the CU remote sensing curriculum is to coordinate curricula across campus so that a coherent curriculum in remote sensing can be provided to complement and supplement the students' regular degree program. An additional purpose is to encourage multi-disciplinary education of the students in the area of remote sensing.

Graduate students, research staff, and faculty work on a wide variety of topics, ranging from the theory of remote sensing, to its application. These applications include: use of satellite remote sensing to determine ocean surface temperature and heat fluxes; use of surface radar to improve the determination of clouds and precipitation from satellite; determination of surface biological characteristics and productivity from satellite; mapping of land use from satellite; mapping of surface landform and topographical features; searching for locations of buried artifacts; use of surface radar to determine upper atmosphere wind motions; and aircraft remote sensing to assess the validity of satellite retrieval algorithms of surface and atmospheric characteristics.

Distance Education

Students can complete the requirements for the Remote Sensing Certificate (<http://www.colorado.edu/aerospace/current-students/graduates/curriculum/remote-sensing-earth-space-science/remote-sensing-certificate>) certificate via distance education (online) through Boulder Connect (<http://www.colorado.edu/connect/certificate-programs>).

The Remote Sensing Certificate (<http://www.colorado.edu/aerospace/current-students/graduates/curriculum/remote-sensing-earth-space-science/remote-sensing-certificate>) will be awarded based on a written request by the student to the Remote Sensing Graduate Chair, provided that the following requirements have been met:

1. Four courses are required totaling at least 12 credits, with grades of B or better.
2. Two courses from one of the following topical areas:
 - a. Data Analysis
 - b. Instrumentation and Measurement Techniques
 - c. Remote Sensing Theory
3. One course in each of the two remaining topical areas.
4. At least one semester of Remote Sensing Seminar (currently listed as ASEN 5210 and ATOC 7500).

Architectural Engineering

Architectural engineering focuses on the design, construction, and operation of buildings and the integration of their systems. The department offers Master of Science (MS) and Doctor of Philosophy (PhD) degrees in architectural engineering with a study emphasis in (1) building energy, (2) illumination, (3) materials and resources, and (4) construction engineering and management.

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental, and Architectural Engineering (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>). The Graduate Record Examination (GRE), consisting of the aptitude tests and advanced test in engineering, is used to evaluate MS and

PhD candidates. Candidates who submit GRE scores are more likely considered for financial assistance.

Course code for this program is AREN.

Research Interests and Facilities

The Department has a wide variety of research facilities, including a 15g-ton centrifuge for geotechnical and structural model studies and a large 440g-ton geotechnical centrifuge for use in model testing. Also available is an instructional computing facility, the Bechtel Laboratory and the M.Y. Leung Computational Laboratory for Soils and Structures, both equipped with Windows and Linux high-performance workstations. In addition, extensive structural engineering, engineering mechanics and geotechnical capabilities exist such as a one-million-pound universal testing machine and several cubical cells for multi-axial testing of materials. A 40 ft. by 80 ft. structural strong floor with associated equipment permits the testing of a wide variety of structural configurations under controlled, both static and dynamic loading. The hydraulics and water resources research laboratories include excellent facilities in water quality and environmental engineering. A unique workstation laboratory for advanced decision support systems is available. Programs in construction management and building energy are well supported. The 3600 sq. ft. mechanical and energy laboratory is capable of testing full-scale, commercial building systems and their controls using a one-of-a-kind data acquisition and experimental control system. The laboratory has been recently redesigned and renovated for maximum flexibility to encourage a wide variety of research and testing procedures.

The Environmental Engineering program maintains approximately 12,000 sq. ft. of laboratories in the areas of process research, environmental microbiology, environmental chemistry, water quality, air quality, molecular biology, toxicology, and field ecology. The Environmental Sustainability cluster and the Center for Environmental Mass Spectrometry offer formal collaborations between the CU Boulder Environmental Engineering Group, the Mechanical Engineering air research group, the US Geological Survey, and industry partners, providing state-of-the-art facilities for research and teaching.

The Center for Advanced Decision Support for Water and Environmental Systems (CADSWES) is an interdisciplinary center of excellence, housed within the Department of Civil, Environmental and Architectural Engineering. CADSWES focuses on applying advanced computing techniques to provide decision makers with decision support systems (DSSs) to help them more effectively manage water and environmental systems.

Current research covers such topics as water and wastewater treatment, surface and subsurface contaminant transport, decision support systems, hydraulic research, land treatment, rapid infiltration, and activated sludge processes. Cost prediction in construction, construction management, energy conservation in buildings, solar applications, and lighting systems are included. Advances in soil mechanics, rock mechanics, soil dynamics and geotechnical earthquake engineering, foundation engineering, computational geomechanics, centrifugal modeling, geosynthetics, and glacier flows have been produced. Research in structures includes stability, damage and fracture, material microstructures, durability, finite element modeling, reinforced concrete, earthquake responses, reinforced masonry structures, prestressed concrete, and dynamic control.

Master's Degrees

- Architectural Engineering - Master of Science (MS) (p. 1197)

Doctoral Degree

- Architectural Engineering - Doctor of Philosophy (PhD) (p. 1197)

Courses

AREN 5010 (3) HVAC System Modeling and Control

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4010

Recommended: Prerequisite AREN 4140.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5020 (3) Building Energy Audits

Analyzes and measures performance of HVAC systems, envelopes, lighting and hot water systems, and modifications to reduce energy use. Emphasizes existing buildings.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5050 (3) Advanced Solar Design

Predicts performance and analyzes economics of low-temperature, high-temperature, photovoltaic, and other innovative solar systems. Also includes performance prediction methods for solar processes.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 2120.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5070 (3) Thermal Analysis of Buildings

Examines response factors, conduction transfer functions and weighting factors for dynamic analysis of building envelopes. Also studies radiative and convective exchange in buildings, internal gains and infiltration analysis as modeled in hourly simulations.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5080 (3) Computer Simulation of Building Energy Systems

Introduces major simulation programs for analysis of building energy loads and system performance. Focuses on one hourly simulation program to develop capability for analysis of multizone structure.

Requisites: Requires prerequisite course of AREN 4110 or AREN 5110 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5110 (3) HVAC Design

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4110

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5130 (3) Optical Design for Illumination and Solid State Lighting

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4130

Recommended: Prerequisite AREN 3540.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5540 (3) Exterior Lighting Systems

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4540

Recommended: Prerequisites AREN 3540 and AREN 4550.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5890 (3) Sustainable Building Design

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4890

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4990

Requisites: Restricted to graduate students only.

Recommended: Prerequisites AREN 2120 and APPM 2360.

Additional Information: Departmental Category: Building Systems Engineering

AREN 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Building Systems Engineering

AREN 6950 (1-6) Master's Thesis

Additional Information: Departmental Category: Building Systems Engineering

AREN 6960 (1-3) Master's Report

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Building Systems Engineering

AREN 8990 (1-10) Doctoral Thesis

A minimum of 30 credit hours is required.

Additional Information: Departmental Category: Building Systems Engineering

Architectural Engineering - Master of Science (MS)

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental and Architectural Engineering. The department offers a Master of Science degree with study emphases in several major areas:

- building systems engineering
- construction engineering and management
- engineering for developing communities

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

Concurrent Degree Program BS/MS in Architectural Engineering

A concurrent BS/MS degree program in architectural engineering is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate BS degree (including completed and in-progress courses). Once accepted into the program, students are allowed to count 6 credit hours taken at the graduate level for both the BS and MS degrees (if certain grade and GPA requirements are met); this allows a student to obtain both degrees in five to six years.

For more information, visit the BS/MS Program (<http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) webpage.

Requirements

For a Master of Science (MS) degree in architectural engineering, students may undertake Plan I (with a thesis) or Plan II (based on course work).

Up to 6 hours of independent study may be taken, where an individual course of study is worked out between the student and a faculty member. Up to 9 hours of graduate courses can be transferred from another institution. Students are allowed up to 6 credits in total of non-technical course work for the MS/PhD degree.

Degree Plans

Plan I: Thesis Option

Plan I requires 24 credit hours of course work, plus 6 credit hours of thesis work. The thesis is a formal research report that discusses an organized research topic. Experience has shown that it takes a student from 24 to 30 months to complete this plan. Financial support is generally limited to exceptionally well-qualified students selecting Plan I.

Plan II: Non-Thesis Option

Plan II requires 30 credit hours of course work. It can be successfully completed in 18–24 months by a diligent student. With the approval of the advisor, non-CEAE courses at the 4000 level may be used for graduate credits up to a maximum of 6 hours. Note that one-half of the course work must be taken in the CEAE Department (an exception may be made if the relevant courses were taken as part of an undergraduate degree).

- Plan IIa: The 30 hours of course work may include a 3-credit hour Master's Thesis (AREN 6950) or Master's Report (AREN 6960).
- Plan IIb: For students with previous research and/or industry experience who achieve a minimum cumulative GPA of 3.75, the 30 hours of course work may be all formal course work. In addition, those students pursuing Plan IIb must take a final exit examination. Departmental approval is required for Plan IIb.

Architectural Engineering - Doctor of Philosophy (PhD)

Graduate studies in architectural engineering are offered through the Department of Civil, Environmental and Architectural Engineering. The department offers a PhD degree with study emphases in several major areas:

- building systems engineering
- construction engineering and management
- engineering for developing communities

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

Requirements

For a Doctor of Philosophy degree (PhD) in architectural engineering, students need at least 30 hours of graduate-level course work plus a dissertation.

For an entrant from another university, up to 21 hours of acceptable graduate courses may be transferred, leaving at least 9 hours of course work to be completed at the University of Colorado upon the approval of their advisors. The transfer credits are transferable at the discretion of the research advisor, and students may be asked to take additional courses toward the completion of their degree. Work already applied toward a graduate degree received from the University of Colorado or another institution cannot be accepted for transfer toward another graduate degree of the same level at the University of Colorado. All courses accepted for transfer must be graduate-level courses. A course in which a grade of B- or lower was received will not be accepted for transfer.

For students already in the MS program in the CEAE department, 30 hours of graduate course work performed at CU is applicable towards the PhD degree upon the approval of their advisors. The PhD also requires

that 30 hours of dissertation credit be taken, with a minimum residency of 2 years. After passing the comprehensive exam, PhD candidates are required to maintain continuous registration. Candidates must register for at least 5 hours of dissertation credits each semester.

Preliminary Examination

Each doctoral student shall take a preliminary examination as determined by the faculty of the specialty area in which the student is enrolled, normally not later than 12 months from the time the student is first enrolled in the doctoral program. Each CEAE group has a designated time for PhD students to take the exam. Students should discuss the schedule, date and format of the exam with their academic adviser.

Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination, which shall consist of a written and an oral examination in the field of concentration and related fields. At the comprehensive examination, the student shall present a plan for the dissertation research to the Advisory Committee for approval.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Chemical Engineering

The Department of Chemical and Biological Engineering (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) (ChBE) offers an innovative graduate program and emphasizes the doctoral degree. ChBE's outstanding national and international students take advantage of the high level of faculty-student collaboration and benefit from access to three interdisciplinary research centers. Department faculty and students have won numerous awards both nationally and internationally.

General research areas within the Department of Chemical and Biological Engineering include: biomaterials, biopharmaceutical engineering, catalysis, surface science and reaction engineering, complex fluids and microfluidic devices, computational science; energy and environmental applications, membranes and separations, metabolic engineering and directed evolution, nanostructured films and devices, polymer chemistry and engineering, and tissue engineering.

ChBE is one of the top research departments in the nation and maintains sophisticated facilities to support research endeavors. Although research in the department spans many diverse fields, there is a particular emphasis on research in biological engineering, functional materials, and renewable energy.

Biological engineering research includes a broad collection of focal areas spanning from the molecular scale (metabolites, genes, proteins) to the cellular and multicellular scales. Biological engineering projects account for a significant portion of the research activity within the ChBE Department. This research is supported in a variety of manners: federal

grants (NIH, NSF, DOD, etc.), national foundations (Howard Hughes, Cystic Fibrosis, etc.), and industrial collaborators.

Functional Materials research in the ChBE Department is concentrated in a diverse group of research areas including polymers, nanostructured materials, photovoltaic materials, ultrathin films, catalytic materials, computational materials science, self-assembled monolayers, and liquid crystalline materials. The department has strength in studying materials problems at the nanometer and sub-nanometer length scales. Such fundamental investigations are directed toward technological applications.

Finally, the ChBE Department has an active program in renewable energy research. Studies range from the production and utilization of hydrogen to materials for photovoltaics to biorefining and biofuels research. A number of efforts focus on developing catalysts for converting water to hydrogen and CO₂ into fuels such as CO and methanol. Another area of focus is the study of novel photovoltaic materials and structures involving organic, inorganic, and hybrid structures for efficient solar energy harvesting.

Course code for this program is CHEN.

Master's Degrees

- Chemical Engineering - Master of Science (MS) (p. 1201)

Doctoral Degree

- Chemical Engineering - Doctor of Philosophy (PhD) (p. 1202)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anseth, Kristi S (https://experts.colorado.edu/display/fisid_103471)
Distinguished Professor; PhD, University of Colorado Boulder

Bowman, Christopher (https://experts.colorado.edu/display/fisid_102043)
Distinguished Professor; Professor; PhD, Purdue University

Bryant, Stephanie J (https://experts.colorado.edu/display/fisid_111810)
Associate Professor; PhD, University of Colorado Boulder

Cha, Jennifer N (https://experts.colorado.edu/display/fisid_151746)
Associate Professor; PhD, University of California-Santa Barbara

Chatterjee, Anushree (https://experts.colorado.edu/display/fisid_151712)
Assistant Professor; PhD, University of Minnesota Central office

Clough, David Edwards (https://experts.colorado.edu/display/fisid_102332)
Professor; PhD, University of Colorado Boulder

Davis, Robert H (https://experts.colorado.edu/display/fisid_105896)
Professor; PhD, Stanford University

deGrazia, Janet (https://experts.colorado.edu/display/fisid_107661)
Senior Instructor; PhD, University of Colorado Boulder

Falconer, John L (https://experts.colorado.edu/display/fisid_101426)
Professor; PhD, Stanford University

Fox, Jerome Michael (https://experts.colorado.edu/display/fisid_156682)
Assistant Professor; PhD, University of California-Berkeley

Gill, Ryan T. (https://experts.colorado.edu/display/fisid_122697)
Professor; PhD, University of Maryland College Park Campus

Gin, Douglas L. (https://experts.colorado.edu/display/fisid_122861)
Professor; PhD, California Institute of Technology

Goodwin, Andrew Pratt (https://experts.colorado.edu/display/fisid_151595)
Assistant Professor; PhD, University of California-Berkeley

Heinz, Hendrik (https://experts.colorado.edu/display/fisid_156488)
Associate Professor; PhD, ETH Zurich (Switzerland)

Holewinski, Adam P (https://experts.colorado.edu/display/fisid_155859)
Assistant Professor; PhD, University of Michigan Ann Arbor

Hrenya, Christine M (https://experts.colorado.edu/display/fisid_113245)
Professor; PhD, Carnegie Mellon University

Kaar, Joel L. (https://experts.colorado.edu/display/fisid_148491)
Assistant Professor; PhD, University of Pittsburgh

Mahoney, Melissa J (https://experts.colorado.edu/display/fisid_129517)
InstructorLecturer; PhD, Cornell University

Medlin, James William (https://experts.colorado.edu/display/fisid_122699)
Professor; PhD, University of Delaware

Musgrave, Charles Bruce (https://experts.colorado.edu/display/fisid_144977)
Professor; PhD, California Institute of Technology

Nagpal, Prashant (https://experts.colorado.edu/display/fisid_151726)
Assistant Professor; PhD, University of Minnesota Central office

Noble, Richard D (https://experts.colorado.edu/display/fisid_101068)
Professor; PhD, University of California-Davis

Nuttelman, Charles Raymond (https://experts.colorado.edu/display/fisid_142758)
Instructor; PhD, University of Colorado Boulder

Randolph, Theodore W (https://experts.colorado.edu/display/fisid_101768)
Professor; PhD, University of California-Berkeley

Schwartz, Daniel K. (https://experts.colorado.edu/display/fisid_118479)
Professor; PhD, Harvard University

Shirts, Michael R (https://experts.colorado.edu/display/fisid_156474)
Associate Professor; PhD, Stanford University

Weimer, Alan W (https://experts.colorado.edu/display/fisid_109152)
Professor; PhD, University of Colorado Boulder

Young, Wendy Mores (https://experts.colorado.edu/display/fisid_146942)
Senior InstructorInstructor; PhD, University of Colorado Boulder

Courses

CHEN 5090 (1) Seminar in Chemical Engineering

Required of all chemical engineering graduate students. Includes reports on research activities and on special current topics.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

CHEN 5127 (3) Applied Statistics for the Manufacturing and Process Industries

Discusses the concepts and techniques of applied statistics essential to quality control and product/process improvement. Includes computer control (SQC/SPC), sampling methods and time series analysis, and methods of experimental design.

Requisites: Requires prerequisite course of MCEN 4120 (minimum grade D-).

CHEN 5128 (3) Applied Statistics In Research and Development

Students learn current and emerging statistical methods that are appropriate to experimentation in research and development activities. Statistical design of experiments and model fitting is emphasized. Department enforced prereq.: one introductory probability/statistics course.

CHEN 5210 (3) Transport Phenomena

Considers continuum mechanics, emphasizing fundamental relationships for fluid mechanics and heat transfer and their applications to engineering problems. Department enforced prerequisites: undergraduate courses in fluid mechanics, heat transfer, and differential equations.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

CHEN 5333 (3) Research Methods and Ethics

Prepares graduate students to carry out independent research. Research ethics, laboratory skills, experimental methods, critical thinking, presentations, proposal preparation and career planning are discussed. Independent research project carried out under direction of chemical engineering faculty.

Requisites: Restricted to graduate students only.

CHEN 5343 (1) Research Methods and Ethics Seminar

Prepares graduate students to carry out independent research. Focuses on topics such as safety, ethics, communication skills, data analysis, intellectual property considerations, and time management.

Requisites: Restricted to graduate students only.

CHEN 5360 (3) Catalysis and Kinetics

Studies principles of chemical kinetics and catalytic reactions, emphasizing heterogeneous catalysis.

Requisites: Requires corequisite course of CHEN 4330. Restricted to Chemistry (CHEM) or Chemical Engineering (CHEN) graduate students only.

CHEN 5370 (3) Intermediate Chemical Engineering Thermodynamics

Reviews fundamentals of thermodynamics, application to pure fluids and mixtures, and physical equilibrium and changes of state. Examines the equation of state and computation of fluid properties for pure fluids, mixtures and solutions. Also looks at relations between thermodynamics and statistical mechanics. Department enforced prerequisite: an undergraduate course in chemical thermodynamics.

Requisites: Restricted to graduate students only.

CHEN 5390 (3) Chemical Reactor Engineering

Studies ideal and nonideal chemical reactors, including unsteady state behavior, mixing effects, reactor stability, residence time distribution and diffusion effects. Department enforced prerequisite: undergraduate course in chemical reactor design/kinetics.

CHEN 5420 (3) Physical Chemistry and Fluid Mechanics of Interfaces

Covers thermodynamics of interfaces and surface tension measurement; adsorption at liquid-gas, liquid-liquid, and solid-gas interfaces; monolayers; conservation equations for a fluid interface; rheology of interfaces; surface tension driven flows; contact angle and wettability; and double layer phenomena.

Requisites: Requires prerequisite course of CHEN 3200 (minimum grade D-).

CHEN 5450 (3) Polymer Chemistry

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4450

CHEN 5460 (3) Polymer Engineering

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4460

CHEN 5630 (1) Intellectual Property Law and Engineering

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4630

Requisites: Restricted to graduate students only.

CHEN 5650 (3) Particle Technology

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates. Extra work required for graduate course.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4650

CHEN 5670 (3) Environmental Separations

Lect. Covers traditional, as well as new, chemical separations processes that have environmental applications. Includes chemically benign processing (pollution prevention) as well as approaches to address existing pollution problems.

CHEN 5740 (3) Analytical Methods in Chemical Engineering

Presents applied analytical and numerical mathematical methods in the context of chemical engineering problems. Topics include modeling techniques, algebraic equations, and ordinary and partial differential equations. Department enforced requisite: working knowledge of computing, calculus, differential equations, linear algebra, and vector operations; and undergraduate courses in physics, fluid mechanics, heat transfer, and reaction engineering.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

CHEN 5750 (3) Numerical Methods in Chemical Engineering

Covers numerical methods for solving ordinary differential, partial differential, and integral equations. These principles are employed to develop, test, and assess computer programs for solving problems of interest to chemical engineers.

Requisites: Restricted to graduate students only.

CHEN 5800 (3) Bioprocess Engineering

Reviews the recent developments in the fields of microbiology, molecular genetics, and genetic engineering that are of commercial value and benefit to mankind. Covers engineering implementation of such biological processes.

CHEN 5803 (3) Metabolic Engineering

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4803

Requisites: Requires prerequisite courses of APPM 2360 and CHEM 4731 or CHEM 4611 (all minimum grade C-).

CHEN 5805 (3) Biomaterials

Provides an overview of biomaterials. Covers major classes of materials used in medical applications, properties, degradation mechanisms, and characterization methods, foreign body response, methods to control physiological response to biomaterial surfaces, biocompatibility, biomaterials used in soft and hard tissue replacements, drug delivery devices and tissue engineering, and design criteria for developing a material for a given biological application.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4805

Requisites: Restricted to graduate students only.

CHEN 5830 (1) Introduction to Modern Biotechnology

Introduces students to the biotechnology enterprise. Topics include the biotechnology industry and profession, the various academic disciplines of biotechnology, intellectual property, financing, and ethics.

CHEN 5831 (2) Biotechnology Case Studies

Capstone course required of all graduate students in the interdisciplinary graduate biotechnology certificate program. Reviews molecular genetics, product synthesis and purification, economics, intellectual property, and business planning. Working in teams, students present a biotechnology product plan.

Requisites: Requires prerequisite course of CHEN 5830 (minimum grade D-).

CHEN 5835 (3) Colloids and Interfaces

Provides a deep exploration of the fundamental principles of colloid and interface science and of related applications. Core topics include fundamental equations of interfacial science, capillary phenomena, interfacial thermodynamics interfaces, molecular monolayers, electrical surface properties, and interfacial forces. Advanced topics include wetting phenomena, adsorption isotherms, dynamic interfacial behavior, surface modification, tribology, surfactant self-assembly, and foams/emulsions among others.

Requisites: Requires prerequisite course of CHEN 3320 (minimum grade C-).

CHEN 5836 (3) Nanomaterials

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4836

Requisites: Restricted to graduate students only.

CHEN 5838 (1-3) Special Topics in Chemical Engineering

Graduate-selected topics courses offered upon demand.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CHEN 5840 (1-4) Independent Study

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CHEN 5900 (3) Pharmaceutical Biotechnology

Incorporates biochemistry, pharmaceutical science, and engineering for application in the pharmaceutical industry. Emphasizes microscale mechanisms affecting drug delivery, bioavailability, and stability. Specific topics include thermodynamics of macromolecular conformational stability, crystallization kinetics, interfacial phenomena, and industrial protein folding.

Requisites: Restricted to graduate students only.

CHEN 5919 (1-5) Special Topics in CHBE

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEN 6210 (3) Microhydrodynamics of Suspensions and Colloids

Focuses on fluid mechanics and colloid science of suspensions of particles, cells, and drops. Covers fundamentals, applications, and research frontiers.

Requisites: Requires prerequisite course of CHEN 5210 (minimum grade D-).

CHEN 6820 (3) Biochemical Engineering Fundamentals

Covers design and operation of fermentation processes, microbial and enzyme kinetics, multiple substrate and multiple species of fermentation, regulation of enzyme activity, energetics of cellular growth, immobilized enzyme and cell reactors, and transport phenomena in microbial systems and downstream processing.

Requisites: Restricted to Chemistry (CHEM), Chemical Engineering (CHEN) or Biological Sciences (MCDB) graduate students only.

CHEN 6940 (1) Master's Candidate

Grading Basis: Pass/Fail

CHEN 6950 (1-6) Master's Thesis**CHEN 8990 (1-10) Doctoral Thesis**

Chemical Engineering - Master of Science (MS)

The Master of Science degree in chemical engineering requires 30 hours of approved course work and successful completion of a comprehensive final exam or thesis defense.

For more information, visit the department's Why ChBE for Graduate School? (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) webpage.

Note: The department does not accept students interested in a terminal master's degree except under special circumstances. Students generally obtain a master's degree in the course of fulfilling the requirements for the chemical engineering PhD (p. 1202) degree.

Concurrent Degree Program

BS/MS in Chemical Engineering or Chemical and Biological Engineering

The concurrent BS/MS program in the Department of Chemical and Biological Engineering enables especially well qualified students to work concurrently towards a BS in chemical engineering or chemical and biological engineering and an MS degree in chemical engineering. Students are admitted into the program during the spring of their junior year and begin planning a graduate program. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of their BS degree requirements.

Requirements

Admission Requirements

General criteria for regular admission to the master's program include a bachelor's degree with a 3.25/4.00 or better overall GPA from a college or university of recognized standing, equivalent to the degree given at this university (or college work equivalent to that required for such a degree, at least 96 credit hours of which must be acceptable toward a degree at this university)# promise of ability to pursue advanced study and research, as judged by previous scholastic record or otherwise# and adequate preparation to begin graduate study in the chosen field.

General Degree Requirements

The following course requirements are subject to change; for the most current information, visit the department's Why ChBE for Graduate School? (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) webpage.

A candidate for the Master of Science degree in chemical engineering must complete at least 30 credit hours, including at least 24 credit hours of course work and 4–6 credits of MS thesis.

Only courses 5000-level and above may be applied towards the MS degree. Moreover, only courses at the 5000-level and above in any department count toward the PhD degree. An advisor must approve all courses.

Only those courses for which the student receives a grade of B- or better will count toward the MS degree. The overall grade point average must be 3.00 or better.

A successful oral defense of the MS thesis is required.

Required Courses and Semester Credit Hours

Required Courses

CHEN 5090	Seminar in Chemical Engineering	1
CHEN 5210	Transport Phenomena	3
CHEN 5740	Analytical Methods in Chemical Engineering	3
Choose one of the following:		3
CHEN 5370	Intermediate Chemical Engineering Thermodynamics	
CHEN 5390	Chemical Reactor Engineering	

Total Credit Hours 10

Additionally, 15 of the total required credit hours must be chemical and biological engineering courses, and pass/fail courses do not count toward the degree.

A degree plan must be prepared at the beginning of the academic program in consultation with an advisory committee. The student is urged to maintain close contact with this advisory committee during the entire course of study.

Residence and Time Limit

It is expected that a qualified student can complete the MS degree in two years or less. All work, including the thesis defense and filing of the thesis with the Graduate School, must be completed in the two year requirement.

Chemical Engineering - Doctor of Philosophy (PhD)

The Department of Chemical and Biological Engineering (ChBE) offers an innovative graduate program that emphasizes the doctoral degree. ChBE's outstanding national and international students take advantage of the high level of faculty-student collaboration and benefit from access to three interdisciplinary research centers. Department faculty and students have won numerous awards both nationally and internationally.

General research areas within ChBE include: biomaterials, biopharmaceutical engineering, catalysis, surface science and reaction engineering, complex fluids and microfluidic devices, computational science, energy and environmental applications, membranes and separations, metabolic engineering and directed evolution, nanostructured films and devices, polymer chemistry and engineering, and tissue engineering.

ChBE is one of the top research departments in the nation and maintains sophisticated facilities to support research endeavors. Although research in the department spans many diverse fields, there is a particular emphasis on research in biological engineering, functional materials and renewable energy.

For more information, visit the department's Why ChBE for Graduate School? (<http://www.colorado.edu/chbe/academics/why-chbe-graduate-school>) webpage.

Requirements

Course Requirements

The student must work out an informal degree plan early in the PhD program with the aid of a research committee. This degree plan must include a total of at least 30 semester hours of 5000-level or above courses, not including pass/fail courses, and at least 30 semester hours of doctoral thesis credits.

Students are expected to complete with distinction all work in the formal courses that apply toward the degree, and achieve an overall grade-point average of 3.00 or better. A course grade below B- will not be counted toward the minimum requirements for the PhD degree, but it will be considered in the overall grade-point average.

Preliminary Examination

A preliminary examination is required of all PhD candidates. This examination consists of an oral and written component to be completed in the second semester (for candidates entering with an MS) or third semester (for students entering with a bachelor's degree). In addition, all students entering the program without a degree closely related to chemical engineering must either take the FE exam or have completed four chemical engineering core undergraduate courses with a grade of B

or better (Fluids/Heat, Mass Transfer, Thermodynamics, Kinetics, or the equivalent courses). The graduate director or department chair will make assessments as to whether a degree is closely related to the chemical engineering degree.

Comprehensive Examination

Students must complete and pass an oral examination before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School. This is followed by a group question-and-answer period with all committee members. The oral examination before the committee is based primarily on a written report the student provides to committee members two weeks in advance.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Civil Engineering

Graduate studies in civil engineering are offered through the Department of Civil, Environmental and Architectural Engineering (<http://www.colorado.edu/ceae>). Fields emphasized in civil engineering include geotechnical engineering and geomechanics, structural mechanics and engineering, construction management and engineering, environmental and geoenvironmental engineering, hydrology, environmental fluid mechanics, civil engineering systems, and engineering science.

The Graduate Record Examination (GRE), consisting of the aptitude tests and advanced test in engineering, is used to evaluate Master of Science and Doctor of Philosophy candidates. Candidates who submit GRE scores may be more likely to be considered for financial assistance.

Course code for this program is CVEN.

Research Interests and Facilities

The department has a wide variety of research facilities, including a 15g-ton centrifuge for geotechnical and structural model studies and a large 440g-ton geotechnical centrifuge for use in model testing. Also available is an instructional computing facility, the Bechtel Laboratory and the M.Y. Leung Computational Laboratory for Soils and Structures, both equipped with Windows and Linux high-performance workstations. In addition, extensive structural engineering, engineering mechanics and geotechnical capabilities exist such as a one-million-pound universal testing machine and several cubical cells for multi-axial testing of materials. A 40 ft. by 80 ft. structural strong floor with associated equipment permits the testing of a wide variety of structural configurations under controlled, both static and dynamic, loading. The hydraulics and water resources research laboratories include excellent facilities in water quality and environmental engineering. A unique workstation laboratory for advanced decision support systems is available. Programs in construction management and building energy are well supported. The 3600 sq. ft. mechanical and energy laboratory is capable of testing full-scale, commercial building systems and their controls using a one-of-a-kind data acquisition and experimental control

system. The laboratory has been recently redesigned and renovated for maximum flexibility to encourage a wide variety of research and testing procedures.

The Environmental Engineering program maintains approximately 12,000 sq. ft. of laboratories in the areas of process research, environmental microbiology, environmental chemistry, water quality, air quality, molecular biology, toxicology, and field ecology. The Environmental Sustainability cluster and the Center for Environmental Mass Spectrometry offer formal collaborations between the CU Boulder Environmental Engineering Group, the Mechanical Engineering air research group, the US Geological Survey, and industry partners, providing state-of-the-art facilities for research and teaching.

The Center for Advanced Decision Support for Water and Environmental Systems (CADSWES) is an interdisciplinary center of excellence, housed within the Department of Civil, Environmental and Architectural Engineering. CADSWES focuses on applying advanced computing techniques to provide decision makers with decision support systems (DSSs) to help them more effectively manage water and environmental systems.

Current research covers such topics as water and wastewater treatment, surface and subsurface contaminant transport, decision support systems, hydraulic research, land treatment, rapid infiltration and activated sludge processes. Cost prediction in construction, construction management, energy conservation in buildings, solar applications, and lighting systems are included. Advances in soil mechanics, rock mechanics, soil dynamics and geotechnical earthquake engineering, foundation engineering, computational geomechanics, centrifugal modeling, geosynthetics and glacier flows have been produced. Research in structures includes stability, damage and fracture, material microstructures, durability, finite element modeling, reinforced concrete, earthquake responses, reinforced masonry structures, prestressed concrete and dynamic control.

Master's Degrees

- Civil Engineering - Master of Science (MS) (p. 1213)
- Civil Engineering - Professional Master of Science (MSCVE) (p. 1214)

Doctoral Degree

- Civil Engineering - Doctor of Philosophy (PhD) (p. 1215)

Certificate

- Engineering for Developing Communities - Graduate Certificate (p. 1215)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amadei, Bernard (https://experts.colorado.edu/display/fisid_105978)
Professor; PhD, University of California-Berkeley

Amy, Gary L.
Professor Emeritus

Balaji, Rajagopalan (https://experts.colorado.edu/display/fisid_118480)
Professor; PhD, Utah State University

Ball, L. Duane
Professor Emeritus

Beamer, Charles Walter (https://experts.colorado.edu/display/fisid_151044)
Instructor; PhD, University of Colorado Boulder

Bielefeldt, Angela R (https://experts.colorado.edu/display/fisid_110322)
ProfessorAssociate ProfessorLecturer; PhD, University of Washington

Brandemuehl, Michael J.
Professor Emeritus

Chinowsky, Paul (https://experts.colorado.edu/display/fisid_125496)
Professor; PhD, Stanford University

Chung Feng, Chuan
Professor Emeritus

Cook, Sherri M. (https://experts.colorado.edu/display/fisid_154773)
Assistant Professor; PhD, University of Michigan Ann Arbor

Corotis, Ross (https://experts.colorado.edu/display/fisid_100942)
Professor; PhD, Massachusetts Institute of Technology

Corwin, Christopher J (https://experts.colorado.edu/display/fisid_149043)
Instructor; PhD, University of Colorado Boulder

Crimaldi, John (https://experts.colorado.edu/display/fisid_115733)
ProfessorAssociate Professor; PhD, Stanford University

Dashti, Shideh (https://experts.colorado.edu/display/fisid_148493)
Assistant Professor; PhD, University of California-Berkeley

Diekmann, James E.
Professor Emeritus

Dilaura, David L.
Professor Emeritus

Dow, John O.
Professor Emeritus

Frangopol, Dan M.
Professor Emeritus

Goble, George G.
Professor Emeritus

Goodrum, Paul M. (https://experts.colorado.edu/display/fisid_151965)
Professor; PhD, University of Texas at Austin

Gooseff, Michael N (https://experts.colorado.edu/display/fisid_155922)
Associate Professor; PhD, University of Colorado Boulder

Gupta, Vijay
Professor Emeritus

Hallowell, Matthew Ryan (https://experts.colorado.edu/display/fisid_146163)
Associate Professor; PhD, Oregon State University

Hearn, George (https://experts.colorado.edu/display/fisid_101059)
Associate Professor; PhD, Columbia University In the City of New York

Henze, Gregor P. (https://experts.colorado.edu/display/fisid_146496)
Professor; PhD, University of Colorado Boulder

Hernandez, Mark T (https://experts.colorado.edu/display/fisid_107635)
Professor; PhD, University of California-Berkeley

Hubler, Mija H. (https://experts.colorado.edu/display/fisid_155134)
Assistant Professor; PhD, Northwestern University

Javernick-Will, Amy N (https://experts.colorado.edu/display/fisid_146430)
Associate ProfessorAssistant Professor; PhD, Stanford University

Kasprzyk, Joseph R. (https://experts.colorado.edu/display/fisid_151506)
Assistant Professor; PhD, Pennsylvania State University

Koster, Hon-Yim
Professor Emeritus

Krarti, Moncef (https://experts.colorado.edu/display/fisid_104154)
Professor; PhD, University of Colorado Boulder

Kreider, Jan F.
Professor Emeritus

Liel, Abbie Boggiano (https://experts.colorado.edu/display/fisid_146431)
Associate ProfessorAssistant Professor; PhD, Stanford University

Linden, Karl G. (https://experts.colorado.edu/display/fisid_143747)
Professor; PhD, University of California-Davis

Livneh, Ben (https://experts.colorado.edu/display/fisid_151999)
Assistant Professor; PhD, University of Washington

McKnight, Diane Marie (https://experts.colorado.edu/display/fisid_110517)
Professor; PhD, Massachusetts Institute of Technology

Molenaar, Keith Robert (https://experts.colorado.edu/display/fisid_102373)
Professor; PhD, University of Colorado Boulder

Montoya, Lupita Del Carmen (https://experts.colorado.edu/display/fisid_148045)
Assistant Professor; PhD, Stanford University

Neupauer, Roseanna Marie (https://experts.colorado.edu/display/fisid_134747)
Professor; PhD, New Mexico Institute of Mining and Technology

Pak, Ronald Y S (https://experts.colorado.edu/display/fisid_105977)
Professor; PhD, California Institute of Technology

Pfeffer, Tad (https://experts.colorado.edu/display/fisid_100207)
Professor; PhD, University of Washington

Porter, Keith Alan (https://experts.colorado.edu/display/fisid_145182)
Research Professor; PhD, Stanford University

Rajaram, Harihar (https://experts.colorado.edu/display/fisid_103246)
Professor; PhD, Massachusetts Institute of Technology

Regueiro, Richard A (https://experts.colorado.edu/display/fisid_134705)
Associate ProfessorAssistant Professor; PhD, Stanford University

Ren, Zhiyong (https://experts.colorado.edu/display/fisid_153479)
Associate Professor; PhD, Pennsylvania State University Central Office

Rosario-Ortiz, Fernando L. (https://experts.colorado.edu/display/fisid_146165)
Associate ProfessorAssistant Professor; PhD, University of California-Los Angeles

Ryan, Joseph N (https://experts.colorado.edu/display/fisid_101037)
Professor; PhD, Massachusetts Institute of Technology

Saouma, Victor (https://experts.colorado.edu/display/fisid_100429)
Professor; PhD, Cornell University

Sideris, Petros (https://experts.colorado.edu/display/fisid_153057)
Assistant Professor; PhD, SUNY at Buffalo

Silverstein, Joann (https://experts.colorado.edu/display/fisid_101482)
Professor; PhD, University of California-Davis

Song, Jeong-Hoon (https://experts.colorado.edu/display/fisid_154468)
Assistant Professor; PhD, Northwestern University

Srubar III, Wilfred V. (https://experts.colorado.edu/display/fisid_153058)
Assistant Professor; PhD, Stanford University

Strzepek, Kenneth M.
Professor Emeritus

Sture, Stein (https://experts.colorado.edu/display/fisid_104029)
Professor; PhD, University of Colorado Boulder

Summers, Luis L.
Professor Emeritus

Summers, R Scott (https://experts.colorado.edu/display/fisid_113151)
Professor; PhD, Stanford University

Tulin, Leonard G.
Professor Emeritus

Vasconez, Sandra L. (https://experts.colorado.edu/display/fisid_144198)
Senior Instructor; MA, University of Denver

Weers, Walter A.
Professor Emeritus

William, Kaspar J.
Professor Emeritus

Xi, Yunping (https://experts.colorado.edu/display/fisid_110518)
Professor; PhD, Northwestern University

Zhai, Zhiqiang (https://experts.colorado.edu/display/fisid_130604)
ProfessorAssociate Professor; PhD, Massachusetts Institute of Technology

Znidarcic, Dobroslov (https://experts.colorado.edu/display/fisid_104109)
Professor; PhD, University of Colorado Boulder

Courses

CVEN 5111 (3) Structural Dynamics

Focuses on the response of single- and multi-degree of freedom structures subjected to harmonic, impulsive and arbitrary loads (including earthquake base excitation). Sources and modeling of damping will be discussed. Analytical and numerical solutions will be considered for both linear and nonlinear structural systems. Elastic and inelastic response spectra will be discussed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5131 (3) Continuum Mechanics and Elasticity

Provides foundation for advanced study of structural, mechanical and geo-material behavior and continuum theories in mechanics. Topics: Cartesian tensors, formulation of continuum mechanics for small and large deformation, constitutive laws for elastic solids, energy principles, methods of potentials, formulations and solutions of 2D and 3D elastostatic and elastodynamic problems, analytical and numerical formulations.

Recommended: Prerequisite CVEN 4161.

Additional Information: Departmental Category: Mechanics

CVEN 5147 (3) Civil Engineering Systems

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4147

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 5161 (3) Advanced Mechanics of Materials I

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4161

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5206 (3) Design Development

Provides an overview of the development process and proforma, investigates the interrelationship between design decisions and building costs, and evaluates the impact of each major building system on the development budget and schedule. Provides a simulated development experience where students respond to a Request for Proposal, including proformas, design, estimates and outline specifications. Department consent required. Taught intermittently.

Additional Information: Departmental Category: Construction

CVEN 5216 (3) Applied Construction Financial Management

Teaches students to interpret commonly used financial reports in the construction engineering industry sector. Skills developed in this course will better prepare students to become competent consumers of financial information and influence future results the construction business. Models for financing public and private sector projects will also be explored. Taught intermittently.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5226 (3) Construction Safety

Comprehensively studies construction safety in the construction industry. Focuses on advanced safety management issues such as accident causation theory, economic modeling, safety risk quantification and analysis, design for safety, predictive analytics and learning. Skills developed in this course will prepare graduate students to be effective quality and safety managers or researchers.

Additional Information: Departmental Category: Construction

CVEN 5246 (3) Legal Aspects of Construction

Applies law in engineering practice; contracts, construction contract documents, construction specification writing, agency, partnership, and property; types of construction contracts; and legal responsibilities and ethical requirements of the professional engineer. Taught intermittently.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5276 (3) Engineering Risk and Decision Analysis

Acquaints students with the fundamental principles and techniques of risk and decision analysis. Oriented toward project-level decisions in which risk or uncertainty plays a central role. Introduces students to Monte Carlo analyses, and various types of multicriteria decision analyses. Culminates in a larger term project.

Recommended: Prerequisite CVEN 3227 and graduate standing or instructor consent required.

Additional Information: Departmental Category: Construction

CVEN 5286 (3) Design Construction Operations

Considers effective/efficient design of construction operations. Front end planning; construction labor relations; productivity management. Emphasizes construction productivity improvement by group field studies and discrete event simulation modeling. How overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment, human, and material resources.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5313 (3) Environmental Fluid Mechanics

Analysis of viscous incompressible flows, with first-principle solutions for environmental fluid flows in oceans, rivers, lakes and the atmosphere. Topics include the Navier-Stokes equations, kinematics, vorticity dynamics, geophysical fluid dynamics, and density stratification.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites APPM 2350 and APPM 2360 and CVEN 3313.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5323 (3) Applied Stream Ecology

Emphasizes the integration of hydrologic, chemical, and biological processes in controlling river, stream, and reservoir ecosystems at several spatial scales. Students apply ecosystem concepts to current environmental and water quality problems and learn field methods in field trips and a team project.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5333 (3) Physical Hydrology and Hydroclimatology

Introduces hydrology as a quantitative science describing the occurrence, distribution and movement of water at and near the surface of the earth. Develops a quantitative understanding of atmospheric water, infiltration, evapotranspiration and surface runoff. Studies global climatology and large scale climate drivers of regional hydrology at interannual time scales. Solves engineering problems related to water resources.

Requisites: Requires prerequisite courses of CVEN 5454 and CVEN 5537 (all minimum grade of C-). Restricted to graduate students only.

Recommended: Prerequisite CVEN 4333.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5343 (3) Transport and Dispersion in Surface Water

Studies transport and dispersion of introduced contaminants in turbulent surface water flows. Emphasizes developing a physical understanding of fluid processes responsible for turbulent dispersion. Includes analytical development, numerical modeling, and experimental approaches to the problem.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5346 (3) Managing Construction and Engineering Projects and Organizations

Explores organizational and managerial issues and concerns facing executives in engineering and construction organizations. Through readings, case studies, simulation exercises, and projects, students are introduced to and apply concepts of strategy, core competencies, vision, innovation, team dynamics, interpersonal influence, organizational design issues, and global projects to engineering and construction organizations.

Additional Information: Departmental Category: Construction

CVEN 5353 (3) Groundwater Hydrology

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 and APPM 2360.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5363 (3) Modeling of Hydrologic Systems

Introduces students to modeling techniques. Focus areas include physical hydrology and hydrometeorology; measurement and inference; climate change impacts; role of scale in hydrology; uncertainty analysis; and a case study project. Projects will examine hydrologic impacts of various drivers such as climate warming or land cover change, utilizing an assessment of historic conditions to better understand and model future disturbance scenarios.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5373 (3) Water Law, Policy, and Institutions

Discusses contemporary issues in water management based on legal doctrine. Identifies legal issues in water resources problems and discusses in close relationship with technical, economic, and political considerations.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5383 (3) Applied Groundwater Modeling

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4383

Recommended: Prerequisites APPM 2360 and CVEN 4353 or CVEN 5353.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5393 (3) Water Resources System and Management

Introduces water resources planning and management as an integrated systems problem that satisfies multiple competing objectives under constraints and uncertainty. Includes problem formulation and solution using decision support systems, optimization with and without uncertainty, stochastic simulation, and multiobjective optimization. Introduces water resources economics and planning under uncertainties such as climate change and increasing urbanization.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5404 (3) Water Chemistry

Introduces chemical fundamentals governing the chemistry of natural and treated waters. Topics include thermodynamics and kinetics of acid and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction, and sorption.

Requisites: Restricted to concurrent BS/MS (C-CVEN or C-EVENCVEN) or graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5414 (3) Water Chemistry Laboratory

Uses experimental and analytical laboratory techniques to develop a better understanding of the concepts of aquatic chemistry and to investigate water chemistry in treated and natural water systems. Techniques include titration, spectrophotometry, gas chromatography, other advanced instrumentation, sampling, portable analyses, and basic statistics and experimental design. Course focuses on water chemistry of Boulder Creek and other local waters.

Requisites: Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-). Requires corequisite course of CVEN 5424.

Additional Information: Departmental Category: Environmental

CVEN 5423 (3) Water Resources Engineering Design

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4323

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical processes that impact the fate and transport of organic contaminants in natural and engineered systems. Emphasizes both equilibrium and kinetic aspects, including solubility, vapor pressure, air-water exchange, sorption, abiotic redox reactions, and photodegradation.

Additional Information: Departmental Category: Environmental

CVEN 5434 (3) Environmental Engineering Design

Team-based design of facilities or processes for water or wastewater or solid waste treatment or remediation under multiple real-world constraints. Department consent required.

Recommended: Prerequisite CVEN 5524 or CVEN 5534 or CVEN 5474.

Additional Information: Departmental Category: Environmental

CVEN 5444 (3) Municipal Des Proj

Additional Information: Departmental Category: Environmental

CVEN 5454 (3) Statistical Methods for Natural and Engineered Systems

Applies traditional and modern probability and statistical methods to environmental, hydrological, climatological and engineering data analysis. Topics include: basic probability, data visualization, fitting univariate and multivariate distributions, Monte Carlo simulations, extreme value distributions, confidence intervals and hypothesis testing, nonparametric density estimators, linear regression, and Bayesian analysis. The data analysis tool, R, is used throughout the course.

Additional Information: Departmental Category: Environmental

CVEN 5464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4464 and EVEN 4464

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5474 (3) Hazardous and Industrial Waste Management

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4474

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5484 (3) Applied Microbiology and Toxicology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4484 and EVEN 4484

Additional Information: Departmental Category: Environmental

CVEN 5494 (3) Surface Water Quality Modeling

Examines the relationships among air, water, and landpollution, water quality, and beneficial uses. Using models, develops the ability to quantify and predict the impacts of pollutants in the aquatic environment, and to develop approaches to minimize unfavorable water quality conditions.

Department consent required.

Additional Information: Departmental Category: Environmental

CVEN 5511 (3) Introduction to Finite Element Analysis

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4511

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5514 (3) Bioremediation

Advanced study on biological processes used to treat toxic organic and inorganic compounds contained in contaminated water, air, and soil; design and evaluation of in situ toxic compound biotransformation; fundamentals of phytoremediation; critical reviews of current literature on bioremediation.

Recommended: Prerequisite CVEN 4484 or CVEN 5424 or CVEN 5484.

Additional Information: Departmental Category: Environmental

CVEN 5524 (3) Drinking Water Treatment

Provides advanced study on theory-of-treatment processes, including design and operation of municipal water supplies.

Recommended: Prerequisite CVEN 4464 or CVEN 5464 or graduate standing or instructor consent required.

Additional Information: Departmental Category: Environmental

CVEN 5525 (3) Matrix Structural Analysis

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4525

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5534 (3) Wastewater Treatment

Covers the processes used to treat municipal wastewater, focusing on biological processes. Includes: design of aerobic, anoxic, anaerobic and suspended growth technologies to remove and transform pollutants; design and assessment of treatment approaches that recover energy, nutrients and water from wastewater; application of fundamental concepts of aquatic chemistry, environmental microbiology and computational models.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 5404 and CVEN 5484 and CVEN 5464.

Additional Information: Departmental Category: Environmental

CVEN 5537 (3) Numerical Methods in Civil Engineering

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4537

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 5544 (3) Solid Waste Management and Resource Recovery

Covers the scope of the nonhazardous solid waste problem and regulations that drive its management; discussions of nonengineering factors that impact waste management and recycling; design of incinerators, composting facilities, and landfills used to treat and dispose of solid waste.

Recommended: Prerequisite CVEN 3414.

Additional Information: Departmental Category: Environmental

CVEN 5554 (3) Fundamentals of Air Quality Management

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Required for CVEN environmental engineering graduate students.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4554

Additional Information: Departmental Category: Environmental

CVEN 5555 (3) Structural Reliability

Explores principles and methods of structural reliability, and formulates bases for design to insure adequate safety and performance of elements and structural systems. Undergraduates may enroll with the permission of the instructor.

Requisites: Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5564 (3) Water Profession: Leadership & Communication

Develops and improves the skills and tools needed for graduate students and young professionals. Focusing on highly effective leaders; leadership with impact; effective communication tools; and communicating with teams, city councils, governing boards, and the public.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environmental

CVEN 5565 (3) Life-Cycle Engineering of Civil Infrastructure Systems

Philosophical and analytical issues for lifetime design and operation of civil systems. Optimization tradeoffs of construction, management, and sustainability. Utility of operation and service, including present-value economic analysis. Decision-making alternatives of safety and performance, including hazards consideration. Undergraduates may enroll with the permission of the instructor.

Recommended: Prerequisite CVEN 3227 or equivalent.

Additional Information: Departmental Category: Structures

CVEN 5574 (3) Water Utility Management: Current Issues and Future Challenges

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on management, leadership, communication and utility financial in the new water profession era. Undergraduate seniors may contact instructor for permission to enroll.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5575 (3) Advanced Topics in Steel Design

Covers steel structure design and analysis. Includes plate girders, moment connections for beams, design of multistory frames, and other topics determined by class interest. Undergraduate may enroll with permission of the instructor.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4545.

Additional Information: Departmental Category: Structures

CVEN 5584 (3) Water Profession: Financial and Management

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on financing water services, capital planning, rates, management planning, staffing and organization and critical thinking. Undergraduates may request instructor permission to enroll.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5585 (3) Advanced Topics in Reinforced Concrete Design

Covers design and analysis topics for prestressed concrete and/or reinforced concrete structures. Includes review of the current ACI design code, slabs, prestressed concrete, seismic design, folded plates and shells, finite element analysis, and other topics determined by class interest. Undergraduates may enroll with the permission of the instructor.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4555.

Additional Information: Departmental Category: Structures

CVEN 5594 (3) Water Reuse and Reclamation

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4594

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3141 and CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 5604 (3) UV Processes in Environmental and Engineered Systems

Provides a fundamental basis for design of UV processes in water and wastewater treatment. Includes principles of photochemistry and photobiology. Applications to disinfection of water and degradation of chemical compounds in the environment. Design of UV disinfection systems and reactors and advanced oxidation processes. Environmental UV-based decay of pollutants.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3414 and CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 5614 (3) Bioenergy & Bioresource Recovery

Introduces fundamental theories and applied technologies used in production and conversion of renewable biomass including waste materials into bioenergy and other value-added products. Conducts quantitative evaluations on conversion processes such as renewable biogas production, electricity generation, liquid fuels, metal and nutrients recovery and organic chemical production.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4484.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environmental

CVEN 5628 (3) Seepage and Slopes

Covers fundamental principles of seepage in soils under both saturated and unsaturated conditions and limit equilibrium solution to slope stability problems. The seepage effects on slope stability are analyzed in detail and both conventional slope stability method and the finite element technique are applied to solving the engineering problems.

Recommended: Prerequisites CVEN 3708 and CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5678 (3) Soil Improvement and Reinforcement

Provides students with principles and working knowledge of design and construction procedures in soil stabilization, retaining structures, geosynthetics, and soil reinforcement.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5688 (3) Environmental Geotechnics

Provides an understanding of the use of geotechnical concepts in the analysis and design of environmental systems. Focus is placed on the evaluation of waste containment facilities. Including relevant saturated, unsaturated, and multiphase flow mechanisms in cover and liner systems. Includes stability analyses for landfills and geosynthetic interface shear strength. Covers relevant aspects of mining geotechnics and remediation technologies of contaminated sites.

Additional Information: Departmental Category: Geotechnical

CVEN 5708 (3) Soil Mechanics

Offers an advanced course in soil mechanics. Coverage includes basic principles of continuum mechanics; elasticity, viscoelasticity, and plasticity theories applied to soils; effective stress principle; consolidation; shear strength; critical state concepts; and constitutive, numerical, and centrifuge modeling.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5718 (3) Mechanics and Dynamics of Glaciers

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4718

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5728 (3) Foundation Engineering

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4728

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5738 (3) Applied Geotechnical Analysis

Studies applications of limiting equilibrium and limit plasticity analysis methods to stability problems in geotechnical engineering, such as slopes, lateral earth pressures on retaining structures, and bearing capacities of foundations. Also includes elastic and consolidation analysis of deformations in soil structures.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5748 (3) Design of Earth Structures

Covers theory, design, and construction of earth embankments and waste facilities, including isolation systems. Uses published data, field exploration, and laboratory tests on soils and rock in investigating foundations and construction materials. Involves principles of compaction and settlement, permeability analysis, landslide recognition and control, use of composite clay, and liner systems.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5758 (3) Flow Processes in Soils

Examines fundamental principles of flow through porous media and related engineering problems. Topics include the saturated seepage theory and flow nets; the unsaturated flow theory; suction-saturation and saturation-hydraulic conductivity relationships; nonlinear finite strain consolidation and desiccation theory; laboratory and field testing methods for determining material characteristics; and numerical models for flow-related engineering problems.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5768 (3) Introduction to Rock Mechanics

Nature of rocks and rock masses; engineering properties rock and rock mass; rock mass classifications; planes of weakness; application of rock mechanics to design of rock slopes, underground excavations, and foundations.

Recommended: Prerequisites CVEN 3708 and CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5788 (3) Computational Modeling in Geotechnical Engineering

Introduces computational modeling for geotechnical engineering applications such as the Discrete Element Method (DEM) for granular materials, nonlinear Finite Element Analysis (FEA) of seepage, coupled soil elastoplastic consolidation, elastoplasticity models for soil and rock, and advanced computational methods for failure in soil and rock. Uses DEM, FEA, and other software programs for analysis.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5798 (3) Dynamics of Soils and Foundations

Covers fundamental characterization of soils, foundations and structures under general dynamic and earthquake loads. Principles of vibrations and wave propagation for 1D, 2D, 3D. In-situ and laboratory determination of dynamic soil properties; methods for site response analysis, foundation vibrations, dynamic soil-structure interaction and liquefaction problems.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5818 (3) Geotechnical Earthquake Engineering

Familiarizes students with the fundamentals of engineering seismology, soil and structural dynamics, and the modern practice of geotechnical earthquake engineering. Focuses on describing earthquake hazards and methods for seismic analysis and design.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 5798.

Additional Information: Departmental Category: Geotechnical

CVEN 5822 (3) Geographical Information Systems for Civil and Environmental Systems

Theory and use of geographical information systems in civil engineering, environmental studies, natural resources and other related disciplines.

Topics include spatial data models, data capture, global positioning system, database linkage, use in design, analysis and implementation. Laboratory work includes applications of Arc-View and Arc-GIS software.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 5830 (3) Special Topics for Seniors/Grads

Department consent required.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Building Systems

CVEN 5831 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5833 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5834 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5835 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5836 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Construction

CVEN 5837 (3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Additional Information: Departmental Category: Miscellaneous

CVEN 5838 (3) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Geotechnical

CVEN 5849 (1-3) Independent Study

Available only through approval of graduate advisor. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 5919 (3) Sustainable Community Development 1

Focuses on the fundamental tools necessary to address sustainable community development projects in low-income communities (LICs). Topics include: human development, sustainable development, and presentation of an integrative and participatory framework for development projects in LICs. The framework consists of a combination of development and engineering project management tools. Framework is illustrated through case studies and student-driven team projects.

Requisites: Restricted to students with sub-plan of Engineering Developing Communities (EDC).

Additional Information: Departmental Category: Special Topics

CVEN 5929 (3) Sustainable Community Development 2

Covers the principles, practices and strategies of appropriate technology as part of an integrated and systems approach to community-based development. Course content areas include technical issues in development, environmental health and communicable disease, appropriate and sustainable technologies with hands-on workshops, and global cooperation in development.

Requisites: Requires prerequisite course of CVEN 5919 (minimum grade C-). Restricted to students with EDC Sub-Plan.

Additional Information: Departmental Category: Special Topics

CVEN 5939 (3) Sustainable Community Development Field Practicum

Provides a supervised in-field practicum experience in which the student applies theories and concepts learned in CVEN 5919 and CVEN 5929.

Requisites: Requires prerequisites courses of CVEN 5919 and CVEN 5929 (all minimum grade C-). Restricted to students with sub-plan of Engineering Developing Communities (EDC).

Additional Information: Departmental Category: Miscellaneous

CVEN 5969 (1-3) Water, Sanitation, and Hygiene

Studies the fundamentals behind effective hygiene and remediation processes and engineering solutions developed/developed for specific international problems. Approaches to hygiene, clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3424 and CVEN 3414.

Additional Information: Departmental Category: Environmental

CVEN 6161 (3) Advanced Mechanics of Materials 2

Fundamentals of continuum mechanics, finite deformations, Lagrangian finite strains, Cauchy and Piola Kirchoff stress tensors, plasticity and thermo-elasticity, elements of damage mechanics, elements of fracture mechanics, rheological and viscoelastic theories, and modern experimental techniques.

Recommended: Prerequisite CVEN 5161.

Additional Information: Departmental Category: Mechanics

CVEN 6323 (3) Urban Stormwater Infrastructure Systems

Evaluation and design of more sustainable urban stormwater infrastructure systems including street inlets, on-line and off-line surface storage and infiltration systems. Integrated design for major, minor, and micro storms to provide flood control and drainage as well as control of pollution from stormwater runoff. Simulation and optimization models will be used.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6333 (3) Introduction to Multi-Scale Variability and Scaling in Hydrology

Provides a foundational physical understanding of channel networks, runoff, precipitation, and evapotranspiration at multiple spatial scales of drainage basins using modern analytical concepts for understanding non-linear phenomena, e.g., fractals, multifractals, statistical scaling, criticality, and renormalization.

Requisites: Requires a prerequisite course of CVEN 5333 (minimum grade C-).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6383 (3) Flow and Transport through Porous Media

Studies basic physics of flow and transport of water, air, and other fluid mixtures through a porous medium. Course topics are relevant to applications in contaminant hydrology, contaminant transport in aquifers, hazardous waste management, geohydrology, soil physics, and geoenvironmental engineering.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6393 (1) Hydrologic Sciences and Water Resources Engineering Seminar

Provides a broad introduction to a variety of research topics from hydrologic sciences and water resources engineering. Offered as a one-hour weekly seminar by the departmental water faculty, graduate students, and external speakers.

Requisites: Restricted to graduate student Civil (CVEN) Engineering students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6414 (3) Aquatic Surfaces and Particles

Examines the role of surfaces and particles in the fate and transport of contaminants in the aquatic environment. Emphasizes modeling of absorption, dissolution, precipitation, surface-catalyzed reactions, and coagulation and filtration kinetics.

Requisites: Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 6511 (3) Nonlinear Finite Element Analysis of Solids and Porous Media

Covers constitutive modeling, multiphase mechanics, and finite element implementation of constitutive models and coupled solid-fluid mechanical governing equations for inelastic porous media at small strain. Considers transient and steady state conditions. Analyzes structural, geotechnical, geological, mechanical, biomechanical, and other related modern engineering problems. Uses general purpose finite element software program for implementation and analysis.

Additional Information: Departmental Category: Mechanics

CVEN 6525 (3) Nonlinear Analysis of Framed Structures

Explores theoretical underpinnings of nonlinear static and dynamic analysis of framed structures, along with exposure to the corresponding programming techniques in Matlab. Topics covered are: flexibility and fiber based beam-column element formulation; structural, section and fiber plasticity; geometric and material nonlinearities; nonlinear pushover and transient analysis of framed structures.

Requisites: Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 6595 (3) Earthquake Engineering

Analyzes and designs structures for earthquake load covering: properties of earthquake ground motions, ground motion prediction equations, seismic hazard analysis, response spectra, response of linear and nonlinear structures, construction of design spectra, seismic design methods, and building code requirements.

Requisites: Requires prerequisite course of CVEN 5111 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 6830 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Building Systems

CVEN 6831 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 6832 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6833 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6834 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Environmental

CVEN 6835 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Structures

CVEN 6836 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Construction

CVEN 6837 (3) Sp Tpcs Comp Graphics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miscellaneous

CVEN 6838 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Geotechnical

CVEN 6839 (1-3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 6943 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6944 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Environmental

CVEN 6945 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Structures

CVEN 6946 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Construction

CVEN 6947 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

CVEN 6948 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Geotechnical

CVEN 6949 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Special Topics

CVEN 6951 (1-4) Master's Thesis

Additional Information: Departmental Category: Mechanics

CVEN 6952 (1-4) Master's Thesis

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6953 (1-6) Master's Thesis

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6954 (1-6) Master's Thesis

Additional Information: Departmental Category: Environmental

CVEN 6955 (1-6) Master's Thesis

Additional Information: Departmental Category: Structures

CVEN 6956 (1-6) Master's Thesis

Additional Information: Departmental Category: Construction

CVEN 6957 (1-4) Master's Thesis

Additional Information: Departmental Category: Miscellaneous

CVEN 6958 (1-6) Master's Thesis

Additional Information: Departmental Category: Geotechnical

CVEN 6959 (1-4) Master's Thesis

Additional Information: Departmental Category: Special Topics

CVEN 6961 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Mechanics

CVEN 6962 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6963 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6964 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Environmental

CVEN 6965 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Structures

CVEN 6966 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Construction

CVEN 6967 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miscellaneous

CVEN 6968 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Geotechnical

CVEN 6969 (1-3) Masters Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 7111 (3) Advanced Structural Dynamics

Includes general vibrations of civil engineering structures and their response to various types of time-dependent loads.

Requisites: Requires prerequisite course of CVEN 5111 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 7141 (3) Plates and Shells

Teaches mathematical theories of plate and shell structures and their applications. Involves numerical finite element solutions of plates and shells of various shapes under static and dynamic loadings.

Requisites: Requires prerequisite courses of CVEN 5131 or CVEN 5161 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 7161 (3) Fracture Mechanics

Includes three parts: 1) fundamentals through rigorous mathematical formulations of linear/nonlinear elastic fracture mechanics, 2) materials' theoretical strength, including metals, granular materials, polymers and steel, 3) numerical (finite element) methods in fracture mechanics. Heavy emphasis on project and independent work.

Requisites: Requires prerequisite courses of CVEN 5511 and CVEN 6161 (all minimum grade of C-).

Additional Information: Departmental Category: Mechanics

CVEN 7206 (1) CEM PhD Seminar

Provides an overview of the research process and research methods in construction engineering and management. Students will study and evaluate different research methods and designs in an aim to prepare students to conduct and evaluate research. Taught intermittently.

Additional Information: Departmental Category: Construction

CVEN 7511 (3) Computational Finite Inelasticity and Multiphase Mechanics

Covers kinematics, thermodynamics, coupled balance equations and constitutive models, numerical time integration, and finite element implementation of finite strain inelasticity and multiphase mechanics. Kinematics of multiplicative decomposition, and finite strain mixture theory. Linearization for global nonlinear Newton-Raphson and solution algorithm of nonlinear constitutive models and coupled balance equations.

Recommended: Prerequisites CVEN 5131 and CVEN 5511 and CVEN 6511.

Additional Information: Departmental Category: Mechanics

CVEN 7718 (3) Engineering Properties of Soils

Emphasizes engineering aspects of soil mechanics. Implications of soil strength, volume change, consolidation behavior in engineering problems such as slope stability, deformation of retaining walls, surface subsidence due to tunneling. Time effects in soil/long-term bearing capacity of piles. Laboratory determination of constitutive parameters of soils. Field tests/their correlations with soil properties. Case studies using finite element software.

Requisites: Requires prerequisite course of CVEN 5708 (minimum grade of C-).

Additional Information: Departmental Category: Geotechnical

CVEN 7788 (3) Soil Behavior

Topics include soil mineralogy, formation of soils through sedimentary processes and weathering, determination of soil composition, soil water, colloidal phenomena in soils, fabric property relationships, analysis of mechanical behavior including compressibility, strength and deformation, and conduction phenomena in terms of physicochemical principles. Involves applications for stabilization and improvement of soils, and disposal of waste materials.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 7831 (1-3) Sp Tpc-Constitutive Mech

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Mechanics

CVEN 7838 (3) Special Topics

Additional Information: Departmental Category: Geotechnical

CVEN 7849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 8849 (3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 8991 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Mechanics

CVEN 8992 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Surveying and Transportation

CVEN 8993 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 8994 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Environmental

CVEN 8995 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Structures

CVEN 8996 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Construction

CVEN 8997 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Miscellaneous

CVEN 8998 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Geotechnical

CVEN 8999 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Special Topics

Civil Engineering - Master of Science (MS)

The department's objective is to produce engineers capable of identifying, preventing and solving building, construction and environmental problems. In addition to the well-established graduate programs in environmental, water resource and geotechnical engineering, students in the department may also choose to study in the emerging field of geoenvironmental engineering. Campus facilities, including a National Science Foundation-funded earthquake simulator, permit a case-study approach, which exposes students to real-world problems and allows experimentation, testing and analysis.

Areas of study within the Civil Engineering Department are:

- building systems engineering
- construction engineering and management
- engineering for developing communities
- environmental engineering
- geoenvironmental engineering
- geotechnical engineering
- civil systems engineering
- engineering science
- structural engineering
- hydrology, water resources and environmental fluid mechanics
- water engineering and management

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

Concurrent Degree Programs BS/MS in Civil Engineering

A concurrent BS/MS degree program in civil engineering is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate BS degree (including completed and in-progress courses). Once accepted into the program, students are allowed to count 6 credit hours taken at the graduate level for both the BS and MS degrees (if certain grade and GPA requirements are met); this allows a student to obtain both degrees in five to six years.

For more information, visit the department's BS/MS Program (<http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) webpage.

BS/MS in Architectural and Civil Engineering

A concurrent architectural engineering BS and civil engineering MS degree program is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate BS degree (including completed and in-progress courses). Once accepted into the program, students are allowed to count 6 credit hours taken at the graduate level for both the BS and MS degrees (if certain grade and GPA requirements are met); this allows a student to obtain both degrees in five to six years.

For more information, visit the department's BS/MS Program (<http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) webpage.

BS/MS in Environmental and Civil Engineering

A concurrent environmental engineering BS and civil engineering MS degree program is available. Students may apply to the program when they have 75–110 credit hours toward the undergraduate EVEN degree (including completed and in-progress courses). Once accepted into the program, students may be allowed to count 6 credit hours taken at the graduate level for both the environmental engineering BS and the civil engineering MS degrees, thus allowing them to obtain both degrees in five to six years.

For more information, visit the department's BS/MS Program (<http://www.colorado.edu/ceae/current-students/undergraduate-studies/bsms-program>) webpage.

Requirements

Course Requirements

The Master of Science degree in civil engineering requires a total of 30 credit hours (including course work and thesis hours) with a grade of B- or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000 level or above, and at least 18 of those credits must be in CVEN courses. In addition, specific focus area requirements must be met.

Students may apply up to 6 credit hours of approved 4000 level courses from departments outside CEAE to their master's degree if the courses fit with the student's degree plan.

Degree Plans

Plan I: Thesis Option

Students must complete 6 credit hours of MS thesis. Plan I culminates with an oral presentation and/or written report or oral examination.

Plan II: Non-Thesis Option

There are two non-thesis options:

- Students choosing Plan IIa must complete at least 30 credit hours of course work, including a 3-credit independent study report.
- Students choosing Plan IIb must complete at least 30 credit hour of course work and pass a final exam.

Time Limit

All degree requirements must be completed within four years of the date of commencing course work. Most students complete the degree in one to two years.

Civil Engineering - Professional Master of Science (MSCVE)

The department of Civil, Environmental and Architectural Engineering offers a professional master's degree tailored toward working engineers who desire to develop a new skill set. The programs are course work based and result in a Master of Science degree.

Areas of Emphasis

Water Engineering and Management Emphasis

The goal of the professional master's degree program in civil engineering with an emphasis in water engineering & management (WEM) is to provide working engineers with the skills they need to lead a team, initiative or division in the water profession. It's especially relevant for young professionals working for consulting engineers, utilities, manufacturers, and government or regulatory agencies.

The program combines technical courses of the environmental engineering MS degree with professional courses that address leadership, management, communication, finance, and governance in the water profession.

The program curriculum is developed and taught by world-class faculty and senior professionals from:

- CU Boulder's Department of Civil, Environmental, and Architectural Engineering
- CU Denver's School of Public Affairs
- water utilities' executive and senior professionals from across the U.S.
- consulting firms and global professional organizations
- American Water Works Association
- Water Environment Federation

For more information, visit the department's Water Engineering & Management (<http://www.colorado.edu/ceae/research/interdisciplinary-programs/water-engineering-management>) webpage.

Engineering for Developing Communities Emphasis

With a professional master's degree in civil engineering with an emphasis in engineering for developing communities, students will connect classroom learning and hands-on collaboration with organizations

internationally to work towards providing solutions to complex global and local problems. The Mortenson Center in Engineering for Developing Communities (MCEDC) trains engineers to work in partnership with people from developing communities worldwide to create sustainable solutions to meet basic needs.

This program merges the skill sets and knowledge of engineering with international development. We offer our students the opportunity to specialize in an option area of their choice, including: construction, energy, environmental engineering, engineering management, global health, policy, or a self-designed topic.

Our graduates are able to provide technical expertise to development agencies or other firms by recognizing the many facets of community development that are critical to sustainable solutions. Students gain skills in data analysis, project management and systems thinking so they can help create and implement solutions to address the needs of developing communities worldwide.

For more information, visit the Graduate School's Engineering for Developing Communities (<http://www.colorado.edu/graduateschool/masters-programs/engineering-developing-communities>) webpage.

Distance Education

Students can take individual courses toward a master's degree through distance education (online). For more information, connect with the graduate program advisor or visit CU Boulder Connect's Master's Programs (<http://www.colorado.edu/graduateschool/admissions/distance-education/masters-programs>) webpage.

Requirements

Course Requirements

The following course requirements are subject to change; for the most current information, visit the department's Water Engineering & Management webpage or the Graduate School's Engineering for Developing Communities webpage.

The professional master's degree requires a total of 30 credit hours, at least 24 of which must be completed at the 5000-level or above. At least 18 credit hours must be from course work in CVEN.

Areas of Emphasis

Water Engineering & Management Emphasis

This emphasis requires at least 30 credit hours from the following categories.

Environmental Engineering Core Courses

12

CVEN 5464	Environmental Engineering Processes
CVEN 5404	Water Chemistry
CVEN 5484	Applied Microbiology and Toxicology

One of:

CVEN 5524	Drinking Water Treatment
CVEN 5534	Wastewater Treatment
CVEN 5474	Hazardous and Industrial Waste Management

WEM Core Courses

6-9

CVEN 5564	Water Profession: Leadership & Communication
CVEN 5574	Water Utility Management: Current Issues and Future Challenges
CVEN 5584	Water Profession: Financial and Management

Electives	10-12
Civil engineering electives (3-9 credits).	
Public affairs (CU Denver) electives (0-3 credits).	
Additional courses to fulfill 30-credit minimum, if necessary.	
Master's Report and Seminar	2
Total Credit Hours	30-35

Engineering for Developing Communities Emphasis

This emphasis requires at least 30 credit hours distributed as follows.

Required Core Courses

CVEN 5919	Sustainable Community Development 1	3
CVEN 5929	Sustainable Community Development 2	3
CVEN 5939	Sustainable Community Development Field Practicum	3
ATLS 5250	Fieldwork Methods for ICTD Practitioners	3

Required Competency Areas

Select one 3-credit course from each competency area: 9

Data Analysis

Systems Thinking

Project Management

Option Area

Select 9 credits of elective courses in a coherent topic area, selected in conjunction with the student's faculty advisor. Possibilities include: 9

Energy

Environmental Health

Construction

Engineering Management Certificate

Policy Issues

Total Credit Hours 30

Time Limit

All degree requirements must be completed within four years of the date of commencing course work.

Civil Engineering - Doctor of Philosophy (PhD)

Students typically complete their PhD in civil, environmental, and architectural engineering within 4 to 6 years, depending on whether they enter the program with a master's degree. It is possible for highly qualified students to enter the PhD program directly without a master's degree.

The primary focus of a PhD student is to perform novel research and support their faculty advisor. At the time of admission, PhD students must have a faculty advisor who agrees to accept the student into their research program and mentor their academic progress. PhD students are supported through research and teaching assistantships and are also encouraged to apply for their own sources of funding.

For more information, visit the department's Graduate Studies (<http://www.colorado.edu/ceae/prospective-students/graduate-studies>) webpage.

Requirements

The PhD requires 30 semester hours of course work, plus 30 hours of dissertation credit. PhD students are also required to successfully complete a preliminary exam, a comprehensive exam and a final dissertation defense.

Preliminary Examination

Each doctoral student shall take a preliminary examination as determined by the faculty of the specialty area in which the student is enrolled, normally not later than 12 months from the time the student is first enrolled in the doctoral program. The student must pass this examination in order to continue in the doctoral program.

Comprehensive Examination

The comprehensive examination shall consist of a written and an oral examination. The exam may not be attempted until the student's last semester of formal course work. At the comprehensive examination, the student shall present a plan for the dissertation research to the advisory committee for approval. Failure to pass the comprehensive examination may be remedied by repeating the examination after an interval of not less than four months.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Engineering for Developing Communities - Graduate Certificate

The Mortenson Center in Engineering for Developing Communities trains engineers to work in partnership with people from developing communities worldwide to create sustainable solutions to meet their basic needs.

Distance Education

Students can complete some requirements for this graduate certificate via distance education (online). For more information, visit the Mortenson Center (<http://www.colorado.edu/mcedc>) website.

The Mortenson Center in Engineering for Developing Communities (<http://www.colorado.edu/mcedc>) (MCEDC) offers a graduate certificate in Engineering for Developing Communities to degree-seeking graduate-level engineering students (including BS/MS students in their final year, MS, or PhD students) enrolled in a department within the College of Engineering and Applied Science. It is primarily designed for students who want to learn about global development or who have an interest in possibly pursuing a career in the fields of community development or humanitarian engineering. Students earn the certificate by satisfactorily completing the four required courses listed below, with a grade of B- or higher in each course:

CVEN 5919	Sustainable Community Development 1	3
CVEN 5929	Sustainable Community Development 2	3

CVEN 5939	Sustainable Community Development Field Practicum	3
ATLS 5250	Fieldwork Methods for ICTD Practitioners	3

The EDC Graduate Certificate requirements are separate from the graduate degree requirements established by each student's home department. Therefore, graduate students interested in completing the EDC Graduate Certificate need to contact their respective academic advisors to determine how the certificate courses will fit into their overall degree plan.

Computer Science

The CU Boulder graduate computer science program is one of the top-ranked programs in the *U.S. News & World Report* ranking of public universities. As a student, you will receive a strong education and conduct groundbreaking tier-one research. We have 40+ faculty members conducting fundamental and applied research in artificial intelligence, robotics, computational biology, human centered computing, numerical & scientific computing, programming languages, software engineering, systems and networking, and theory of computing.

Boulder is also home to research and development operations for many large companies, and four federal research labs: the National Center for Atmospheric Research, the National Institute for Standards and Technology, the National Oceanic and Atmospheric Administration, and the National Renewable Energy Laboratory.

Recent doctoral and master's graduates accepted employment at companies including but not limited to the following: Microsoft, Apple, Google, Facebook, Twitter, Cisco, Raytheon, HP, NASA, Amazon, Sandia National Laboratories, Northrop Grumman and Seagate. Many of our graduating PhD students also enter careers in academia.

For more information, visit the Computer Science (<http://www.colorado.edu/cs>) website.

Master's Degrees

- Computer Science - Master of Science (MS) (p. 1225)
- Computer Science - Professional Master of Science (MSCPS) (p. 1225)
- Computer Science - Master of Engineering (ME) (p. 1224)

Doctoral Degree

- Computer Science - Doctor of Philosophy (PhD) (p. 1226)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Kenneth M (https://experts.colorado.edu/display/fisid_113566)
Professor; PhD, University of California-Irvine

Bennett, John Knox (https://experts.colorado.edu/display/fisid_116933)
Professor; PhD, University of Washington

Black, John (https://experts.colorado.edu/display/fisid_126540)
Associate Professor; PhD, University of California-Davis

Boese, Elizabeth Sugar (https://experts.colorado.edu/display/fisid_154230)
Instructor; MS, Colorado State University

Bradley, Elizabeth (https://experts.colorado.edu/display/fisid_100546)
Professor; PhD, Massachusetts Institute of Technology

Brown, Timothy X (https://experts.colorado.edu/display/fisid_107534)
Professor; PhD, California Institute of Technology

Brubaker, Jed Richards (https://experts.colorado.edu/display/fisid_156193)
Assistant Professor; PhD, University of California-Irvine

Byrd, Richard H.
Professor Emeritus; PhD, Rice University

Cai, Xiao-Chuan (https://experts.colorado.edu/display/fisid_100636)
Professor; PhD, New York University

Cerny, Pavol (https://experts.colorado.edu/display/fisid_151749)
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan (https://experts.colorado.edu/display/fisid_146087)
Assistant Professor; PhD, University of California-Berkeley

Chen, Lijun (https://experts.colorado.edu/display/fisid_149472)
Assistant Professor; PhD, California Institute of Technology

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)
Assistant Professor; PhD, University of New Mexico

Colunga, Eliana (https://experts.colorado.edu/display/fisid_129477)
Associate Professor; PhD, Indiana University Bloomington

Correll, Nicolaus J (https://experts.colorado.edu/display/fisid_147555)
Assistant Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Dowell-Deen, Robin DeAnne (https://experts.colorado.edu/display/fisid_147779)
Assistant Professor; DSc, Washington University

Ehrenfeucht, Andrzej
Professor Emeritus

Eisenberg, Michael A (https://experts.colorado.edu/display/fisid_100427)
Professor; PhD, Massachusetts Institute of Technology

Ellis, Clarence A.
Professor Emeritus

Fischer, Gerhard
Professor Emeritus; PhD, University of Hamburg

Fosdick, Lloyd D.
Professor Emeritus

Frew, Eric W (https://experts.colorado.edu/display/fisid_134685)
Associate Professor; PhD, Stanford University

Frongillo, Rafael M (https://experts.colorado.edu/display/fisid_156416)
Assistant Professor; PhD, University of California-Berkeley

- Gabow, Harold
Professor Emeritus; PhD, Stanford University
- Gross, Mark D (https://experts.colorado.edu/display/fisid_100095)
Professor; PhD, Massachusetts Institute of Technology
- Grunwald, Dirk C (https://experts.colorado.edu/display/fisid_102261)
Professor; PhD, University of Illinois at Urbana-Champaign
- Ha, Sangtae (https://experts.colorado.edu/display/fisid_153246)
Assistant Professor; PhD, North Carolina State University at Raleigh
- Hall, David Matthew (https://experts.colorado.edu/display/fisid_147474)
Asst Research Professor
- Hammer, Matthew A (https://experts.colorado.edu/display/fisid_156066)
Assistant Professor; PhD, University of Chicago
- Han, Richard Yehwei (https://experts.colorado.edu/display/fisid_122947)
Associate Professor; PhD, University of California-Berkeley
- Hoenigman, Rhonda Olcott (https://experts.colorado.edu/display/fisid_152997)
Instructor; PhD, University of Colorado Boulder
- Hunter, Lawrence E (https://experts.colorado.edu/display/fisid_143568)
Professor
- Jansen, Kenneth E (https://experts.colorado.edu/display/fisid_147360)
Professor; PhD, Stanford University
- Jessup, Elizabeth R (https://experts.colorado.edu/display/fisid_102065)
Professor; PhD, Yale University
- Kallen-Brown, Jedediah A (https://experts.colorado.edu/display/fisid_153965)
Assistant Professor; DSc, ETH Zurich (Switzerland)
- Kane, Shaun Kevin (https://experts.colorado.edu/display/fisid_154603)
Assistant Professor; PhD, University of Washington
- Keegan, Brian (https://experts.colorado.edu/display/fisid_158122)
Assistant Professor; PhD, Northwestern University
- Keller, Eric Robert (https://experts.colorado.edu/display/fisid_151647)
Assistant Professor; PhD, Princeton University
- Ketelsen, Christian W (https://experts.colorado.edu/display/fisid_147863)
Instructor; PhD, University of Colorado Boulder
- King, Roger A.
Professor Emeritus
- Knox, David Allen (https://experts.colorado.edu/display/fisid_158054)
Instructor; PhD, University of Colorado Health Sciences Center
- Lewis, Clayton H (https://experts.colorado.edu/display/fisid_100307)
Professor; PhD, University of Michigan Ann Arbor
- Lv, Qin (https://experts.colorado.edu/display/fisid_145832)
Associate Professor; PhD, Princeton University
- Main, Michael G.
Professor Emeritus; PhD, Washington State University
- Martin, James H (https://experts.colorado.edu/display/fisid_100495)
Professor; PhD, University of California-Berkeley
- McBryan, Oliver
Professor Emeritus
- Mishra, Shivakant (https://experts.colorado.edu/display/fisid_118376)
Professor; PhD, University of Arizona
- Mozer, Michael C (https://experts.colorado.edu/display/fisid_105922)
Professor; PhD, University of California-San Diego
- Nutt, Gary J.
Professor Emeritus
- Palen, Leysia A (https://experts.colorado.edu/display/fisid_114604)
Professor; PhD, University of California-Irvine
- Palmer, Martha (https://experts.colorado.edu/display/fisid_138162)
Professor; PhD, Univ of Edinburgh (Scotland)
- Paul, Michael J (https://experts.colorado.edu/display/fisid_156070)
Assistant Professor; PhD, Johns Hopkins University
- Repenning, Alexander (https://experts.colorado.edu/display/fisid_104946)
Research Professor; PhD, University of Colorado Boulder
- Sanders, Bruce W.
Professor Emeritus
- Sankaranarayanan, Sriram (https://experts.colorado.edu/display/fisid_147413)
Associate Professor; PhD, Stanford University
- Schnabel, Robert B.
Professor Emeritus
- Schreuder, Willem A (https://experts.colorado.edu/display/fisid_143834)
Asst Professor Adjunct
- Shapiro, Ryan Benjamin (https://experts.colorado.edu/display/fisid_156418)
Assistant Professor; PhD, Northwestern University
- Sibley, Gabriel T (https://experts.colorado.edu/display/fisid_154632)
Assistant Professor; PhD, University of Southern California
- Sicker, Douglas C. (https://experts.colorado.edu/display/fisid_123114)
Professor; PhD, University of Pittsburgh
- Sumner, Tammy R (https://experts.colorado.edu/display/fisid_105742)
Professor; PhD, University of Colorado Boulder
- Szafir, Daniel James (https://experts.colorado.edu/display/fisid_156420)
Assistant Professor; PhD, University of Wisconsin-Madison
- Szafir, Danielle N (https://experts.colorado.edu/display/fisid_156317)
Assistant Professor; PhD, University of Wisconsin-Madison
- Tufo, Henry (https://experts.colorado.edu/display/fisid_127040)
Research Professor; PhD, Brown University
- Voida, Amy Kathryn Mitchell (https://experts.colorado.edu/display/fisid_155855)
Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A (https://experts.colorado.edu/display/fisid_155856)
Assistant Professor; PhD, Georgia Institute of Technology

Waite, William M.
Professor Emeritus

Ward, Wayne Hinson (https://experts.colorado.edu/display/fisid_114680)
Research Professor; PhD, University of Colorado Boulder

Winklmann, Karl A.
Professor Emeritus

Wustrow, Eric A. (https://experts.colorado.edu/display/fisid_156419)
Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Pei Hsiu (https://experts.colorado.edu/display/fisid_151584)
Assistant Professor; PhD, Massachusetts Institute of Technology

Ying, Jordan Boyd-Graber (https://experts.colorado.edu/display/fisid_154406)
Assistant Professor; PhD, Princeton University

Courses

CSCI 5135 (3) Computer-Aided Verification

Covers two-level and multilevel minimization, optimization via expert systems, algebraic and Boolean decomposition, layout methodologies, state assignment, encoding and minimization, silicon compilation.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5139

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites ECEN 2703 and general proficiency in discrete mathematics and programming.

Additional Information: Departmental Category: Programming Languages

CSCI 5229 (3) Computer Graphics

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4229

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5239 (3) Advanced Computer Graphics

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4239

Requisites: Requires prerequisite course of CSCI 5229 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5250 (3) Computer Science: The Canon

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count toward breadth requirement for Computer Science MS/ME degree.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4250

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5253 (3) Datacenter Scale Computing - Methods, Systems and Techniques

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4253

Requisites: Restricted to graduate student Computer Sciences (CSEN) students only.

Recommended: Prerequisite CSCI 5273.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5254 (3) Convex Optimization and Its Applications

Discuss basic convex analysis (convex sets, functions and optimization problems), optimization theory (linear, quadratic, semidefinite and geometric programming; optimality conditions and duality theory), some optimization algorithms (descent methods and interior-point methods), basic applications (in signal processing, control, communications, networks, statistics, machine learning, circuit design and mechanical engineering, etc.), and some advanced topics (distributed decomposition, exact convex relaxation, parsimonious recovery).

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5273 (3) Network Systems

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4273 and ECEN 5273

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5302 (3) Advanced Robotics

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4302

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 3302 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5314 (3) Algorithms for Molecular Biology

Surveys molecular biology and combinatorial algorithms used to understand DNA, RNA, and proteins. Students work in groups to define and tackle meaningful biological problems and learn to collaborate effectively with scientists in other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4314

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5340 (3) Startup Essentials: Entrepreneurial Projects in Computing

Provides students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept and be evaluated on product/market fit. CS coding concepts relevant for startups, including potentially cloud programming, mobile programming and agile software engineering, will be taught. Does not satisfy breadth requirement.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4348

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5350 (3) Entrepreneurial Projects II

Follows CSCI 5340. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept. Does not satisfy breadth requirement.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4358

Requisites: Requires a prerequisite course of CSCI 5340 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5352 (3) Network Analysis and Modeling

Examines modern techniques for analyzing and modeling the structure and dynamics of complex networks. Focuses on statistical algorithms and methods, and emphasizes model interpretability and understanding the processes that generate real data. Applications are drawn from computational biology and computational social science. No biological or social science training is required.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 3104 and APPM 3570.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5413 (3) Computer Security and Ethical Hacking

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4413

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5417 (3) Information Retrieval Systems

Addresses practical issues in the design, implementation and analysis of modern information retrieval systems. The major focus is on Web-based applications including ad hoc retrieval, classification, and clustering. Introduces the use of open source retrieval systems, standard evaluation metrics and gold-standard evaluation collections.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Database Systems

CSCI 5444 (3) Introduction to Theory of Computation

Reviews regular expressions and finite automata. Studies Turing machines and equivalent models of computation, the Chomsky hierarchy, context-free grammars, push-down automata, and computability.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5446 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4446 and ECEN 4423 and ECEN 5423

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5448 (3) Object-Oriented Analysis and Design

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4448

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Software Engineering

CSCI 5454 (3) Design and Analysis of Algorithms

Techniques for algorithm design, analysis of correctness and efficiency; divide and conquer, dynamic programming, probabilistic methods, advanced data structures, graph algorithms, etc. Lower bounds, NP-completeness, intractability.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 2270 or equivalent.

Additional Information: Departmental Category: Theory of Computation

CSCI 5502 (3) Data Mining

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4502

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5525 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students will build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4555 and ECEN 4553 and ECEN 5523

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 3155 and CSCI 2400 or ECEN 3350.

Additional Information: Departmental Category: Programming Languages

CSCI 5535 (3) Fundamental Concepts of Programming Languages

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5533

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 3155 or instructor consent required.

Additional Information: Departmental Category: Programming Languages

CSCI 5548 (3) Software Engineering of Standalone Programs

Applies engineering principles to phases of software product development, project planning, requirements definition, design, implementation, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections and modeling. Includes relation to RTS and object-oriented programming.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5543

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 1300 and CSCI 2270 or instructor consent required.

Additional Information: Departmental Category: Software Engineering

CSCI 5551 (3) Parallel Processing

Examines a range of topics involved in using parallel operations to improve computational performance. Discusses parallel architectures, parallel algorithms and parallel programming languages. Architectures covered include vector computers, multiprocessors, network computers and data flow machines.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5553

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite background in computer organization, introduction to programming languages, elementary numerical analysis, or instructor consent required.

Additional Information: Departmental Category: Parallel Processing

CSCI 5573 (3) Advanced Operating Systems

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5573

Requisites: Requires prerequisite course of CSCI 2400 and CSCI 3753 (all minimum grade C). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5576 (4) High-Performance Scientific Computing

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4576

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5593 (3) Advanced Computer Architecture

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a machine and the design of cache memory systems. Also studies current and historically important computer architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5593

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 4593 or instructor consent required.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5606 (3) Principles of Numerical Computation

Highlights computer arithmetic, solution of linear systems, least-squares approximations, nonlinear algebraic equations, interpolation, and quadrature.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 3656 and three semesters of calculus or equivalent.

Additional Information: Departmental Category: Numerical Computation

CSCI 5608 (3) Software Project Management

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5603 and EMEN 5031

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites ECEN 4583 and CSCI 5548 and CSCI 4318 or equivalent industrial experience.

Additional Information: Departmental Category: Software Engineering

CSCI 5622 (3) Machine Learning

Trains students to build computer systems that learn from experience. Includes the three main subfields: supervised learning, reinforcement learning and unsupervised learning. Emphasizes practical and theoretical understanding of the most widely used algorithms (neural networks, decision trees, support vector machines, Q-learning). Covers connections to data mining and statistical modeling. A strong foundation in probability, statistics, multivariate calculus, and linear algebra is highly recommended.

Requisites: Requires prerequisite courses of CSCI 2400 and CSCI 3104 (all minimum grade C). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5636 (3) Numerical Solution of Partial Differential Equations

Focuses on parallel algorithms for partial differential equations, iterative solvers such as Krylov subspace methods, domain decomposition and multilevel methods.

Requisites: Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5646 (3) Numerical Linear Algebra

Offers direct and iterative solutions of linear systems. Also covers eigen value and eigenvector calculations, error analysis, and reduction by orthogonal transformation. A sound knowledge of basic linear algebra, experience with numerical computation, and programming experience is required.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5654 (3) Linear Programming

Presents algorithms, simplex and modifications. Examines theory-duality and complementary slackness. Involves network flow algorithms. Introduces integer programming.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite linear algebra.

Additional Information: Departmental Category: Theory of Computation

CSCI 5673 (3) Distributed Systems

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5673

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 5573 or a course in computer networks.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5676 (3) Numerical Optimization

Focuses on computational methods for solution of unconstrained and some constrained optimization problems, nonlinear least-squares problems and systems of nonlinear equations. Formerly CSCI 6676.

Requisites: Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5714 (3) Formal Languages

Explores context-free languages: pumping lemma and variants, closure properties, and decision properties. Involves parsing algorithms, including general and special languages, e.g., LR. Additional topics chosen by instructor.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 5444 or instructor consent required.

Additional Information: Departmental Category: Theory of Computation

CSCI 5722 (3) Computer Vision

Explores algorithms that can extract information about the world from images or sequences of images. Topics covered include: imaging models and camera calibration, early vision (filters, edges, texture, stereo, optical flow), mid-level vision (segmentation, tracking), vision-based control and object recognition.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite probability, multivariate calculus and linear algebra.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5753 (3) Computer Performance Modeling

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4753 and ECEN 4753 and ECEN 5753

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5802 (1) Data Science Team Companion Course

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4802

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4809 and ATLS 4809 and ATLS 5809

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5817 (3) Database Systems

Provides an advanced treatment of basic database concepts.

Requisites: Requires prerequisite course of CSCI 3287 (minimum grad C-). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 3753.

Additional Information: Departmental Category: Database Systems

CSCI 5822 (3) Probabilistic Models of Human and Machine Learning

Introduces a set of modeling techniques that have become a mainstay of modern artificial intelligence, cognitive science and machine learning research. These models provide essential tools for interpreting the statistical structure of large data sets and for explaining how intelligent agents analyze the vast amount of experience that accumulates through interactions with an unfamiliar environment.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite undergraduate course in probability and statistics.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5828 (3) Foundations of Software Engineering

Provides an introduction to software engineering concepts and techniques. Topics include the history of software engineering, fundamental software engineering principles and theory, software life cycles, software testing, and the design and implementation of concurrent and large-scale software systems.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Software Engineering

CSCI 5832 (3) Natural Language Processing

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

Equivalent - Duplicate Degree Credit Not Granted: LING 5832

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5839 (3) User-Centered Design and Development 1

Develops the skills and practices necessary to apply user-centered approaches to software requirements analysis, and the design and evaluation of computer applications.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5854 (3) Theoretical Foundations for Cyber-Physical Systems

Covers techniques for modeling, design and verification of Cyber-Physical Systems and application domains including automotive systems, robotics and medical devices. Modeling topics include timed systems, differential equations, switched systems, hybrid dynamical systems. Verification topics: reachability and stability verification. Temporal specifications. Synthesis of controllers. Applications: automotive systems, medical devices.

Requisites: Requires prerequisite course of CSCI 3434 or ECEN 3300 (minimum grade C). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5900 (1-6) Master's Level Independent Study

Provides opportunities for independent study at the master's level.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5919 (3) HCC Survey and Synthesis: Foundations and Trajectories

Examines interdisciplinary field of human-computer interaction through a comprehensive content and historical survey. Considers new trajectories of inquiry and how the field merges with others. "Social computing" is emphasized as a central topic. Students across disciplines will find the course foundational for understanding human-centered technology matters, including computer scientists; social scientists; and business and media arts students.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5922 (3) Neural Networks and Deep Learning

Introduces modern approaches to machine learning using neural networks. Neural nets, popular in the early 1990s, have undergone a resurgence due to significant advances in computing power and the availability of very large data sets. Now rechristened 'deep learning', the field has produced state-of-the-art results in a range of artificial intelligence problems, including vision, speech and natural language processing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5929 (3) HCC Survey and Synthesis: New Disciplinary Directions

Studies recent advances in human-computer interaction through critical analysis of influential papers and self-guided research. Examines new paradigms in input, output, and visualization for technology design and interaction. Considers innovative methods to assess various population design and technological needs. Studies in computer-related fields, social science, business, media arts and communications benefit learning about human-centered computing research.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 5919.

Additional Information: Departmental Category: Graphics

CSCI 6000 (1) Introduction to the Computer Science PhD Program

Instructs new Ph.D students in Computer Science how to obtain a Ph.D and how to become an effective member of the computer science research community. Makes students aware of formal requirements, educational objectives, and research themes. Provides evaluative criteria and guidelines for all objectives to be achieved.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

CSCI 6268 (3) Foundations of Computer and Network Security

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5550

Requisites: Requires prerequisite course of CSCI 5273 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Software Engineering

CSCI 6302 (3) Speech Recognition and Synthesis

Introduction to automatic speech recognition and understanding, conversational agents, dialogue systems, and speech synthesis/text-to-speech. Topics include the noisy channel model, Hidden Markov Models, A* and Viterbi decoding, language modeling (N-grams, entropy), concatenative synthesis, text normalization, dialogue and conversation modeling.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 5832 or LING 5200 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 6402 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 6454 (3) Advanced Algorithms

Topics include matching and network flows, matroids, computational geometry, parallel computation (PRAM, hypercube, mesh). Also includes Vlsi, database theory, distributed computation, cryptography, robotics, scheduling, probabilistic algorithms, approximation algorithms, average case, and amortized analysis, time permitting.

Requisites: Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Theory of Computation

CSCI 6622 (3) Advanced Machine Learning

Covers advanced theoretical and practical topics in machine learning and latest developments in the field. Students conduct original research, either applied or theoretical, and present their results.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CSCI 5622 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 6686 (3) Numerical Methods for Constrained Optimization

Covers computational methods for constrained optimization. Topics include basic theory, methods for quadratic programming, active set strategies for linear constraints, and penalty and successive quadratic programming methods for nonlinearly constrained problems.

Requisites: Requires prerequisite course of CSCI 5606 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Numerical Computation

CSCI 6800 (1-6) Master of Engineering Project

Students seeking the master of engineering degree must complete a creative investigation project, including a written report, supervised by a member of the graduate faculty. Department enforced prerequisite: completion of 21 hours towards the ME degree.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate student Computer Sciences (CSEN) students only.

Additional Information: Departmental Category: General Computer Science

CSCI 6810 (1) Seminar in Computational Biology

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4810

Additional Information: Departmental Category: General Computer Science

CSCI 6940 (1) Master's Degree Candidacy

For students who need to be registered for the purpose of taking the master's comprehensive exam and who are not otherwise registered. Credit does not count toward degree requirements.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Computer Science

CSCI 6950 (1-6) Master's Thesis

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 7000 (1-4) Current Topics in Computer Science

Covers research topics of current interest in computer science that do not fall into a standard subarea.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

CSCI 7123 (3) Topics in Operating Systems

Topics selected by instructor. Possible topics are system design, measurement and evaluation, simulation, mathematical modeling, and parallelism.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 5573 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 7135 (3) Topics in Programming Languages

Topics selected by instructor. Possible topics are syntax, semantics, metacompilers, compiler design, and translator writing systems. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Programming Languages

CSCI 7143 (3) Topics in Computer Systems

Topics selected by instructor. Possible topics are online systems, multiprocessing, microprogramming, architecture, data communications, and computing networks. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 7154 (3) Topics in Theory of Computation

Selected topics of current interest in theory of computation.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Theory of Computation

CSCI 7176 (3) Topics in Numerical Computation

Topics selected by instructor. Possible topics are numerical linear algebra, solution of differential equations, nonlinear algebra and optimization, data fitting, linear and nonlinear programming, and solution of large problems. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Numerical Computation

CSCI 7222 (3) Topics in Nonsymbolic Artificial Intelligence

Topics vary from year to year. Possible topics include human and machine vision, signal and speech processing, artificial life, mathematical foundations of connectionism, and computational learning theory.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CSCI 5622 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7412 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

Requisites: Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7422 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

Requisites: Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7717 (3) Topics in Database Systems

Studies topics such as distributed databases, database interfaces, data models, database theory, and performance measurement in depth.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 5817 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Database Systems

CSCI 7772 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7818 (3) Topics in Software Engineering

Studies selected topics of current interest in software engineering. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Software Engineering

CSCI 7900 (1-6) Doctoral Level Independent Study

For doctoral students.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

CSCI 8990 (1-10) Doctoral Dissertation

Investigates some specialized field of computer science. Approved and supervised by faculty members.

Repeatable: Repeatable for up to 30.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

Computer Science - Master of Engineering (ME)

The principle difference between the Master of Engineering and the Master of Science degrees is that the Master of Engineering degree does not require a residency on campus. It is intended to meet the needs of those practicing engineers who are working full time outside the University.

It also allows participants to pursue an integrated program of studies by specializing in one engineering discipline and selecting courses from other engineering fields and business subjects related to the individual student's professional work.

A successful program to meet these needs requires greater flexibility in operation than is normally possible or intended under the Master of Science degree program.

For more information, visit the Master of Engineering (<http://www.colorado.edu/cs/current-students/graduate-students/me-degree>) webpage.

Dual Degree Program

ME in Computer Science and Engineering Management

This program also offers a dual degree with the Engineering Management Program. For information, visit the Computer Science (ME) & Engineering Management (ME) (<http://www.colorado.edu/cs/current-students/graduate-students/me-degree/me-dual-degree-engineering-management-program>) webpage.

Requirements

Masters of Engineering in Computer Science

- 30 credit hours of course work at the 5000-level or above.
 - At least 18 credit hours (6 courses), including 3 required breadth courses, must be completed in Computer Science (see the department's Breadth Courses (<http://www.colorado.edu/cs/current-students/graduate-students/msme-breadth-requirement>) webpage).
- Up to 12 credit hours (4 courses) may be taken outside of the department with the approval of the Graduate Committee

For more information, visit the Masters of Engineering in Computer Science (<http://www.colorado.edu/cs/current-students/graduate-students/me-degree>) webpage.

Dual Masters of Engineering in Computer Science and Engineering Management

- 45 credit hours of graduate level course work.
 - 24 credit hours must be Computer Science (CSEN) courses
 - 21 credit hours must be Engineering Management (EMEN) courses.
 - Remaining 6 credit hours may be either EMEN or CSEN courses.

For more information, visit the Dual Masters of Engineering in Computer Science and Engineering Management (<http://www.colorado.edu/cs/current-students/graduate-students/me-degree/me-dual-degree-engineering-management-program>) webpage.

Computer Science - Master of Science (MS)

The traditional Master of Science degree in computer science permits graduate students the flexibility in defining specialized interdisciplinary fields that meet their professional needs. While pursuing the traditional MS degree in computer science, students may select between the thesis and non-thesis options.

The thesis option is well-suited for students pursuing a career in academia or industry with a research component. With support from the research advisor, students in this program have the option of smoothly transitioning into the PhD program. If a student plans to earn a master's degree and then immediately continue on to a PhD, they can apply directly to our PhD program. It is not necessary to earn a master's separately.

For more information, visit the Traditional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/traditional-ms-degree-requirements>) webpage.

Concurrent Degree Program

BS/MS in Computer Science

The Master of Science degree in computer science is also available to undergraduate computer science majors. For more information, visit the CSEN BS/MS Program Requirements (<http://www.colorado.edu/cs/current-students/undergraduate-students/concurrent-bsms>) webpage.

Requirements

Students must complete an approved program of study consisting of at least 30 credit hours at the 5000 level or above, at least 24 of which (including the four required breadth courses) must be completed in computer science.

Up to 6 credit hours (two courses) may be taken outside of the department with the approval of the graduate committee.

All students must earn at least a B (not a B-) or better in their breadth courses. They need to earn at least a C or better in the remaining courses, as long as their cumulative GPA is 3.0 or better.

Breadth Courses

Students must complete one course each in four of the nine different breadth areas: artificial intelligence, computational biology, human-centered computing, numerical & scientific computing, programming languages, software engineering, database systems, systems & networking and theory of computing.

For a list of breadth courses by category, visit the department's MS/ME Breadth Requirement (<http://www.colorado.edu/cs/current-students/graduate-students/msme-breadth-requirement>) webpage.

Degree Plans

Plan I: Thesis Option

The MS thesis option curriculum is designed to provide a balance between modern technological focus and disciplinary depth. Students must secure a thesis advisor for research and course guidance.

Under this option, students have to complete 24 credit hours of course work and six thesis credit hours. In addition to this, students have to make sure to fulfill other MS degree requirements as stated by the department.

Plan II: Non-Thesis Option

Under this option, students have to complete 30 credit hours of course work. In addition to this, students have to make sure to fulfill other MS degree requirements as stated by the department.

Computer Science - Professional Master of Science (MSCPS)

The professional Master of Science in computer science is a degree program that offers possibilities for a wide range of prospective students. Whether a student is a working engineer or an undergraduate considering a career in industry, we have program options to meet their needs.

For more information, visit the department's Professional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements>) webpage.

Program Tracks

While pursuing the professional MS degree in computer science, students select between two tracks.

General Track

This is a course-based track to earn a professional MS degree in computer science.

Data Science and Engineering (DSE) Track

The Department of Computer Science has embraced this degree as an ideal opportunity to expand the high-quality courses in data science and engineering we have long offered into a wide array of courses leading to a full master's degree. The goal of our professional MS program is to produce creative, workforce-ready graduates equipped with versatile engineering and data-science skills, and technical leadership.

Adding several new data science and data engineering courses to our program now enables greater options for earning a professional MS degree with a DSE track, while also offering plenty of courses to complete a full master's degree principally with a DSE focus. Students pursuing this degree will also have access to many excellent graduate-level courses offered by the Computer Science Department's highly reputed faculty in computer science, data science, data engineering, and more.

Requirements

The following course requirements are subject to change; for the most current information, visit the department's Professional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements>) webpage.

Students must complete at least 30 credit hours of course work at the 5000 level or above (10 courses). Up to 12 credit hours (4 courses) may be taken outside of the department with the approval of the graduate committee. A thesis is not required for this degree.

All students must earn at least a B (not a B-) or better in their breadth courses. They need to earn at least a C or better in the remaining courses, as long as their cumulative GPA is 3.00 or better.

Breadth Courses

Students must complete one course each in three of the nine different breadth areas: artificial intelligence, computational biology, human-centered computing, numerical & scientific computing, programming languages, software engineering, database systems, systems & networking, and theory of computing.

For a list of breadth courses by category, visit the department's MS/ME Breadth Requirement (<http://www.colorado.edu/cs/current-students/graduate-students/msme-breadth-requirement>) webpage.

Program Tracks

Data Science and Engineering (DSE) Track

Students must complete at least 18 credit hours (six courses) in computer science, including three required breadth courses (see above) and four DSE courses (below).

DSE Courses

Data Science Core Courses

Choose one course from the following: 3

CSCI 5622	Machine Learning
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CSCI 5502	Data Mining	
CSCI 5654	Linear Programming	
Data Engineering Core Courses		
Choose one course from the following:		3
CSCI 7000	Current Topics in Computer Science (Data Engineering)	
CSCI 5253	Datacenter Scale Computing - Methods, Systems and Techniques	
CSCI 5817	Database Systems	
CSCI 7000	Current Topics in Computer Science (Big Data)	
CSCI 7000	Current Topics in Computer Science (Computer Storage Systems)	
ATLS 5214	Big Data Architecture	
General Courses		
Choose two courses from the following:		6
<i>Data Science</i>		
CSCI 5352	Network Analysis and Modeling	
CSCI 7222	Topics in Nonsymbolic Artificial Intelligence (Neural Networks and Deep Learning)	
CSCI 5254	Convex Optimization and Its Applications	
CSCI 5832	Natural Language Processing	
CSCI 5676	Numerical Optimization	
CSCI 5722	Computer Vision	
<i>Data Engineering</i>		
CSCI 5576	High-Performance Scientific Computing	
CSCI 7000	Current Topics in Computer Science (HCC Big Data Computing)	
CSCI 7000	Current Topics in Computer Science (Big Data Analytics: Systems, Algorithms and Applications)	
Total Credit Hours		12

The same course may count toward both a breadth and a DSE requirement.

For more information, visit the department's Professional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements>) webpage.

General Track

Students must complete at least 18 credit hours (6 courses) in computer science, including three required breadth courses.

For more information, visit the department's Professional MS Degree Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/ms-degree/professional-ms-degree-requirements>) webpage.

Computer Science - Doctor of Philosophy (PhD)

Computer science PhD students at CU Boulder take part in cutting edge, tier-one research, learning from nationally and internationally recognized faculty.

Computer science faculty, staff and students are engaged in cutting edge research projects that address some of the most important challenges facing society today. From harnessing the power of big data to modeling

climate change to understanding the role of social media, advances in computer science today will change the world tomorrow.

The department offers opportunities in seven main research areas:

- artificial intelligence and robotics
- computational biology
- human-centered computing
- numerical and scientific computing
- programming languages and software engineering
- systems and networking
- theory of computing

The PhD program in computer science is available to students entering graduate studies for the first time as well as those who already have a master's degree. While a master's is not required to enroll, our PhD students will typically earn one on the way to a PhD.

PhD students consult with a faculty advisor throughout the duration of their degree to review their research progress and course selection.

For more information, visit the department's PhD Degree (<http://www.colorado.edu/cs/current-students/graduate-students/phd>) and Research (<http://www.colorado.edu/cs/research>) webpages.

Requirements

Course Requirements

Students must complete 30 credit hours in courses numbered 5000 or above, including five breadth and five depth courses (see the department's PhD Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/phd/requirements>) webpage for details), and 30 credit hours of dissertation credit.

A maximum of 21 credit hours of graduate course work may be transferred from another accredited institution. All courses taken for the master's degree at the 5000 level or above at CU Boulder may be applied toward the doctoral degree.

Preliminary Examination

The purpose of the area examination is to ensure that the student has sufficient depth to begin research in a selected area. Thus, the exam tests knowledge of the general area of computer science that contains the research topic, deeper specialized knowledge of the specific research area that the student will be working in, and intellectual sophistication needed to conduct research in the area.

The area examination contrasts with the comprehensive exam, which is devoted to a focused research theme. It complements the course work requirement of the preliminary exam, which is meant to build breadth in computer science in general, and general knowledge of the student's research area.

For more information, visit the department's PhD Area Exams Offered (<http://www.colorado.edu/cs/current-students/graduate-students/phd/phd-area-exams>) webpage.

Comprehensive Examination

After passing the preliminary examination, the student continues their course work and prepares a written thesis prospectus within four years of their admission to the program. When ready, the student takes an oral comprehensive examination covering their graduate course work and thesis prospectus. The oral examination is based primarily on a written

proposal for the thesis research provided by the student to committee members in advance. This examination is conducted before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School.

For more information, visit the "PhD Comprehensive Exam/Proposal" section of the department's PhD Program Requirements (<http://www.colorado.edu/cs/current-students/graduate-students/phd/requirements>) webpage.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Electrical Engineering

Areas of focus in electrical engineering include photovoltaic, wind and renewable energy systems, power electronics systems, electromagnetic theory, microwave systems, antennas, remote sensing, bioelectronics and biomedical engineering, communications and signal processing, medical imaging, optoelectronics, nanophotons and nanodevices, biophotonics, man/machine interfaces, controls theory, and complex network systems.

With a highly regarded faculty and \$12.5 million awarded in new contract and grant funding in fiscal year 2015, the Department of Electrical, Computer and Energy Engineering (<http://www.colorado.edu/ecee>) is the perfect place to take your education to the next level.

We offer several degree options tailored to both working engineers looking to advance their careers and to those looking to pursue a career in academia. Research is concentrated in six broad areas: optics, nanostructures and bioengineering; communications and signal processing; computer engineering; dynamics and controls; electromagnetics, RF and microwaves; and power electronics.

Course code for this program is ECEN.

Research Centers

Colorado Power Electronics Center (CoPEC)

Since it was founded in 1983, the power electronics group at the University of Colorado has maintained a tradition of innovative design-oriented and application-driven research. Colorado Power Electronics Center (CoPEC) activities now span the range of applications from high-efficiency milliwatt converters for portable battery-operated systems, to hundreds or thousands of watts for computer, aerospace, telecommunications, medical and automotive power conversion, to hundreds of kilowatts for wind generation systems.

Our current research activities include projects in high-efficiency, high-power converter technology, power electronics for portable, battery-operated systems, converter modeling and computer-aided analysis, low harmonic rectifier technology for single-phase and three-phase applications and advanced control techniques and their mixed-signal ASIC implementation. We collaborate with other research groups at the University of Colorado, including those in machines and power systems,

microelectronics packaging, EMI, control and semiconductor devices. For more information, call 303-492-7327 or visit the CoPEC (<http://ecee.colorado.edu/copec>) website.

The University of Colorado Center for Environmental Technology (CET)

Understanding and managing the environment—whether for agriculture, health, water resources, disaster mitigation, energy generation, transportation, weather forecasting, climate modeling or biodiversity—requires accurate knowledge of many variables on a wide range of time and space scales. Measurements for environmental purposes are made either using in situ or remote sensors, and rely upon a variety of different means, including acoustic and electromagnetic waves, point measurements and wide-area imaging and active and passive systems. A variety of different types of platforms can be used for environmental observation, including ships and submersibles, aircraft (both manned and unmanned), spacecraft and stationary sites.

Research and educational activities at the CU Center for Environmental Technology are focused on developing sensors, systems of sensors and associated hardware and algorithms for environmental observation with a focus on new remote and in situ techniques to meet contemporary scientific and applications goals. This is accomplished by direct involvement of CU faculty, CET engineering staff and undergraduate and graduate students on the development of sensing systems to meet the observational needs of a number of government and industry sponsors. CET training involves close interaction between students and experienced professional engineers, practicing scientists and CU faculty.

The CET was established in 2006 with a major donation of equipment from the NOAA Earth System Research Laboratory, and has members, associates and students from within the broad earth science and engineering communities of Colorado. For more information, contact the CET director at 303-492-9688 or visit the Center for Environmental Technology (<http://cet.colorado.edu>) website.

Research and Instructional Equipment

The department's special equipment and facilities include a class 1000 clean room facility for epitaxial growth and fabrication of microwave and optical devices; an anechoic chamber; high-vacuum and vacuum deposition equipment for thin-films research; an integrated circuits laboratory; ion implantation equipment; crystal growing facilities; a modern systems laboratory; a laboratory for data storage research; a digital system design laboratory; a power electronics research laboratory; undergraduate laboratories in circuits, electronics; power electronics; digital signal processing and communications; embedded systems; microwaves; a holography and optics laboratory; an advanced optical metrology lab; numerous special purpose computers; a computer system development laboratory; a roof-mounted antenna range; a special microscope for laser manipulation of microorganisms in vivo; a bio-microwave laboratory; a solar power lab; photovoltaic device fabrication and characterization facilities; and bioelectronics fabrication and integration capabilities.

The Colorado Nanofabrication Laboratory (CNL) is an open user facility at the University of Colorado Boulder campus. Our mission is to provide expertise, facilities, infrastructure and teaming environments to enable and facilitate interdisciplinary research in microelectronics, optoelectronics and MEMS.

The Department of Electrical, Computer and Energy Engineering has a large variety of computing equipment to support its research and

instructional activities. In addition to specialized computing equipment, this includes several hundred PCs, Macs, a department server and a student server. These machines are connected to the campuswide ethernet network.

Master's Degrees

- Electrical Engineering - Master of Science (MS) (p. 1240)
- Electrical Engineering - Professional Master of Science (MSEE) (p. 1241)
- Electrical Engineering - Master of Engineering (ME) (p. 1240)

Doctoral Degree

- Electrical Engineering - Doctor of Philosophy (PhD) (p. 1243)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Afridi, Khurram (https://experts.colorado.edu/display/fisid_153814)
Assistant Professor; PhD, Massachusetts Institute of Technology

Akos, Dennis M. (https://experts.colorado.edu/display/fisid_131119)
Associate Professor; PhD, Ohio University

Anderson, Dana Z (https://experts.colorado.edu/display/fisid_102371)
Professor; PhD, University of Arizona

Avery, James
Professor Emeritus

Barnes, Frank S.
Professor Emeritus

Barton, Taylor Wallis (https://experts.colorado.edu/display/fisid_157939)
Assistant Professor; DSc, Massachusetts Institute of Technology

Becker, Stephen R (https://experts.colorado.edu/display/fisid_154263)
Assistant Professor; PhD, California Institute of Technology

Bennett, John Knox (https://experts.colorado.edu/display/fisid_116933)
Professor; PhD, University of Washington

Bradley, Elizabeth (https://experts.colorado.edu/display/fisid_100546)
Professor; PhD, Massachusetts Institute of Technology

Bright, Victor Mark (https://experts.colorado.edu/display/fisid_112696)
Professor; PhD, Georgia Institute of Technology

Brown, Timothy X (https://experts.colorado.edu/display/fisid_107534)
Professor; PhD, California Institute of Technology

Cathey, W. Thomas
Professor Emeritus

Cerny, Pavol (https://experts.colorado.edu/display/fisid_151749)
Assistant Professor; PhD, University of Pennsylvania

Chang, Bor-Yuh Evan (https://experts.colorado.edu/display/fisid_146087)
Assistant Professor; PhD, University of California-Berkeley

Clauset, Aaron Julian (https://experts.colorado.edu/display/fisid_147554)

Assistant Professor; PhD, University of New Mexico

Cogswell, Carol (https://experts.colorado.edu/display/fisid_141919)

Research Professor; MArch, University of Oregon

Correll, Nicolaus J (https://experts.colorado.edu/display/fisid_147555)

Assistant Professor; PhD, Ecole Polytech Federale de Lausanne (Switzerland)

Erickson, Robert W (https://experts.colorado.edu/display/fisid_105514)

Professor; PhD, California Institute of Technology

Fiez, Theresa S. (https://experts.colorado.edu/display/fisid_156578)

Professor; PhD, Oregon State University

Filipovic, Dejan S (https://experts.colorado.edu/display/fisid_126278)

ProfessorAssociate Professor; PhD, University of Michigan Ann Arbor

Forbes, Jeffrey M (https://experts.colorado.edu/display/fisid_100264)

Professor; PhD, Harvard University

Fuchs, Ewald F.

Professor Emeritus

Gasiewski, Albin J. (https://experts.colorado.edu/display/fisid_142882)

Professor; PhD, Massachusetts Institute of Technology

Gopinath, Juliet T (https://experts.colorado.edu/display/fisid_147075)

Assistant Professor; PhD, Massachusetts Institute of Technology

Grunwald, Dirk C (https://experts.colorado.edu/display/fisid_102261)

Professor; PhD, University of Illinois at Urbana-Champaign

Hachtel, Gary D.

Professor Emeritus

Hauser, John (https://experts.colorado.edu/display/fisid_102555)

Associate Professor; PhD, University of California-Berkeley

Hayes, Russell

Professor Emeritus

Herzfeld, Ute C (https://experts.colorado.edu/display/fisid_106575)

Assoc Research Professor

Heuring, Vincent P.

Professor Emeritus

Hughes, Shannon M. (https://experts.colorado.edu/display/fisid_146574)

Asst Professor Adjunct; PhD, Princeton University

Jeong, Jaewoong (https://experts.colorado.edu/display/fisid_155543)

Assistant Professor; PhD, Stanford University

Kapteyn, Henry C (https://experts.colorado.edu/display/fisid_115334)

Professor; PhD, University of California-Berkeley

Keller, Eric Robert (https://experts.colorado.edu/display/fisid_151647)

Assistant Professor; PhD, Princeton University

Kuester, Edward F (https://experts.colorado.edu/display/fisid_102489)

Professor; PhD, University of Colorado Boulder

Le, Hanh-Phuc (https://experts.colorado.edu/display/fisid_156223)

Assistant Professor; PhD, University of California-Berkeley

Libertun, Ariel Ruben (https://experts.colorado.edu/display/fisid_140697)

Asst Professor Adjunct

Lightner, Michael R (https://experts.colorado.edu/display/fisid_101723)

Professor; PhD, Carnegie Mellon University

Liu, Youjian (https://experts.colorado.edu/display/fisid_126283)

Associate Professor; PhD, Ohio State University

Majerfeld, Arnaldo

Professor Emeritus

Maksimovic, Dragan (https://experts.colorado.edu/display/fisid_105609)

Professor; PhD, California Institute of Technology

Marden, Jason R. (https://experts.colorado.edu/display/fisid_147582)

Associate Professor; PhD, University of California-Los Angeles

Mathys, Peter (https://experts.colorado.edu/display/fisid_100084)

Associate Professor; PhD, Swiss Federal Instit of Tech, Zurich (Switzerland)

McLeod, Robert R (https://experts.colorado.edu/display/fisid_107547)

Professor; PhD, University of Colorado Boulder

Meyer, Francois Georges (https://experts.colorado.edu/display/fisid_115559)

Professor; PhD, INRIA (France)

Mickelson, Alan R (https://experts.colorado.edu/display/fisid_100286)

Associate Professor; PhD, California Institute of Technology

Moddel, Garret (https://experts.colorado.edu/display/fisid_105440)

Professor; PhD, Harvard University

Murnane, Margaret (https://experts.colorado.edu/display/fisid_115333)

Distinguished Professor; PhD, University of California-Berkeley

Palo, Scott E (https://experts.colorado.edu/display/fisid_109033)

Professor; PhD, University of Colorado Boulder

Pao, Lucy Y (https://experts.colorado.edu/display/fisid_107151)

Professor; PhD, Stanford University

Park, Wounjhang (https://experts.colorado.edu/display/fisid_122676)

ProfessorAssociate Professor; PhD, Georgia Institute of Technology

Piestun, Rafael (https://experts.colorado.edu/display/fisid_118538)

Professor; PhD, Israel Instit of Tech (Israel)

Piket-May, Melinda J (https://experts.colorado.edu/display/fisid_102097)

Associate ProfessorAssoc Professor Attendant Rank; PhD, Northwestern University

Pleszkun, Andrew R (https://experts.colorado.edu/display/fisid_102250)

Associate Professor; PhD, University of Illinois at Urbana-Champaign

Popovic, Zorana (https://experts.colorado.edu/display/fisid_101494)

Distinguished Professor; PhD, California Institute of Technology

Ruben, Shalom D (https://experts.colorado.edu/display/fisid_149492)

Instructor; PhD, University of California-Los Angeles

Sankaranarayanan, Sriram (https://experts.colorado.edu/display/fisid_147413)

Associate Professor; PhD, Stanford University

Schibli, Thomas Richard (https://experts.colorado.edu/display/fisid_143464)

Associate Professor; PhD, Univ of Karlsruhe (Germany)

Shaheen, Sean Eric (https://experts.colorado.edu/display/fisid_153664)

Associate Professor; PhD, University of Arizona

Shang, Li (https://experts.colorado.edu/display/fisid_145412)

Associate Professor; PhD, Princeton University

Siek, Jeremy G (https://experts.colorado.edu/display/fisid_143687)

Asst Professor Adjunct; PhD, Indiana University Bloomington

Siewert, Sam (https://experts.colorado.edu/display/fisid_105591)

Asst Professor Adjunct

Smalyukh, Ivan I (https://experts.colorado.edu/display/fisid_144757)

Associate Professor; PhD, Kent State University

Somenzi, Fabio (https://experts.colorado.edu/display/fisid_103969)

Professor; PhD, Politecnico Di Torino (Italy)

Thayer, Jeffrey P (https://experts.colorado.edu/display/fisid_134469)

Professor; PhD, University of Michigan Ann Arbor

Touri, Behrouz (https://experts.colorado.edu/display/fisid_154604)

Assistant Professor; PhD, University of Illinois at Urbana-Champaign

Van Zeghbroeck, Bart J (https://experts.colorado.edu/display/fisid_104113)

Professor; PhD, University of Colorado Boulder

Varanasi, Mahesh K (https://experts.colorado.edu/display/fisid_103090)

Professor; PhD, Rice University

Wachtel, Howard

Professor Emeritus

Wagner, Kelvin (https://experts.colorado.edu/display/fisid_105344)

Professor; PhD, California Institute of Technology

Waite, William M.

Professor Emeritus

Wustrow, Eric A. (https://experts.colorado.edu/display/fisid_156419)

Assistant Professor; BE, University of Michigan Ann Arbor

Yeh, Pei Hsiu (https://experts.colorado.edu/display/fisid_151584)

Assistant Professor; PhD, Massachusetts Institute of Technology

Zabotin, Nikolay (https://experts.colorado.edu/display/fisid_127038)

Research Professor

Zane, Regan A (https://experts.colorado.edu/display/fisid_109504)

Associate Professor; PhD, University of Colorado Boulder

Courses

ECEN 5000 (3) Graduate Professional Seminar

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

ECEN 5005 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5008 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5009 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5011 (1-4) Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4011

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Bioengineering

ECEN 5012 (3) Special Topics

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5013 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering

(EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

ECEN 5016 (1-4) Special Topics

Additional Information: Departmental Category: Optics

ECEN 5018 (1-4) Special Topics

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5021 (1-4) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students in Electrical Engineering

(EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Bioengineering

ECEN 5023 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering, Embedded Systems.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5024 (1-4) Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4024

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5028 (1-4) Special Topics

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5032 (3) Special Topics

Additional Information: Departmental Category: Bioengineering

ECEN 5049 (1-4) Special Topics

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5053 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering - Embedded Engineering.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4053

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5104 (3) Computer-Aided Microwave Circuit Design

Emphasizes the design of strip-line and microstrip circuits, using a CAD package. Discusses design of impedance transformers, amplifiers, switches, phase-shifters, etc. Assignments include design of typical circuits and their analysis using a microwave circuit analysis program. Laboratory includes measurements using a network analyzer facility on a typical circuit designed and fabricated by students.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5107 (3) Electric Power Grid

Examines the electrical grid, including conventional generation, transmission/ distribution, and new renewable generation technologies. Issues including grid stability, the increase in variable generation on the grid, and how the electrical grid will change in the future will be addressed. Intended for students with an engineering background from outside electrical engineering who desire an introduction to the power grid.

Requisites: Excludes graduate students in Electrical Engineering or Electrical Engineering Concurrent degree plans.

Additional Information: Departmental Category: Power

ECEN 5114 (3) Waveguides and Transmission Lines

Intermediate course dealing with guided-wave systems at HF, microwave, and optical frequencies. Modern waveguiding structures, including circular metallic waveguides, microstrip transmission lines, and optical waveguides are treated. Additional material may include waveguide losses, excitation of waveguides, microwave network theory, coupled-mode theory, resonators, and pulse propagation in waveguides.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5120 (3) Neural Network Design

Introduces basic (artificial) neural network architectures and learning rules. Emphasizes mathematical analysis of these networks, methods of training them and application to practical problems such as pattern recognition, signal processing and control systems. Shows how to construct a network of "neurons" and train them to serve a useful function.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4120

Additional Information: Departmental Category: General

ECEN 5122 (3) Wireless Local Area Networks

Examines small-scale wireless networks particularly personal and local area networks. Covers licensed and unlicensed spectrum, indoor and small-scale radio propagation, modulation techniques, network topologies, ad hoc and infrastructure networks, protocol design, TCP/IP-wireless interactions and protocol standards.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5520

Requisites: Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

Recommended: Prerequisite TLEN 5430.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5128 (3) Game Theory and Multiagent Systems

Provides an overview of game theory with a special emphasis on its application to multiagent systems, i.e., systems that are comprised of a collection of interacting and possibly competing decision making entities. Examples drawn from engineered, economics and social models, including multivehicle robotics, data networks, sensor networks and electronic commerce.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5134 (3) Electromagnetic Radiation and Antennas

Covers elementary sources and antennas, cylindrical wire antennas, loop antennas, radiation patterns and antenna gain, aperture sources such as horns and dishes, specialized antennas such as microstrip patches, linear and circular arrays, mutual coupling and ground effects, ray and numerical formulations, transmission formulas, and antenna applications.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5138 (3) Control Systems Analysis

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Topics covered in this course will be investigated in more depth, require external readings, additional homework will be assigned, and the exams will be more difficult.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4138

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3300.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5139 (3) Computer-Aided Verification

Covers theoretical and practical aspects of verification of finite-state systems (hardware) and infinite-state systems (programs). Model checking: temporal logics, explicit-state and symbolic search, BDDs. Constraint solvers: SAT solvers, decision procedures. Program verification: invariants, partial vs. total correctness, abstraction. Department enforced requisite: general proficiency in discrete mathematics and programming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5135

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite CSCI 2824.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5154 (3) Computational Electromagnetics

Provides a computational study of microwave circuits and antennas, using finite-difference, finite-element, and moment methods. Requires students to develop algorithms, write and execute programs, and prepare reports analyzing results. Circuits include waveguides, microstrip lines, and center-fed dipole antennas.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5156 (3) Physical Optics

Covers the application of Maxwell's equations to optical wave propagation in free space and in media. Topics include polarization, dispersion, geometrical optics, interference, partial coherence, and diffraction.

Recommended: Prerequisite ECEN 3410.

Additional Information: Departmental Category: Optics

ECEN 5166 (3) Guided Wave Optics

Builds up the concepts necessary to understand guided wave optical systems. Topics include slab wave-guides, semiconductor lasers, fiber optics, and integrated optics.

Requisites: Requires prerequisite courses of ECEN 5645 and ECEN 5156 (all minimum grade C-).

Additional Information: Departmental Category: Optics

ECEN 5224 (3) High Speed Digital Design

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4224

Requisites: Requires a prereq course of ECEN 3400 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5254 (3) Remote Sensing Signals and Systems

Examines passive and active techniques for remote sensing with emphasis on fundamental noise and detection issues from radio to optical frequencies. Emphasis is placed on electromagnetic wave detection, statistical signal and noise analysis, remote sensing system architecture, and hardware for remote sensing systems. Systems studied include radiometers, radars (real and synthetic aperture), interferometers, and lidars. Applications to detection and surveillance, Earth remote sensing, astronomy, and imaging systems are covered.

Requisites: Requires prerequisite courses of ECEN 3300 and ECEN 3400. Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5264 (3) Electromagnetic Absorption, Scattering, and Propagation

Electromagnetic waves in communication, navigation, and remote sensing systems from radio to optical frequencies, including propagation in deterministic and random media. Topics include absorption and refraction by gases, discrete scattering by precipitation, clouds, and aerosols, continuous scattering by refractivity fluctuations, earth-space propagation and Faraday rotation in plasmas, and radiative transfer theory.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prereqs are ECEN 3400 and ECEN 3410.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5273 (3) Network Systems

Focusing on the design and implementation of network protocols and algorithms. Topics covered include the internet's layered protocol stack, TCP/IP, Web/HTTP, email/SMTP, DNS, Ethernet, wireless networks, secure networking. Students will learn socket-based network programming. Familiarity with C and UNIX required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4273 and CSCI 5273

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5274 (3) Radar Science and Techniques

Studies atmospheric radar fundamentals. Examines scattering by precipitation and atmospheric turbulence; long-wavelength radars and the dynamics of the middle and upper atmosphere; design of meteorological and clear-air radars; profiling tropospheric winds, temperature, and humidity by radar and radiometry; and ionospheric sounding using ionosondes and incoherent-scatter radars.

Requisites: Requires prerequisite course of ECEN 5254 (minimum grade C-).

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5322 (3) Search Engine & Analysis of High-dimensional Dataset

Provides students with an exposition of the novel algorithmic methods for searching and analyzing big data. The class includes a project: students design a content-based music information retrieval system similar to those used by Gracenote, Shazam, or Pandora.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5324 (3) Fundamentals of Microsystem Packaging

Introduction to the fundamentals of microsystems packaging. A seminar style course which surveys topics in microsystem packaging such as electrical package design, design for reliability, thermal management, multichip packaging, IC Assembly, sealing and encapsulation, and board assembly.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4324

Requisites: Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5341 (3) Bioelectromagnetics

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4341

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Bioengineering

ECEN 5345 (3) Introduction to Solid State Physics

Provides an introduction to the electronic, photonic and phononic properties of solid state materials and devices. Covers optical constants, free electron gas, plasmons, energy bands, semiconductors and doping, excitons, quantum wells, phonons and electrooptical effects. Makes use of quantum mechanical methods. Department enforced prerequisite: basic quantum mechanics.

Requisites: Restricted to any graduate student or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5355 (3) Principles of Electronic Devices 1

Relates performance and limitations of solid state devices to their structures and technology. Examines semiconductor physics and technology. Includes Pn-junction, Mos, and optoelectronic devices. For both advance circuit and device engineers.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3320.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5358 (3) Optimization and Optimal Control

Introduces the theory and practice of optimization and optimal control. Topics include basic theory, nonlinear system trajectories and regulation, function space operators and derivatives, optimality conditions, barrier functionals and Newton's method in function space.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 5448.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5375 (3) Microstructures Laboratory

Offers experience in monolithic silicon integrated circuit fabrication techniques, including Ic layout, pattern compiling and generation, mask making, oxidation, photolithography, diffusion, implantation, metallization, bonding, process analysis and testing. Includes design project.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4375

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5418 (3) Automatic Control Systems 1

Coverage of principles of control systems with Multiple Inputs and Multiple Outputs (MIMO). Topics include MIMO state-space theory, applications of the singular value decomposition (SVD), coprime factorization methods, frequency domain topics, and an introduction to H-infinity design.

Requisites: Requires prerequisite course of ECEN 5448 (minimum grade C-).

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5423 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4423 and CSCI 4446 and CSCI 5446

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5438 (3) Robot Control

Provides a comprehensive treatment of the mathematical modeling of robot mechanisms and the analysis methods used to design control laws for these mechanisms.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites PHYS 1110 and ECEN 4138 (minimum grade C-).

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5448 (3) Advanced Linear Systems

Offers a state space approach to analysis and synthesis of linear systems, state transition matrix, controllability and observability, system transformation, minimal realization, and analysis and synthesis of multi-input and multi-output systems.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5458 (3) Sampled Data and Digital Control Systems

Provides an analysis and synthesis of discrete-time systems. Studies sampling theorem and sampling process characterization, z-transform theory and z-transferfunction, and stability theory. Involves data converters (A/D and D/A), dead-beat design, and digital controller design.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5503 (3) Computer Systems Design and Architecture

Covers digital logic circuits, assembly language programming, and gate-level computer design and architecture. Also discusses computer arithmetic algorithms, I/O, peripheral device performance, networking, and the Internet. Limited to graduate students. For ECE/CS majors with nontraditional backgrounds.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5517 (3) Power Electronics and Photovoltaic Power Systems Laboratory

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4517

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5523 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4553 and CSCI 4555 and CSCI 5525

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5532 (3) Digital Signal Processing Laboratory

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4532

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5533 (3) Fundamental Concepts of Programming Languages

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5535

Requisites: Requires prerequisite course CSCI 3155 (minimum grade D-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5543 (3) Software Engineering of Standalone Programs

Applies engineering principles to phases of software product development, project planning, requirements definition, design, design patterns, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections, and modeling (primarily UML). Includes relation to embedded systems and object-oriented design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5548

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 1300 and CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5553 (3) Parallel Processing

Examines a range of topics involved in using parallel operations to improve computational performance. Discusses parallel architectures, parallel algorithms and parallel programming languages. Architectures covered include vector computers, multiprocessors, network computers and data flow machines. Department enforced prerequisite: background in computer organization, introduction to programming languages and elementary numerical analysis.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5551

Recommended: Prerequisites ECEN 4593 and CSCI 3653.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5555 (3) Principles of Energy Systems and Devices

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4555

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors) or Graduate students only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5573 (3) Advanced Operating Systems

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5573

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5583 (3) Artificial Intelligence

Surveys artificial intelligence methods, theories and applications. Studies the relationship between artificial intelligence and psychology, linguistics and philosophy. Introduces artificial intelligence programming.

Requisites: Requires prerequisite course CSCI 3245 (minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5593 (3) Advanced Computer Architecture

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a processor, out-of-order instruction issue and superscalar designs, design of cache memory systems for such systems, and architectural features required for multicore processor designs. Also studies current and historically important computer architectures.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5593

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 4593.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5603 (3) Software Project Management

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5608 and EMEN 5031

Requisites: Requires prerequisite courses ECEN 4583 and ECEN 5543 and CSCI 4318 (all minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5606 (3) Optics Laboratory

Provides advanced training in experimental optics. Consists of optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers, and holograms and experimentation of fiber optics and Fourier optics. Department enforced prerequisite: undergraduate optics course (e.g. PHYS 4510).

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5606

Additional Information: Departmental Category: Optics

ECEN 5612 (3) Random Processes for Engineers

Deals with random time-varying functions and is therefore useful in the broad range of applications where they occur. Topics include review of probability, convergence of random sequences, random vectors, minimum mean-square error estimation, basic concepts of random processes, Markov processes, Poisson processes, Gaussian processes, linear systems with random inputs, and Wiener filtering. Applications range from communications, communication networks, and signal processing to random vibration/stress analysis, mathematical finance, physics, etc.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5613 (3) Embedded System Design

Introduces system hardware and firmware design for embedded applications. Students independently design and develop a hardware platform encompassing a microcontroller and peripherals. Firmware is developed in C and assembly. A significant final project is designed, developed, documented and presented. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5616 (3) Optoelectric System Design

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4616

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Optics

ECEN 5622 (3) Information Theory and Coding

Covers fundamental limits of data compression, reliable transmission of information and information storage. Topics include information measures, typicality, entropy rates of information sources, limits and algorithms for lossless data compression, mutual information, and limits of information transmission over noisy wired and wireless links. Optional topics include lossy data compression, limits of information transmission in multiple-access and broadcast networks, and limits and algorithms for information storage.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5623 (3) Real-Time Embedded Systems

Design and build a microprocessor-based embedded system application requiring integration of sensor/actuator devices, a real-time operating system and application firmware and software. Real-time rate monotonic theory and embedded architecture are covered. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5626 (3) Active Optical Devices

Analysis of active optical devices such as semiconductor laser, detector and flat panel display by clearly defining and interconnecting the fundamental physical mechanism, device design and operating principles and device performance.

Recommended: Prerequisite ECEN 5355.

Additional Information: Departmental Category: Optics

ECEN 5632 (3) Theory and Application of Digital Filtering

Digital signal processing and its applications are of interest to a wide variety of scientists and engineers. The course covers such topics as characterization of linear discrete-time circuits by unit pulse response, transfer functions, and difference equations, use of z-transforms and Fourier analysis, discrete Fourier transform and fast algorithms (FFT), design of finite and infinite impulse response filters, frequency transformations, study of optimized filters for deterministic signals.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5633 (3) Hybrid Embedded Systems

Introduces system hardware and design techniques for embedded and hybrid reconfigurable systems. Intended for those interested in developing projects using hardware description languages to build application-specific computing systems. Industry standards are used for design, development and debugging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4633

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5634 (3) Graduate Microwave and RF Laboratory

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4634

Requisites: Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5643 (3) SW Engineering of Concurrent Systems

Addresses engineering of applications requiring multiple software processes running concurrently, sharing data, and communicating as a system in a single environment. Topics include performance analysis of architecture design; analysis of requirements, design and testing of synchronization and communication; the interplay of system design and performance with the impact of memory management, input/output, and file system support.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4643

Requisites: Requires prerequisite course of ECEN 5543 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5645 (3) Introduction to Optical Electronics

Introduces lasers, Gaussian optics, modulators, nonlinear optics, optical detectors, and other related devices.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5652 (3) Detection and Extraction of Signals from Noise

Introduces detection, estimation, and related algorithms. Topics in detection include simple/composite hypothesis testing, repeated observations and asymptotic performance and sequential detection. Topics in estimation include Bayesian estimation including minimum mean-square estimation and non-random parameter estimation. Topics in algorithms vary. Examples include algorithms for state estimation and smoothing in Hidden Gauss-Markov models and the expectation-maximization algorithm. Applications include communications, radar/sonar/geophysical signal processing, image analysis, authentication, etc.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5653 (3) Real-Time Digital Media

Learn how to design and build Linux-based real-time system applications for digital media encode/decode and transport. Course focus is on the process as well as fundamentals of designing, coding, and testing Linux-based real-time systems often used in industry for digital media systems. Students use POSIX kernel-mapped threads and drivers to implement real-time digital media solutions.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4653

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5672 (3) Digital Image Processing

Course objective is to present the fundamental techniques available for image representation and compression (e.g., wavelets), filtering (e.g., Wiener and nonlinear filter), and segmentation (e.g., anisotropic diffusion).

Requisites: Requires prerequisite course ECEN 5632 (minimum grade C-).

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5673 (3) Distributed Systems

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5673

Recommended: Prerequisite CSCI 5573 or a course in computer networks.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5682 (3) Theory and Practice of Error Control Codes

Introduces error control coding techniques for reliable transmission of digital data over noisy channels. Topics include algebraic characterizations of cyclic codes, convolutional codes, modern graph codes, decoding algorithms for block codes, Viterbi algorithm and iterative decoding on graphs. Applications include modern digital communication and storage systems including deep space communications, satellite broadcasting, cellular networks, and optical disk storage.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5683 (3) Programmable Logic Embedded System Design

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explores complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5686 (3) Optical Communications Systems

Emphasizes the elements that optical communication systems have in common with other communication systems. Works from a general communication system model toward fiber optic applications. Emphasizes the statistical nature of electronic based communication. Topics include 1) general system models, 2) detectors and receivers, 3) optical channels with emphasis on the single mode fiber channel, 4) coherent and incoherent systems: a) sources, b) modulation and c) detection, 5) special topics ranging from optical sensing to quantum communications.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Optics

ECEN 5692 (3) Principles of Digital Communication

Introduces fundamental principles of efficient and reliable transmission of information used in wired and wireless digital communication systems including cable modems, smart phones/tablets, cellular networks, local area (wi-fi) networks, and deep-space communications. Topics include bandwidth and power constraints, digital modulation methods, optimum transmitter and receiver design principles, error rate analysis, channel coding potential in wired/wireless media, trellis coded modulation, and equalization.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5696 (3) Fourier Optics

Introduces a system level approach to the analysis and design of optical systems. Topics include holography, Fourier transform properties of lenses, two-dimensional convolution and correlation functions, spatial filtering and optical computing techniques. Also covers coherent and incoherent imaging techniques, tomography, and synthetic aperture imaging.

Recommended: Prerequisites ECEN 3300 and ECEN 3410.

Additional Information: Departmental Category: Optics

ECEN 5737 (3) Adjustable-Speed AC Drives

Presents unified treatment of complete electrical drive systems: mechanical load, electrical machine, power converter, and control equipment. Emphasizes induction, synchronous, and permanent-magnet drives. Uses simulation programs (e.g., SPICE, Finite Element/Difference Program) to simulate drive system components (e.g., gating, inverter, electric machine).

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3170.

Additional Information: Departmental Category: Power

ECEN 5743 (3) SW Engineering of Distributed Systems

Addresses engineering of networked applications and self-contained embedded system products involving multiple processors. The fundamental concepts of software engineering are complicated by an application running simultaneously and asynchronously on multiple processors over a network. Topics: specification, analysis, design, and testing of distributed components including concerns of security, synchronization, transaction coordination, data replication, web services, and service oriented architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4743

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Prerequisite ECEN 4583 or ECEN 5543 or CSCI 5548.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5753 (3) Computer Performance Modeling

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4753 and CSCI 4753 and CSCI 5753

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5763 (3) Embedded Machine Vision and Intelligent Automation

Introduces students to machine vision and machine learning methods used in automation, autopilots and security and inspection systems. Embedded and automation topics include implementation of algorithms with FPGA or GP-GPU embedded real time co-processing for autopilots (intelligent transportation), general automation and security including methods for detection, classification, recognition of targets for inspection, surveillance, search and rescue, and machine vision navigation applications.

Requisites: Requires prereq courses of ECEN 5613 and 5623 (all minimum grade of C). Restricted to EEEN or ECEN or C-ECENEEN or C-EEEN or CRTGE students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5797 (3) Introduction to Power Electronics

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4797

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Power

ECEN 5803 (3) Mastering Embedded Systems Architecture

Acquire an understanding of embedded systems architectures for the purpose of creating prototypes or products for a variety of applications. The salient issues in the decision making process will be examined, including trade-offs between hardware and software implementations, processor and operating system selection and IP creation or acquisition. Projects will involve the latest software development and tools and hardware platforms.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5807 (3) Modeling and Control of Power Electronic Systems

Studies modeling and control topics in power electronics. Averaged switch modeling of converters, computer simulation, ac modeling of the discontinuous conduction mode, the current programmed mode, nulldouble injection techniques in linear circuits, input filter design, and low-harmonic rectifiers.

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5811 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4811 and ASEN 4216 and ASEN 5216

Additional Information: Departmental Category: Bioengineering

ECEN 5813 (3) Principles of Embedded Software

Introduces principles around embedded software elements and software development needed for the Embedded Systems Engineering core curriculum. Student will write C program applications that employ efficient, high performance and robust software design techniques. Topics include bare-metal firmware, C-programming optimization and introductions to underlying embedded architecture. Sound testing and debug practices will be instilled and utilized in several application projects.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5817 (3) Resonant and Soft-Switching Techniques in Power Electronics

Covers resonant converters and inverters, and soft switching; sinusoidal approximations in analysis of series, parallel, LCC, and other resonant dc-dc and dc-ac converters; state-plane analysis of resonant circuits; switching transitions in hard-switched and soft-switched PWM converters; zero-voltage switching techniques, including resonant, quasi resonant, zero voltage transition, and auxiliary switch circuits.

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5821 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4821 and ASEN 4426 and ASEN 5426

Additional Information: Departmental Category: Bioengineering

ECEN 5823 (3) Internet of Things Embedded Firmware

Acquire firmware development skills to meet low energy and internet connectivity demands of embedded systems. Event-driven firmware techniques will be explored through programming assignments, transitioning to programming an Internet of Things RF Network Protocol such as Bluetooth Low Energy or Thread. The coursework will align with the latest industry firmware and embedded wireless protocol trends.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5827 (3) Analog IC Design

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4827

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Power

ECEN 5830 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 5831 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4831 and ASEN 5436

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Bioengineering

ECEN 5837 (3) Mixed-Signal IC Design Lab

Software laboratory course extends the concepts developed in ECEN 5827 to full design and layout of mixed analog and digital custom integrated circuits. Assignments explore implementation of analog to digital and digital to analog converters, and final project develops a full custom IC for a target application.

Requisites: Requires prerequisite course of ECEN 5827 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5840 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the master's level. Numbered ECEN 5840-5849. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 5863 (3) Programmable Logic Embedded System Design

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explore complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5907 (3) Special Topics

Special topics class.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

ECEN 6016 (1-3) Special Topics

Additional Information: Departmental Category: Optics

ECEN 6139 (3) Logic Synthesis of VLSI Systems

Studies synthesis and optimization of sequential circuits, including retiming transformations and don't care sequences. Gives attention to hardware description languages and their application to finite state systems. Also includes synthesis for testability and performance, algorithms for test generation, formal verification of sequential systems, and synthesis of asynchronous circuits.

Recommended: Prerequisites ECEN 5139 and CSCI 5454.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 6144 (3) Electromagnetic Boundary Problems

Provides mathematical and physical fundamentals necessary for the systematic analysis of electromagnetic fields problems. Covers basic properties of Maxwell's equations, potentials and jump conditions; scattering and diffraction by canonical structures; Green's functions, integral equations and approximate methods. Requires some maturity in electromagnetics.

Requisites: Requires prereq course of ECEN 5114 or 5134 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 6800 (3) Master of Engineering Report

Additional Information: Departmental Category: General

ECEN 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

ECEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 6960 (3) Master of Engineering

Additional Information: Departmental Category: General

ECEN 7438 (3) Theory of Nonlinear Systems

Nonlinear systems and control. Introduction to nonlinear phenomena: multiple equilibria, limit cycles, bifurcations, complex dynamical behavior. Planar dynamical systems, analysis using phase plane techniques. Input-output analysis and stability. Passivity. Lyapunov stability theory. Feedback linearization. Exploration of examples and applications.

Requisites: Requires prerequisite course of ECEN 5448 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 7840 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 7849 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 8990 (1-10) Doctoral Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Additional Information: Departmental Category: General

Electrical Engineering - Master of Engineering (ME)

At the University of Colorado Boulder, the Department of Electrical, Computer & Energy Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees-programs/master-engineering>) has focused our ME degree on professional master's programs that serve highly employable disciplines and provide skills based on industry needs.

Distance Education

Students can earn this degree or take individual courses online via distance education through CU Boulder Connect. (<http://www.colorado.edu/connect/masters-programs>)

Dual Degree

Electrical, Computer, & Energy Engineering also offers a Dual ME Degree (<http://www.colorado.edu/emp/me-electrical-computer-and-energy-engineering-me-engineering-management>) with the Engineering Management Program.

Requirements

A minimum of 30 credit hours of academic work acceptable to the student's advisory committee and within the rules established by the College of Engineering and Applied Science and the Graduate School will be required for the ME degree (<http://www.colorado.edu/ecee/graduate-program/degrees-programs/master-engineering>).

- All 30 course credit hours in ECEN at the 5000-level or above or:
- Minimally, 15 in sufficiently technical ECEN 5000+ with remainder in related Engineering, Math, Science including up to 15 EMEN course credit hours upon permission from faculty advisor
- Optionally, maximally 6 of the non-ECEN (and non TLEN, non-EMEN) may be 4000+ level

Time Limit

All degree requirements must be completed within four years of the date of commencing course work (if on campus) or six years (if working full-time and taking only one course, each semester). Most students complete the degree in 2 to 5 years (on-campus, full-time student vs. off-campus, full-time worker / part-time student).

Electrical Engineering - Master of Science (MS)

The Department of Electrical, Computer & Energy Engineering (ECEE) offers degree options tailored to both working engineers looking to advance their careers and to those looking to pursue a career in academia. Research is concentrated in six broad areas:

- optics, nanostructures and bioengineering

- communications and signal processing
- computer engineering
- dynamics and controls
- electromagnetics, RF and microwaves
- power electronics

For more information, visit the department's Prospective Students (<http://www.colorado.edu/ecee/graduate-program/prospective-students>) webpage.

Distance Education

Students can take individual courses toward a master's degree through distance education (online). For more information, connect with the graduate program advisor or visit CU Boulder Connect's Master's Programs webpage.

Concurrent Degree Program

BS/MS in Electrical Engineering or Electrical & Computer Engineering and Electrical Engineering

The concurrent BS/MS program enables especially well qualified electrical engineering or electrical & computer engineering majors to be admitted to the MS program during the junior year of their BS program, and to work simultaneously toward their BS degree along with an MS in electrical engineering. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of the BS degree, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit-hour load.

Requirements include a minimum 3.25 GPA for admission; 30 credit hours of course work (including thesis hours), at least 24 of which are from courses at the 5000 level or above; at least 18 credit hours are from sufficiently technical ECEN courses; and specific focus area requirements are met.

For more information, visit the department's BS/MS Degrees (<http://www.colorado.edu/ecee/undergraduate-program/degrees/bs-ms-degrees>) webpage.

Requirements

All MS students must complete a total of 30 credit hours of course work (including thesis hours, if applicable) with a grade of C or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000 level or above, and at least 18 of those credits must be in sufficiently technical ECEN courses.

For more information, visit the department's Master of Science (<http://www.colorado.edu/ecee/graduate-program/degrees-programs/master-science>) webpage.

Degree Plans

Plan I: Thesis Option

Students must complete 4–6 credit hours of MS thesis. The total number of combined hours of independent study and thesis research shall not exceed 9 hours. The Plan I project culminates with an oral presentation and written thesis.

Plan II: Non-Thesis Option

A maximum of 6 credit hours of independent study can be used toward the 30-credit-hour requirement. No thesis is required, and there is no cumulative examination.

Time Limit

All degree requirements must be completed within four years of the date of commencing course work. Most students complete the degree in one to two years.

Electrical Engineering - Professional Master of Science (MSEE)

The professional Master of Science degree in electrical engineering is a professional degree composed of advanced courses relevant to working engineers.

The department offers two degree tracks, both of which result in a professional Master of Science degree in electrical engineering (MSEE).

Program Tracks

Embedded Systems Engineering (ESE) Track

The Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) (ESE) track provides comprehensive coverage of essential embedded technologies, current tools and trends. It is structured to provide students with a broad, versatile skill set and is coupled with industry input for continuous curriculum updates.

Through flexible core course options and electives, students enrolled in the ESE program pursue a 30-credit-hour MS degree. Many courses offer distance learning options through CU Boulder Connect.

Power Electronics (PPE) Track

Power Electronics (<http://www.colorado.edu/ecee/graduate-program/degrees/power-electronics-certificate>) is a key enabling technology in essentially all electronic systems and is increasingly important in the grid interface of renewable energy sources and in efficient electrical loads. The necessity for power electronics technology in these rapidly expanding areas creates an increasing need for design engineers equipped with knowledge and skills to actively participate in multidisciplinary teams.

Through flexible core course options and electives, students enrolled in this program pursue a 30-credit-hour MS degree. The program is intended for students and engineers with a BS degree in electrical engineering or the equivalent. Entering students must have adequate knowledge of circuits and electronics, as taught in undergraduate courses intended for EE majors.

Distance Education

Students can take individual courses toward a master's degree through distance education (online). For more information, connect with the graduate program advisor or visit CU Boulder Connect's Master's Programs webpage.

Requirements

Admission

A minimum undergraduate GPA of 3.00 is required for application to the master's program. Students who are interested in the PhD degree and have strong academics (including 3.50 or higher GPA) should apply directly to the PhD program (p. 1243).

Course Requirements

The following course requirements are subject to change; for the most current information, visit the department's Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) or Power Electronics (<http://www.colorado.edu/ecee/graduate-program/degrees/power-electronics-certificate>) webpages.

Students must complete a total of 30 credit hours (including both course and thesis hours) with a grade of C or better and a cumulative GPA of at least 3.00. At least 24 credit hours must be completed at the 5000-level or above, and at least 18 of those credits must be in sufficiently technical ECEN courses.

Program Tracks

Embedded Systems Engineering (ESE) Track

ESE Core Courses

Choose five of the following:	15
ECEN 5613	Embedded System Design
ECEN 5623	Real-Time Embedded Systems
ECEN 5803	Mastering Embedded Systems Architecture
ECEN 5683	Programmable Logic Embedded System Design
ECEN 5823	Internet of Things Embedded Firmware (IoT Embedded Firmware)
ECEN 5053	Special Topics (Embedding Sensors and Actuators)
ECEN 5023	Special Topics (Low Power Design Techniques)
ECEN 5813	Principles of Embedded Software

ESE Program Electives

Choose two of the following (or additional ESE core courses):	6
ECEN 5593	Advanced Computer Architecture
ECEN 5763	Embedded Machine Vision and Intelligent Automation
ECEN 5653	Real-Time Digital Media
ECEN 5032	Special Topics (Intro to Computer Security)
ECEN 5053	Special Topics (Developing Industrial Internet of Things)
ECEN 5053	Special Topics (Embedded Interface Design)

Open 5000-Level Electives

Choose three 5000-level electives from the ESE core, ESE electives or other ECEE courses in other departments, with approval of academic advisor.

Total Credit Hours 30

For more information, visit the department's Embedded Systems Engineering (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) webpage.

Power Electronics (PPE) Track

This curriculum is built around a core of three theory courses and two laboratory courses that provide practical laboratory and design experience of specific relevance to the practice of power electronics.

Required Theory Courses

ECEN 5797	Introduction to Power Electronics	3
ECEN 5807	Modeling and Control of Power Electronic Systems	3
ECEN 5817	Resonant and Soft-Switching Techniques in Power Electronics	3
ECEN 5517	Power Electronics and Photovoltaic Power Systems Laboratory	3

Required Laboratory Courses

Select one 5000-level project laboratory in power electronics (offered every fall). 3

Electives

Select one of the following power electronics electives: 3

Electric Vehicles

ECEN 5017	(Special Topics: Power Electronics for Electric Drivetrain Vehicles; fall)	
ECEN 5XX7	Electric Machines	
ECEN 5737	Adjustable-Speed AC Drives (spring)	

Analog and Mixed-Signal IC Design

ECEN 5827	Analog IC Design (fall)	
ECEN 5837	Mixed-Signal IC Design Lab (alternate spring semesters)	
ECEN 5XX8	Integrated Circuits and Devices for Power Electronics (alternate spring semesters)	

Grid Integration of Renewables

ECEN 5XX7	Control of Power Electronics in AC Systems and Microgrids	
ECEN 5XX7	Renewable Energy and the Future Power Grid	
ECEN 5XX7	Advances in Control and Optimization of Power Systems	
ECEN 5XX7	Power System Analysis	

Technical Electives

Choose three technical electives with advisor approval. 9
Recommended electives include courses in control systems, RF/microwaves and engineering management.

Open Elective

Choose an additional elective course. 3

Total Credit Hours 30

For more information, visit the department's Power Electronics (<http://www.colorado.edu/ecee/graduate-program/degrees/power-electronics-certificate>) webpage.

Time Limit

All degree requirements must be completed within four years of the date of commencing course work. Most students complete the degree in one-and-a-half to two years.

Electrical Engineering - Doctor of Philosophy (PhD)

The Doctor of Philosophy (PhD) is the terminal degree for those seeking a technical or research career in electrical engineering.

Students typically complete their PhD within 4 to 6 years, depending on whether they enter the program with a master's degree. It is possible for highly qualified students to enter the PhD program directly without a master's degree.

The primary focus of a PhD student is to perform novel research and support their faculty advisor. At the time of admission, PhD students must have a faculty advisor who agrees to accept the student into their research program and mentor their academic progress. Most of our PhD students are supported through research and teaching assistantships, and are also encouraged to apply for their own source of funding. Others are self-funded.

For more information, visit the department's Prospective Students (<http://www.colorado.edu/ecee/graduate-program/prospective-students>) webpage.

Requirements

Course Requirements

- A minimum of 30 credit hours of engineering, math and science courses numbered 5000 or above (at least 18 of these must be in sufficiently technical ECEN; none of these can be TLEN or EMEN) with a minimum of 3.00 GPA (with no lower than a B- in any single course).
- 30 credit hours of dissertation credit are required for the degree.
- A maximum of 21 credit hours may be transferred from another accredited institution and applied toward a PhD degree if approved by the graduate committee of the department and the Graduate School.
- All courses taken for the master's degree at the 5000 level or above at the University of Colorado may be applied toward the doctoral degree at the university.
- The formal course work must include a minimum of 18 credit hours of courses or their equivalent in electrical, computer and energy engineering.

Preliminary Examination

PhD students must take a preliminary examination by the first spring semester after they enroll. They are given two consecutive spring semesters to pass. If a student takes an exam in one research area on their first attempt and a different area on their second attempt, those comprise their two maximum attempts.

These prelim exams are given by faculty in respective research groups. Depending on the research area, there could be oral and written parts, or a literature search and an oral report, or some other type of exam. If a student passes one part on the first attempt, then they need only take and pass the remaining part during their subsequent attempt. Those who do not pass after two attempts can earn a master's pending fulfilling the requirements for that master's degree.

Comprehensive Examination

By no later than the fifth semester, students must pass an oral comprehensive examination before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School. The oral

examination before the committee is based primarily on a written proposal for the thesis research provided by the student to committee members in advance.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Engineering & Applied Science Embedded Systems Engineering - Graduate Certificate

Most of us will casually encounter dozens of embedded systems by mid-morning each day throughout our residences, roadways and workplaces. Fundamentally, an embedded system is some combination of hardware and software that is designed for a particular function. It senses a real-world condition, does some computing, then produces output data or control of some kind.

These intelligent machines are a permanent part of our global landscape, and are continuously being expanded and upgraded by a world of forward-thinking engineers and entrepreneurs. Application domains include aerospace and defense, energy, industrial automation, medical, networking and communication, security, transportation, and more. Also expected to fuel much more growth is an overarching megatrend referred to as the Internet of Things (IoT), which involves connecting more embedded systems to the internet, enabling countless human-to-machine and machine-to-machine applications ranging from home automation to security and many beyond.

Fueled largely by new internet protocols and wireless technology convergence, industry-wide estimates of 20 to 30 billion connected devices by 2020 are common among major technology research companies. Of course, this trend ushers in greater hardware and software design challenges of effectively managing and securing connected devices, as well as capturing and harnessing the vast amounts of data the devices are meant to produce around their associated services.

The Embedded Systems Engineering Certificate (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>), which is offered by the Department of Electrical, Computer and Energy Engineering, offers students the hardware and software knowledge and skills needed to design and implement these systems.

Distance Education

Students can complete the requirements for this graduate certificate via distance education (online) through Boulder Connect (<http://www.colorado.edu/connect/certificate-programs>).

Requirements

The Embedded Systems Engineering (ESE) Certificate (<http://www.colorado.edu/ecee/graduate-program/degrees/embedded-systems>) curriculum consists of two core courses and one elective

course from an approved list. Applicants for the certificate program must have been or currently be enrolled for a baccalaureate degree from an accredited institution and have satisfied the prerequisites for each course through course work or work experience. They need not be enrolled in a degree-granting program at the University of Colorado Boulder. A grade of B- or better is required for each course applied toward the certificate.

1. Completion of three courses totaling at least 9 credit hours.
2. Two of these ESE core courses plus one other ESE course (core or elective) OR all three of these:
 - a. ECEN 4613/5613 Embedded System Design
 - b. ECEN 4623/5623 Real-Time Embedded Systems
 - c. ECEN 5803 Mastering Embedded Systems Architecture
3. Graduate students pursuing an ESE Certificate are not required to matriculate into the ESE program sub-plan through a master's degree, although degree-seeking students enrolled in the ESE program will be given ESE course registration priority.
4. Admission to the Graduate School is not required for students pursuing only the Certificate.
5. ESE certificate credit hours may be applied towards a full master's degree, provided the student is admitted to the Graduate School. However, credit hours may not count towards both a BS and a Master's degree.

Power Electronics - Graduate Certificate

Power electronics is a key enabling technology in essentially all electronic systems ranging from wireless communication devices, portable and desktop computers, to telecommunication infrastructure systems, renewable energy systems, and industrial systems. The necessity for power electronics technology in these rapidly expanding areas creates a rising need for design engineers equipped with knowledge and skills to follow sound engineering principles and actively participate in multidisciplinary teams. The power electronics field has evolved rapidly with the advances in technology and introduction of many new application areas. As a result, it is likely that the required knowledge and skills were not in the curricula when many of today's professionals were in college. This creates a strong ongoing demand for continuing education of the workforce in the area of power electronics. The certificate program addresses the ongoing demand for skilled power electronics design engineers.

This program offers an opportunity for electrical engineers to obtain the specialized knowledge required to practice power electronics. It is intended for students and engineers having a BS degree in electrical engineering or equivalent.

Distance Education

Students can complete some requirements for this graduate certificate via distance education (online) through Boulder Connect (<http://www.colorado.edu/connect/certificate-programs>).

Requirements

The Power Electronics Certificate (<http://www.colorado.edu/connect/certificate-programs/power-electronics>) program was initiated by the Colorado Power Electronics Center, and is operated through the Department of Electrical, Computer, and Energy Engineering (<http://www.colorado.edu/ecee>) and through Boulder Connect (<http://www.colorado.edu/connect>).

www.colorado.edu/connect). A grade of B- or better is required for each course applied toward the certificate.

Required Courses and Semester Credit Hours

ECEN 5797	Introduction to Power Electronics	3
ECEN 5807	Modeling and Control of Power Electronic Systems	3
ECEN 5817	Resonant and Soft-Switching Techniques in Power Electronics	3
Total Credit Hours		9

Engineering Management

The Lockheed Martin Engineering Management Program (EMP) is a technically-based management and leadership program for the engineering and technical fields that prepares students for early to mid-career positions in a variety of industries. It is designed for students who are looking to advance in management, successfully contribute to the overall business or venture, and develop their leadership skills.

The program offers a Master of Engineering, five engineering dual degrees, graduate certificates and Six Sigma certification. Courses are offered both on campus and online (available in real-time distance class participation, as well as recorded videos for later viewing) to meet the needs of busy professionals. Courses are taught by faculty whose expertise in the engineering and technical industry and business leadership bring real-world experiences to the classroom.

For more information, visit the Lockheed Martin Engineering Management Program (EMP) (<http://www.colorado.edu/emp>) website.

Course code for this program is EMEN.

Master's Degree

- Engineering Management - Master of Engineering (ME) (p. 1247)

Certificates

- Engineering Entrepreneurship (p. 1248)
- Engineering Management (p. 1248)
- Leadership and Management (p. 1248)
- Managing Applied Research in Technology (p. 1248)
- Performance Excellence in Technology Management (p. 1248)
- Project Management (p. 1248)
- Quality Systems for Product and Process Engineering (p. 1249)
- Six Sigma Statistical Practitioner (p. 1249)
- Technology Ventures & Product Management (p. 1249)

Partnership Certificates

- Renewable and Sustainable Energy (<http://www.colorado.edu/emp/programs/graduate-program/certificates/renewable-and-sustainable-energy>)
- Water Engineering and Management (p. 1279)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bailey, Wendy Lynn (https://experts.colorado.edu/display/fisid_154942)
Instructor

Bozic, Christy L (https://experts.colorado.edu/display/fisid_155482)
Scholar In Residence/Lecturer; PhD, Purdue University

Johnson, Eben Ormston (https://experts.colorado.edu/display/fisid_149952)
Instructor; MBA, University of California-Davis

Kirschling, Wayne (https://experts.colorado.edu/display/fisid_123149)
Scholar In Residence; DBA, University of Colorado Boulder

Littlejohn, Ray Lynn (https://experts.colorado.edu/display/fisid_151752)
Scholar In Residence; PhD, University of Oklahoma Norman Campus

Moorer, Daniel Fuller (https://experts.colorado.edu/display/fisid_151590)
Scholar In Residence; PhD, University of Colorado Boulder

Murray, Seth (https://experts.colorado.edu/display/fisid_148038)
Instructor; ME, University of Colorado Boulder

Courses

EMEN 5000 (3) Engineering Analysis

Provides an introduction to the logical and systematic thinking required to solve typical engineering problems in mechanics, electricity, thermodynamics, fluid mechanics, electricity, thermodynamics, fluid mechanics and renewable energy. Emphasizes understanding the physical behavior of systems and applying the principles and laws from the physical sciences to analyze these systems. Required for non-engineers seeking admission to the Engineering Management graduate degree program.

EMEN 5005 (3) Introduction to Applied Statistical Methods

Covers statistical reasoning and statistical analysis for applications related to business and engineering decision making. Topics include an introduction to engineering and applied research, descriptive statistical analysis and its foundations, inferential statistics to include estimation and hypothesis testing using both traditional parametric as well as nonparametric procedures for research situations involving one or two groups of treatment conditions.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) or graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5010 (3) Introduction to Engineering Management

Learn concept, methods, activities and philosophies of business and be encouraged to utilize them in your professional activities. Interact with engineering management faculty who share what works based upon their engineering management experiences. Engage with our classmates on their business experience, thereby preparing you to interact more thoughtfully and knowledgeably with your professional colleagues.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5020 (3) Finance and Accounting for Engineering Managers

Learn concepts and skills necessary to assess financial performance, including the analysis of income statements, balance sheets and cash flow statements. Apply the concepts and skills of corporate finance to your personal finance, including the creating of a diversified investment portfolio. Enhance your management credentials by being knowledgeable in corporate finance.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5030 (3) Fundamentals of Project Management

Provides an in-depth introduction to the project management discipline, including the concepts, tools and techniques used in the management and leadership of projects small and large alike. Key topics covered include the role of the project manager; project team selection and management; cost, schedule and risk management; quality in projects; introduction to creating and maintaining project plans through the project lifecycle.

Requisites: Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5031 (3) Software Project Management

Introduces software project management as a critical element of software development activities throughout every area of human endeavor. Learn the software life cycle, software configuration management, code reviews, architectural influences and quality assurance with automated testing. Explore the impact on project success of the Capability Maturity Model (CMM) and United Modeling Language (UML).

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5608 and ECEN 5603

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

Recommended: Prerequisite software development experience.

EMEN 5032 (3) Advanced Topics in Project Management

Covers advanced topics in project management from a systems view based on the Project Management Body of Knowledge (PMBOK); spans the entire project life cycle. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5030 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5040 (3) Quality, Strategy, and Value Creation

Introduces the fundamentals of Business Performance Excellence (BPE including theories of leadership, theories of business, core competencies, Deming's theory of Profound Knowledge, strategic differentiation and all of the elements of strategy development.) Addresses strategic planning and policy deployment to map the company's strategy to all parts of the organization, a process strengthened through employee empowerment.

Requisites: Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5041 (3) Advanced Topics in Value Creation

Focuses on the advanced study of methods designed to maximize excellence in business performance. Includes a model to understand process and product tradeoffs, interactions with supplies, integrated manufacturing systems and meeting customer requirements while maximizing profitability. These characteristics are addressed both strategically and tactically through the use of case analysis, field study and experiential learning for production and service sectors.

Requisites: Requires prerequisite courses of EMEN 5005 and EMEN 5040 (all minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5042 (3) Methods for Quality Improvement

Develop in-depth expertise in the concepts, tools and techniques used in the management and measurement of quality and productivity. Apply statistics and probability to the topics of process variation and statistical process control and capability analysis for process, product, and measurement systems. Explore an introduction to design of experiments (DOE) in business and industry to improve both quality and performance.

Requisites: Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5043 (3) Advanced Topics in Quality Systems/ Engineering

Advanced study of methods, tools, techniques and systems associated with advanced quality applications. Includes a survey of advanced process control technologies, control schemes and measurement system analysis. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5042 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5050 (3) Leading Oneself

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5050

Requisites: Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5080 (3) Ethical Decision-Making in Engineering Management

Learn how to recognize ethical issues and dilemmas affecting managers in the workplace. Understand various models and practices offering solutions to these issues and how to create a culture of ethics and integrity in supporting and/or building a profitable, healthy and responsible organization.

Requisites: Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5090 (3) Marketing and Technology Ventures

Learn the basics of marketing for developing a technology innovation as a commercially successful product, including customer development as a part of product development. Designed to be of interest to engineers in existing companies and startups. The format includes in-depth discussions of real-world case studies and marketing strategies for the high tech environment. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5020 (minimum grade B). Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5094 (3) Entrepreneurship for Engineers

Explores the concepts of entrepreneurship as it relates to forming an innovative and successful technology based venture. Takes a very practical approach to entrepreneurship with a semester long project that incorporates all the fundamental elements of new business creation. The objective is to enable engineering students to transform their own creative technical idea into a viable and sustainable business opportunity.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

Grading Basis: Letter Grade

EMEN 5400 (3) Product Development and Design

Provides state-of-the-art techniques for improving the identification and creation of new products, services and brands that provide an exceptional customer experience. Both proven and emerging management techniques in new product management are covered.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

Recommended: Prerequisites EMEN 5020 and EMEN 5090.

EMEN 5405 (3) Fundamentals of Systems Engineering

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5188

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5500 (3) Lean and Agile Management

Learn lean and agile concepts and tools to improve customer value, improve processes and reduce waste. Examine and apply lean and agile principles in diverse circumstances including hardware/software, product development/ongoing operations and manufacturing products/providing services. Apply your learning to improving performance in current responsibilities, whether as an individual contributor or as a manager.

Equivalent - Duplicate Degree Credit Not Granted: OPIM 6080

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5610 (3) Advanced Statistical Methods for Engineering Research

Combines intermediate and advanced statistical methods (Two- and Three-Way ANOVA and post hoc analyses for a large variety of specific designs). Real data sets are employed permitting a focus on engineering research in support of business decision making through the integration of cost benefit analysis and process performance. Parametric as well as nonparametric methods of analysis are included.

Requisites: Requires prerequisite course of EMEN 5900 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5620 (3) Data Mining and Screening Experiments for Engineering Research

Combines intermediate and advanced statistical methods with practical research applications. Develops commonly used statistical models such as Two and Three-Way Analysis of Variance and the analysis of Fractional Factorial Designs for the solution of common business and industrial research problems. The statistical models are implemented and interpreted in the context of actual data sets using available statistical software.

Requisites: Requires prerequisite course of EMEN 5610 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5710 (3) Applied Business Decisions

Team up with fellow classmates to launch a high-tech company as part of an eight quarter project in a competitive, simulated business environment. Make decisions in product development, marketing, operations and finance based on results of the previous quarter. Prepare a business pitch and executive summary to justify additional venture capital or a bank loan. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5020 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5825 (3) Intrapreneurship & Innovation

Learn a comprehensive set of business concepts, skills and tools to launch and manage intrapreneurial ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills, tools and awareness to be successful colleagues, managers and leaders in scientific and engineering industries. Gain valuable business acumen using a hands-on and learning environment.

EMEN 5830 (3) Special Topics

Non-EMP students require instructor consent.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering graduate students only.

EMEN 5840 (1-3) Independent Study Project

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. Non-EMP students require instructor permission.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Engineering Management Program (EMEN) only.

EMEN 5900 (3) Research Methods and Experimental Design

Explores commonly used research methods including analytical, agreement, descriptive and relational methods; experimental design including incorporation, nesting, blocking and controlling; threats to the internal and external validity of research. Also reviewed are sampling procedures and considerations, measurement validity and reliability, and managing the research study.

Requisites: Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 6805 (1) Capstone Preparation

Students determine capstone research question, conduct literature review, develop research methodology and project plan, write a proposal, and select capstone committee.

Requisites: Requires prerequisite course of EMEN 5825 or EMEN 5900 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

EMEN 6810 (2) Capstone Completion

Continues EMEN 6805 as the second half of a two-course sequence for the engineering management capstone project. Students conduct agreed-upon research, research and analyze results, develop recommendations, write a final report, and present the project to the committee for evaluation.

Requisites: Requires prerequisite course of EMEN 6805 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

EMEN 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students in Engineering Management Program (EMEN) only.

Grading Basis: Pass/Fail

Engineering Management - Master of Engineering (ME)

The Master of Engineering in engineering management is an excellent alternative to an MBA for engineers, scientists and technical professionals who want to move into management. The program facilitates technically minded people to learn and practice data-driven management, develop leadership capabilities and apply proven principles for business performance improvement.

The core curriculum addresses the business basics of engineering management, project management, finance and accounting, business communication and leadership. Elective courses provide in-depth skills in areas such as Six Sigma, quality management, product management, R&D, ethical decision-making, lean and agile management and software

management. Graduates of the program are prepared to lead people and organizations and respond to the challenges that go along with managing engineering and technology businesses.

For more information, visit the program's Master of Engineering in Engineering Management (<http://www.colorado.edu/emp/programs/graduate-degree/master-engineering-management>) webpage.

Dual Degree Programs

In addition to the Master of Engineering in engineering management, the Engineering Management Program also offers five engineering dual degrees:

- Computer Science (ME) & Engineering Management (ME)
- Aerospace Engineering Sciences (MS) & Engineering Management (ME)
- Electrical, Computer, and Energy Engineering (ME) & Engineering Management (ME)
- Mechanical Engineering (ME) & Engineering Management (ME)
- Telecommunications (MS) & Engineering Management (ME)

For more information, visit the program's Dual Graduate Degree Programs (<http://www.colorado.edu/emp/programs/graduate-degree/dual-degree-program>) webpage.

Requirements

The following course requirements are subject to change; for the most current information, visit the program's Degree Requirements (<http://www.colorado.edu/emp/degree-requirements>) webpage.

Degree Requirements

The ME degree requires 30 credit hours, consisting of five core courses and five elective courses. Additional degree requirements include a written master's exam in student's final semester of classes.

For those students that are required to take EMEN 5000, this is a prerequisite course and cannot be counted towards the engineering management degree.

Required Courses

EMEN 5010	Introduction to Engineering Management	3
EMEN 5020	Finance and Accounting for Engineering Managers	3
EMEN 5030	Fundamentals of Project Management	3
or EMEN 5031	Software Project Management	
or EMEN 5405	Fundamentals of Systems Engineering	
EMEN 5050	Leading Oneself	3
EMEN 5830	Special Topics (Engineering Communication)	3

Elective Courses

Choose five of the following:		15
EMEN 5005	Introduction to Applied Statistical Methods	
EMEN 5031	Software Project Management	
EMEN 5032	Advanced Topics in Project Management	
EMEN 5041	Advanced Topics in Value Creation	
EMEN 5042	Methods for Quality Improvement	
EMEN 5043	Advanced Topics in Quality Systems/ Engineering	
EMEN 5080	Ethical Decision-Making in Engineering Management	
EMEN 5090	Marketing and Technology Ventures	

EMEN 5094	Entrepreneurship for Engineers
EMEN 5400	Product Development and Design
EMEN 5405	Fundamentals of Systems Engineering
EMEN 5500	Lean and Agile Management
EMEN 5610	Advanced Statistical Methods for Engineering Research
EMEN 5620	Data Mining and Screening Experiments for Engineering Research
EMEN 5710	Applied Business Decisions
EMEN 5825	Intrapreneurship & Innovation
EMEN 5900	Research Methods and Experimental Design
<hr/>	
Total Credit Hours	30

Engineering Entrepreneurship - Graduate Certificate

Whether forming a brand new company, or being part of a larger organization, the Engineering Entrepreneurship Graduate Certificate (<http://www.colorado.edu/emp/Engineering-Entrepreneurship-Certificate>) will help students learn to launch, lead and manage a viable new business. Courses are taught by faculty with expertise who have successfully launched start-ups. This certificate culminates with the "launch" of a new business for a project of the student's choice, pitched by the student to business leaders and investors.

Requirements

This Engineering Management Graduate Certificate (<http://www.colorado.edu/emp/Engineering-Entrepreneurship-Certificate>) requires 12 credit hours.

Engineering Management - Graduate Certificate

The Engineering Management Graduate Certificate (<http://www.colorado.edu/emp/engineering-management>) from the Engineering Management Program (<http://www.colorado.edu/emp>) is ideal for the student who already has a master's degree in a technical discipline, but wants to gain business management skills. Students learn high-level components of finance, accounting, quality management and managing people in a technical or engineering environment. This certificate will help students move into mid-career management positions, or excel in their current position.

Requirements

Engineering Management Graduate Certificate requires 12 credit hours.

Leadership and Management - Graduate Certificate

With the Leadership and Management Graduate Certificate (<http://www.colorado.edu/emp/leadership-and-management>) from the Engineering Management Program (<http://www.colorado.edu/emp>), you'll gain an in-depth understanding of management, leadership and strategy deployment to improve performance quality; discover how to use natural strengths to become the best leader possible; learn to navigate ethical

decisions and maintain integrity as a leader; and find the leverage points in an organization for delivering exceptional results.

Requirements

The Leadership and Management Certificate (<http://www.colorado.edu/emp/leadership-and-management>) requires 12 credit hours.

Managing Applied Research in Technology - Graduate Certificate

The Managing Applied Research in Technology Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/managing-applied-research-technology>) is one of several graduate certificate programs (<http://www.colorado.edu/emp/cert-grad>) offered by the Engineering Management Program and is ideal for students who aspire to lead improvement projects in complex systems and to gain problem-solving tools and strategies. Delve deeper into statistical analysis; gain expertise in quality improvement, problem solving and cost-reduction analysis.

Requirements

The Managing Applied Research in Technology Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/managing-applied-research-technology>) requires 12 credit hours.

Performance Excellence in Technology Management - Graduate Certificate

Our Performance Excellence in Technology Management Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/performance-excellence-technology-management>) is ideal for students who aspire to enhance their strategic planning skills for managing processes and people. Students learn the cutting-edge Business Performance Excellence system to drive cost reduction, identify revenue-generating "sweet spots" and develop leadership skills that improve performance quality.

Requirements

The Performance Excellence in Technology Management Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/performance-excellence-technology-management>) requires 12 credit hours.

Project Management - Graduate Certificate

This Project Management Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/project-management>) is ideal for students who aspire to develop management capabilities that build on technical expertise. Gain the skills and management savvy to take any project from beginning to end. This certificate fulfills both the in-class requirement for PMP Certification and project requirements for other CU-Boulder degree programs.

Requirements

This Project Management Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/project-management>) requires 9 credit hours.

Quality Systems for Product and Process Engineering - Graduate Certificate

The Quality Systems for Product and Process Engineering Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/quality-systems-product-and-process-engineering>) is ideal for students who aspire to lead projects for continuous process improvement in their workplace. Gain technical expertise to successfully manage initiatives in quality control, problem solving and reliability improvement.

Requirements

This Quality Systems for Product and Process Engineering Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/quality-systems-product-and-process-engineering>) requires 12 credit hours.

Six Sigma Statistical Practitioner - Graduate Certificate

The Six Sigma Statistical Practitioner Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/six-sigma-statistical-practitioner>) is ideal for students who aspire to become a statistical facilitator, applied researcher or plant statistician, designing and conducting experiments to improve performance quality. Learn advanced statistical tools that support the Define, Measure, Analyze, Improve and Control methodology. This satisfies final project requirements for some engineering MS disciplines.

Requirements

The Six Sigma Statistical Practitioner Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/six-sigma-statistical-practitioner>) requires 12 credit hours.

Technology Ventures & Product Management - Graduate Certificate

The Technology Ventures & Product Management Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/technology-ventures-product-management>) is ideal for the engineer in any size company (start-up to Fortune 500) who aspires to manage strategy and implementation of technology-based product development. Case studies and business simulation exercises allow hands-on practice with technology evaluation and product development management. Gain the skills needed to successfully lead a product development team.

Requirements

The Technology Ventures and Product Management Graduate Certificate (<http://www.colorado.edu/emp/programs/graduate-program/certificates/technology-ventures-product-management>) requires 12 credit hours.

Environmental Engineering

Our Environmental Engineering Graduate Program (<http://www.colorado.edu/even>) focuses on the fundamental and applied understanding of the processes which govern natural and engineered systems. The program includes 22 primary faculty, and covers topics ranging from drinking water, wastewater and water reuse treatment, ecosystem processes, fate and transport of organic contaminants, alternative energy, air quality, sustainability, and environmental engineering for developing communities. The program offers MS, Professional MS, and PhD degrees in Environmental Engineering.

The Graduate Record Examination (GRE), consisting of the aptitude tests and advanced test in engineering, is used to evaluate master of science and doctor of philosophy candidates.

Course code for this program is EVEN.

Master's Degrees

- Environmental Engineering - Master of Science (MS) (p. 1249)
- Environmental Engineering - Professional Master of Science (MSENV) (p. 1250)

Doctoral Degree

- Environmental Engineering - Doctor of Philosophy (PhD) (p. 1251)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Summers, R Scott (https://experts.colorado.edu/display/fisid_113151)
PhD, Stanford University

Walker, Michael Edward (https://experts.colorado.edu/display/fisid_155103)
Instructor; PhD, Illinois Institute of Technology

Courses

EVEN 6940 (1) Master's Candidate for Degree
Grading Basis: Pass/Fail

EVEN 6950 (1-6) Master's Thesis
Repeatable: Repeatable for up to 6.00 total credit hours.

EVEN 8990 (1-10) Doctor's Thesis
Repeatable: Repeatable for up to 10.00 total credit hours.

Environmental Engineering - Master of Science (MS)

The Environmental Engineering Program focuses on the fundamental and applied understanding of the processes which govern natural and engineered systems. The program includes 22 primary faculty and covers such topics as drinking water, wastewater and water reuse treatment, ecosystem processes, fate and transport of organic contaminants, alternative energy, air quality, sustainability and environmental engineering for developing communities.

For more information, visit the program's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

Requirements

General Requirements

The following course requirements are subject to change; for the most current information, visit the department's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

Students must complete at least 30 credit hours, including:

- 6 credit hours in the environmental engineering and science core (CVEN 5464 and CVEN 5404 or CHEM 5151)
- 9–18 credit hours in an emphasis area
- 0–9 credit hours of elective courses

Elective courses will be determined in consultation with the student's faculty advisor.

For students who have undertaken prior graduate study, up to 9 hours of relevant graduate-level course work may be transferred to meet the course requirements for the MS degree, following the rules established by the Graduate School for transfer credit.

Degree Plans

Requirements for the Master of Science in environmental engineering can be fulfilled in two ways.

Plan I: Thesis Option

In addition to the 24 credit hours of course work described above, candidates complete 6 credit hours of thesis credit, with the successful completion and defense of an MS thesis.

Plan II: Non-Thesis Option

In addition to the 24 credit hours of course work described above, candidates complete an additional 6 credit hours of elective courses or independent study.

Environmental Engineering - Professional Master of Science (MSENV)

The professional master's degree (MSENV) in environmental engineering is a course work-only program that offers possibilities for a range of prospective students.

Whether a prospective student is working engineer or an undergraduate considering widening their exposure to areas of environmental engineering, we have program options to meet their needs.

For more information, visit the department's Curriculum and Courses (<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

Requirements

General Requirements

The following course requirements are subject to change; for the most current information, visit the department's Curriculum and Courses

(<http://www.colorado.edu/even/prospective-students/graduate-studies/curriculum-and-courses>) webpage.

The professional master's degree requires 30 credit hours of graduate-level courses with a minimum cumulative GPA of 3.00.

For students who have undertaken prior graduate study, up to 9 semester credit hours of relevant graduate-level course work may be transferred to meet the course requirements for the MSENV degree, following the rules established by the Graduate School for transfer credit.

General Environmental Engineering Track

Required Courses

CVEN 5464	Environmental Engineering Processes	3
CVEN 5404	Water Chemistry or CHEM 5151 Atmospheric Chemistry	3
CVEN 5484	Applied Microbiology and Toxicology	3

Electives

Choose one of the following:		3
CVEN 5524	Drinking Water Treatment	
CVEN 5534	Wastewater Treatment	
CVEN 5474	Hazardous and Industrial Waste Management	
Choose one of the following:		3
CVEN 5834	Special Topics (Fundamentals of Air Quality Science and Engineering)	
MCEN 5131	Air Pollution Control Engineering	
Choose five additional electives in consultation with the student's faculty advisor.		15
Total Credit Hours		30

Engineering for Developing Communities Track

Required Courses

CVEN 5464	Environmental Engineering Processes	3
CVEN 5404	Water Chemistry or CHEM 5151 Atmospheric Chemistry	3
CVEN 5484	Applied Microbiology and Toxicology	3
CVEN 5919	Sustainable Community Development 1	3
CVEN 5929	Sustainable Community Development 2	3
CVEN 5939	Sustainable Community Development Field Practicum	3
ATLS 5250	Fieldwork Methods for ICTD Practitioners	3
CVEN 5969	Water, Sanitation, and Hygiene	3

Electives

Choose one of the following:		3
CVEN 5524	Drinking Water Treatment	
CVEN 5534	Wastewater Treatment	
CVEN 5474	Hazardous and Industrial Waste Management	
CVEN 5554	Fundamentals of Air Quality Management	
MCEN 5131	Air Pollution Control Engineering	
Choose one additional elective in consultation with the student's faculty advisor.		3
Total Credit Hours		30

Environmental Engineering - Doctor of Philosophy (PhD)

The graduate program in environmental engineering focuses on the fundamental and applied understanding of the processes that govern natural and engineered systems. The program includes 22 primary faculty and covers topics that include drinking water, wastewater and water reuse treatment; ecosystem processes; fate and transport of organic contaminants; alternative energy; air quality; sustainability; and environmental engineering for developing communities.

The Graduate Record Examination (GRE), consisting of the aptitude tests and advanced test in engineering, is used to evaluate PhD candidates.

For more information, visit the Environmental Engineering Program (<http://www.colorado.edu/even>) website.

Requirements

The PhD in environmental engineering requires 30 credit hours of relevant graduate-level course work, plus 30 credit hours of thesis credit. PhD students are also required to successfully complete a preliminary exam, a comprehensive exam and a final dissertation defense.

The applicant for this degree must demonstrate the capability for both rigorous academic accomplishments and independent research.

All doctoral students must have completed the environmental engineering core courses (6 credit hours), and a quantitative analysis class (3 credit hours). Course work must be completed with a minimum cumulative GPA of 3.00.

MS graduates from our program may transfer up to 30 credit hours of relevant graduate-level courses, pending program approval. Up to 21 credit hours of previous graduate-level work from another institution may be transferred with advisor and Graduate School approval.

Preliminary Examination

Students must pass a preliminary examination based on MS degree-level course work in environmental engineering topics. Each doctoral student shall take a preliminary examination as determined by the faculty of the specialty area in which the student is enrolled, normally not later than 12 months from the time the student is first enrolled in the doctoral program. The student must pass this examination in order to continue in the doctoral program.

Comprehensive Examination

By no later than the fifth semester, students must also take and pass a comprehensive examination. The comprehensive examination shall consist of a written and an oral examination. The exam may not be attempted until the student's last semester of formal course work. At the comprehensive examination, the student shall present a plan for the dissertation research to the advisory committee for approval. Failure to pass the comprehensive examination may be remedied by repeating the examination after an interval of not less than four months.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member who is a member of the environmental engineering faculty.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Materials Science and Engineering

Materials Science and Engineering (<http://www.colorado.edu/mse>) offers tracks of study in electronic, magnetic and photonics materials, soft materials, structural materials, materials for energy, biomaterials, and computational materials science.

Materials Science and Engineering (MSE) is an interdisciplinary program aimed at providing rigorous education in materials science and engineering and the fundamental physics, engineering, chemistry, and biology that underlie this discipline. Educational goals are achieved through both course work and training in cross-disciplinary research supervised by one or more science and engineering faculty members.

The program offers six unique tracks of study:

- electronic, magnetic, and photonics materials
- soft materials
- structural materials
- materials for energy
- biomaterials
- computational materials science

The MSE program is directed by Professor Chris Bowman of the Department of Chemical and Biological Engineering.

Master's Degree

- Materials Science and Engineering - Master of Science (MS) (p. 1252)

Doctoral Degree

- Materials Science and Engineering - Doctor of Philosophy (PhD) (p. 1252)

Courses

MSEN 5000 (1-3) Fundamentals of Materials Science and Engineering

Discusses fundamental topics in materials science and engineering.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

MSEN 5370 (3) Materials Thermodynamics

Reviews thermodynamics fundamentals and applies them to understand the chemical, thermal and mechanical behavior of materials. Examines equations of state, solution theory, equilibrium diagrams and phase changes.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

MSEN 5840 (1-6) Independent Study

Offers an opportunity for students to do independent work. Subject arranged to fit the needs of the student.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to MS and PhD students in the Materials Science and Engineering program (MTEN) only.

MSEN 5919 (1-5) Special Topics in MSE

Offers an opportunity for special topics in MSE. Subject arrangement to fit the needs of the program.

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to graduate students only.

MSEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to MS students in the Materials Science and Engineering program (MTEN) only.

MSEN 8990 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to PhD students in the Materials Science and Engineering program (MTEN) only.

Materials Science and Engineering - Master of Science (MS)

The materials science and engineering (MSE) professional master's program is an interdisciplinary MS program. Students in the professional master's program complete 30 hours of course work and are not eligible to hold a graduate teaching or research appointment. Students must submit an online application to be considered for admission into the PhD program.

For more information, visit the program's Professional Master's Degree (<http://www.colorado.edu/mse/professional-masters-degree>) webpage.

Requirements

The course requirements for the professional master's degree are the same as those for the Materials Science and Engineering PhD (p. 1252). Students enrolled in the professional master's program are not eligible to hold a teaching assistantship or research assistantship appointment.

For more information, visit the program's Professional Master's Degree webpage.

Materials Science and Engineering - Doctor of Philosophy (PhD)

The materials science and engineering (MSE) program is an interdisciplinary PhD program aimed at providing a rigorous education in materials science and engineering and the fundamental physics, engineering, chemistry and biology that underlie this discipline.

Educational goals are achieved through both course work and training in cross-disciplinary research supervised by one or more science and engineering faculty members.

For more information, visit the Materials Science and Engineering (<http://www.colorado.edu/mse>) website.

Requirements

All PhD students must declare a track by the second semester. With the approval of their advisor, the student can change tracks. The course program should represent a coordinated approach to the attainment of the student's ultimate goals, including class work, professional preparation and research.

The following course requirements are subject to change; for the most current information, visit the department's Coursework (<http://www.colorado.edu/mse/graduate-study/coursework>) webpage.

Required Core Courses for All Tracks

CHEM 5261	Organic Materials: Structures and Functions	3
MSEN 5370	Materials Thermodynamics	3
MCEN 5228	Special Topics in Mechanical Engineering (section 009)	3

Required Track-Specific Courses¹

Students must take both required track-specific electives.

Track-Specific Electives¹

Students must select two approved track-specific electives.

Breadth Electives

Students must select three breadth electives with approval of the PhD research advisor and committee. Independent study and MSEN 5000 may count as breadth electives.

Total Credit Hours 30

¹ Required track-specific courses and approved track-specific electives are listed on the department's Coursework (<http://www.colorado.edu/mse/graduate-study/coursework>) webpage.

Preliminary Examination

The preliminary exam will normally be given in the summer of the student's second year. If the first attempt is failed, a second attempt will be scheduled in the following months. The second prelim attempt should be completed before the beginning of the third academic year. Students who have a master's degree should complete the preliminary exam in the third semester of study. If a student fails their first attempt, then they must retake the exam at latest in the following semester. Two successive failures result in a terminal MS as the highest possible degree.

Comprehensive Examination

Before admission to candidacy for the doctoral degree, students must pass a comprehensive examination, which shall consist of a written and an oral examination in the field of concentration and related fields. At the comprehensive examination, the student shall present a plan for the dissertation research to the Advisory Committee for approval.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All degree requirements must be completed within six years of the date of commencing course work.

Mechanical Engineering

The University of Colorado Boulder Mechanical Engineering Graduate Program (<http://www.colorado.edu/mechanical/prospective-students/graduate>) is one of the top ranked programs in the U.S. News & World Report Best Graduate Schools issue among public universities. As a student, you will receive a strong education and conduct groundbreaking tier-one research. We have 40+ faculty members conducting fundamental and applied research in air quality, biomedical, materials, mechanics of

materials, micro/nanoscale, robotics and systems design, and thermo fluid sciences.

Boulder is also home to research and development operations for many large companies and four federal research labs: the National Center for Atmospheric Research, the National Institute for Standards and Technology, the National Oceanic and Atmospheric Administration, and the National Renewable Energy Laboratory.

Recent doctoral and master's graduates accepted employment at companies including, but not limited to, the following: ConocoPhillips, Ford, Google, NASA Jet Propulsion Laboratory, Lockheed Martin, Nike, Sandia National Laboratories, and Seagate. Many of our graduating PhD students also enter careers in academia.

Master's Degrees

- Mechanical Engineering - Master of Science (MS) (p. 1259)
- Mechanical Engineering - Professional Master of Science (MSME) (p. 1260)
- Mechanical Engineering - Master of Engineering (ME) (p. 1259)

Doctoral Degree

- Mechanical Engineering - Doctor of Philosophy (PhD) (p. 1260)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa Abdalla (https://experts.colorado.edu/display/fisid_144736)
Associate Professor; PhD, University of Michigan Ann Arbor

Bergquist, Marcelo R (https://experts.colorado.edu/display/fisid_144022)
Senior Instructor/Instructor Adjunct

Borden, Mark A (https://experts.colorado.edu/display/fisid_148514)
Associate Professor; PhD, University of California-Davis

Branch, Melvyn C.
Professor Emeritus

Bright, Victor Mark (https://experts.colorado.edu/display/fisid_112696)
Professor; PhD, Georgia Institute of Technology

Brower, Timothy L (https://experts.colorado.edu/display/fisid_147553)
Senior Instructor; PhD, Colorado State University

Carlson, Lawrence E.
Professor Emeritus

Castro, Francisco (https://experts.colorado.edu/display/fisid_147992)
Instructor; PhD, University of Colorado Boulder

Daily, John W (https://experts.colorado.edu/display/fisid_100131)
Professor; PhD, Stanford University

Datta, Subhendu K.
Professor Emeritus

Ding, Yifu (https://experts.colorado.edu/display/fisid_146088)
Associate Professor; PhD, University of Akron

Dunn, Martin L (https://experts.colorado.edu/display/fisid_103706)
Professor; PhD, University of Washington

Ferguson, Virginia Lea (https://experts.colorado.edu/display/fisid_110131)
Associate Professor; PhD, University of Colorado Boulder

Geers, Thomas L.
Professor Emeritus

George, Steven (https://experts.colorado.edu/display/fisid_103289)
Professor; PhD, University of California-Berkeley

Greenberg, Alan R.
Professor Emeritus

Hamlington, Peter Edward (https://experts.colorado.edu/display/fisid_149800)
Assistant Professor; PhD, University of Michigan Ann Arbor

Hannigan, Michael P. (https://experts.colorado.edu/display/fisid_122655)
Associate Professor; PhD, California Institute of Technology

Henze, Daven Ker (https://experts.colorado.edu/display/fisid_144858)
Associate Professor; PhD, California Institute of Technology

Hertzberg, Jean R (https://experts.colorado.edu/display/fisid_105315)
Associate Professor; PhD, University of California-Berkeley

Humbert, James Sean (https://experts.colorado.edu/display/fisid_156202)
Associate Professor; PhD, California Institute of Technology

Kassoy, David R.
Professor Emeritus

Keplinger, Christoph Matthias (https://experts.colorado.edu/display/fisid_156421)
Assistant Professor; PhD, Johannes Kepler University Linz (Austria)

Knutsen, Jeffrey Steven (https://experts.colorado.edu/display/fisid_145534)
Instructor; PhD, University of Colorado Boulder

Kotys-Schwartz, Daria (https://experts.colorado.edu/display/fisid_144738)
Senior Instructor; PhD, University of Colorado Boulder

Kreith, Frank
Professor Emeritus

Lee, Se-Hee (https://experts.colorado.edu/display/fisid_144739)
Professor; PhD, Seoul Nat Univ (Korea)

Lee, Yung-Cheng (https://experts.colorado.edu/display/fisid_103170)
Professor; PhD, University of Minnesota Twin Cities

Li, Baowen (https://experts.colorado.edu/display/fisid_156203)
Professor; PhD, Carl von Ossietzky Universitat Oldenburg (Germany)

Long, Rong (https://experts.colorado.edu/display/fisid_151301)
Assistant Professor; PhD, Cornell University

Maute, Kurt Karl (https://experts.colorado.edu/display/fisid_113875)
Professor; PhD, Univ of Stuttgart (Germany)

McNeill, Nathan John (https://experts.colorado.edu/display/fisid_151518)
Instructor; PhD, Purdue University

Milford, Jana (https://experts.colorado.edu/display/fisid_103268)
Professor; PhD, Carnegie Mellon University

Miller, Shelly Lynn (https://experts.colorado.edu/display/fisid_110394)
Professor; PhD, University of California-Berkeley

Murray, Todd W (https://experts.colorado.edu/display/fisid_146549)
Associate Professor; PhD, Johns Hopkins University

Neu, Corey P (https://experts.colorado.edu/display/fisid_156210)
Associate Professor; PhD, University of California-Davis

Norris, Jan Adam (https://experts.colorado.edu/display/fisid_101412)
Lecturer; PhD, University of Colorado Boulder

Pellegrino, John (https://experts.colorado.edu/display/fisid_130902)
Research Professor; PhD, University of Colorado Boulder

Raj, Rishi (https://experts.colorado.edu/display/fisid_108413)
Professor; PhD, Harvard University

Reamon, Derek T (https://experts.colorado.edu/display/fisid_120538)
Senior Instructor; PhD, Stanford University

Rentschler, Mark Edwin (https://experts.colorado.edu/display/fisid_146091)
Associate Professor; PhD, University of Nebraska-Lincoln

Rieker, Gregory Brian (https://experts.colorado.edu/display/fisid_151727)
Assistant Professor; PhD, Stanford University

Ruben, Shalom D (https://experts.colorado.edu/display/fisid_149492)
Instructor; PhD, University of California-Los Angeles

Steinbrenner, Julie Elizabeth (https://experts.colorado.edu/display/fisid_152041)
Instructor; PhD, Stanford University

Stoldt, Conrad R (https://experts.colorado.edu/display/fisid_126290)
Professor; PhD, Iowa State University

Stowell, Michael (https://experts.colorado.edu/display/fisid_124136)
Associate Professor; PhD, California Institute of Technology

Tan, Wei (https://experts.colorado.edu/display/fisid_141464)
Associate Professor; PhD, University of Illinois at Chicago

Van Zeghbroeck, Bart J (https://experts.colorado.edu/display/fisid_104113)
Professor; PhD, University of Colorado Boulder

Vance, Marina Eller (https://experts.colorado.edu/display/fisid_158217)
Assistant Professor; PhD, Virginia Polytechnic Institute and State Univ

Vasilyev, Oleg V. (https://experts.colorado.edu/display/fisid_126641)
Professor; PhD, University of Notre Dame

Vernerey, Franck J. (https://experts.colorado.edu/display/fisid_144760)
Associate Professor; PhD, Northwestern University

Weidman, Patrick D.
Professor Emeritus

Xiao, Jianliang (https://experts.colorado.edu/display/fisid_149777)
Assistant Professor; PhD, Northwestern University

Yang, Ronggui (https://experts.colorado.edu/display/fisid_142640)
Professor; PhD, Massachusetts Institute of Technology

Yin, Xiaobo (https://experts.colorado.edu/display/fisid_153484)
Assistant Professor; PhD, Stanford University

Zable, Jack
Professor Emeritus

Courses

MCEN 5020 (3) Methods of Engineering Analysis 1

Studies selected topics from linear algebra, ordinary differential equations, and Fourier series. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Math

MCEN 5021 (3) Introduction to Fluid Dynamics

Focuses on physical properties of gases and liquids, and kinematics of flow fields. Analyzes stress; viscous, heat-conducting Newtonian fluids; and capillary effects and surface-tension-driven flow. Other topics include vorticity and circulation, ideal fluid flow theory in two and three dimensions, Schwartz-Christoffel transformations, free streamline theory, and internal and free-surface waves.

Requisites: Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5022 (3) Classical Thermodynamics

First and second laws of thermodynamics. Entropy and availability. Cycle analysis. Thermodynamic properties of pure substances and mixtures. Property relations. Chemical reactions and chemical availability. Energy systems analysis.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5023 (3) Solid Mechanics 1

Introduces stress, strain and motion of a continuous system. Discusses material derivative; fundamental laws of mass, momentum, energy and entropy; constitutive equations and applications to elastic and plastic materials.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5012

Requisites: Requires coreq course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Solids

MCEN 5024 (3) Materials Chemistry and Structures

Provides graduate level students with a comprehensive overview of the chemistry and structure of material systems, with a focus on chemical bonding, the resulting material structures and their properties. This course is intended to become one of the four core courses offered in the new Materials Science curriculum. Course topics include: bonding in solids, crystalline and amorphous states, basic group theory, diffraction, metals and alloys, ceramics, and an intro to mat. characterization.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Materials

MCEN 5027 (1) Graduate Seminar

Offers weekly presentations by visiting speakers, faculty, and students.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

MCEN 5032 (3) Sustainable Energy

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4032

Grading Basis: Letter Grade

Additional Information: Departmental Category: Thermal

MCEN 5034 (3) Thermodynamics of Materials

Provides a unified presentation of fundamental concepts applicable to the thermodynamics of engineering materials. Develops quantitative tools for understanding the physical principles that govern phase equilibrium and transformation. Generates binary and ternary phase diagrams and determine the resulting materials structures and corresponding physical and mechanical properties.

Recommended: Prerequisites MCEN 2024 and MCEN 3012.

Additional Information: Departmental Category: Materials

MCEN 5040 (3) Methods of Engineering Analysis 2

Studies selected topics from the theory of complex variables, integral transform methods, partial differential equations, and variational methods. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

Requisites: Requires prerequisite course of MCEN 5020 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Math

MCEN 5041 (3) Advanced Fluid Mechanics 1

Highlights exact solution of Navier-Stokes equations and fundamentals of rotating fluids. Considers Low Reynolds number flow; similarity solutions; viscous boundary layers, jets, and wakes; and unsteady viscous flow.

Requisites: Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5042 (3) Heat Transfer

Studies development of equations governing transport of heat by conduction, convection, and radiation, and their solution. Includes analytical and numerical solution of initial and boundary value problems representative of heat conduction in solids. Describes heat transfer in free and forced convection, including laminar and turbulent flow. Also involves radiation properties of solids, liquids, and gases and transport of heat by radiation.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5044 (3) Mechanical Behavior of Materials

This introductory-level graduate course incorporates relevant aspects of materials science, solid mechanics, thermodynamics and mathematics, and applies them to achieve a fundamental understanding of the mechanical behavior of crystalline and non-crystalline engineering materials.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Materials

MCEN 5045 (3) Design for Manufacturability

Topics include general design guidelines for manufacturability; aspects of manufacturing processes that affect design decisions; design rules to maximize manufacturability; statistical considerations; value engineering and design for assembly (manual, robotic, and automatic). Presents case studies of successful products exhibiting Dfm.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Materials

MCEN 5055 (3) Advanced Product Design

Introduces engineering design and development of consumer products. Includes learning sketching, brainstorming, idea generation, design thinking, user-centered design, product requirements and specifications, product constraints, human factors, aesthetics, industrial design, intellectual property, concept prototyping, idea selection, tolerancing, cost estimating, design for assembly, and materials selection. Entails a semester-long team re-design of a consumer product.

Additional Information: Departmental Category: Design

MCEN 5057 (3) Environmental Modeling

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4057

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 5065 (3) Graduate Design I

First part of a two-course graduate product design experience in mechanical engineering. Covers problem definition and specifications, determining design requirements, user feedback, alternative design concepts, engineering analysis, concept prototypes, and CAD drawings. Students make several oral design reviews, a final design presentation, and prepare a written report. Entails a team product design, fabrication, and testing cycle of sponsored project.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Design

MCEN 5075 (3) Graduate Design II

Second part of two-course graduate product design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product. Entails a team product design, fabrication, and testing cycle of a sponsored project, leading to a fully-functional product.

Requisites: Requires prerequisite course of MCEN 5065 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Design

MCEN 5115 (3) Mechatronics and Robotics I

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4115

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Design

MCEN 5117 (3) Anatomy and Physiology for Engineers

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4117

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 5121 (3) Compressible Flow

Applies energy, continuity, and momentum principles to compressible flow. Topics include normal and oblique shocks; Prandtl-Meyer expansion; methods of characteristics; and one-, two-, and three-dimensional subsonic, supersonic, and hypersonic flows.

Requisites: Requires prerequisite course of MCEN 5021 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5122 (3) Statistical Thermodynamics

Axiomatic formulation of macroscopic thermodynamics. Quantum mechanical description of atomic and molecular structure. Statistical mechanics description of thermodynamic properties of gases, liquids and solids. Elementary kinetic theory of gases and evaluation of transport properties. Department enforced requisite: undergraduate thermodynamics.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5125 (3) Optimal Design

Applies linear and nonlinear optimization methods to the design of mechanical components and systems. Examines unconstrained and constrained optimizations as well as formulation of objective functions, including cost, weight, response time and deflection. Applies knowledge to gears, springs, cams and linkages.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4125

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Design

MCEN 5127 (3) Biomedical Ultrasound

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4127

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 5131 (3) Air Pollution Control Engineering

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4131

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5133 (3) Biomechanics

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4133

Additional Information: Departmental Category: Materials

MCEN 5135 (3) Wind Energy and Wind Turbine Design

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turbine and determining whether their proposal is feasible from an economic standpoint.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4135

Requisites: Restricted to Mechanical (MCEN), Civil (CVEN) or Aerospace (ASEN) Engineering graduate students only.

Additional Information: Departmental Category: Design

MCEN 5137 (3) Anatomy and Physiology 2

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4137

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 5141 (3) Indoor Air Pollution

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4141

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5151 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4151 and FILM 4200 and ARTF 5200

Additional Information: Departmental Category: Fluids

MCEN 5152 (3) Introduction to Combustion

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4152

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5154 (3) Biocolloids and Biomembranes

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4154

Recommended: Prerequisites APPM 2360 and PHYS 1120.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 5161 (3) Aerosols

Introduces atmospheric aerosols and properties of their distributions, followed by fundamental descriptions of single particle dynamics, thermodynamics, nucleation, coagulation, mass transfer and populations dynamics. During the second half of the course, the focus will shift to sources and sinks of atmospheric aerosols, their impacts on atmospheric chemistry and radiation, and the impacts of these processes on air quality and climate.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluids

MCEN 5173 (3) Finite Element Analysis

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4173

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Solids

MCEN 5174 (3) Failure of Engineering Materials

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4174

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Materials

MCEN 5183 (3) Mechanics of Composite Materials

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4183

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Solids

MCEN 5194 (3) Electrochemical Energy Conversion and Storage

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4194

Recommended: Prerequisites MCEN 2024 and MCEN 3032.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 5208 (1-4) Special Topics

Credit hours and subject matter to be arranged.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

MCEN 5228 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4228

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in College of Engineering and Applied Science or to students with 57-180 credits (Junior or Senior) or Mechanical Engineering Concurrent Degree students.

Additional Information: Departmental Category: Miscellaneous

MCEN 5236 (3) Integ Mfg Sys

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 5255 (3) Design for Mfg

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Design

MCEN 5258 (1-3) Sp Tpcs-Combustion Seminar

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Special Topics

MCEN 5636 (3) Micro-Electro-Mechanical Systems 1

Addresses issues of micro-electro-mechanical systems (MEMS) modeling, design, and fabrication. Emphasizes the design and fabrication of sensors and actuators due to significance of these devices in optics, medical instruments, navigation components, communications, and robotics. Department consent required.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 5832 (3) Special Topics

Additional Information: Departmental Category: Special Topics

MCEN 5848 (1-6) Independent Study

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. May be repeated for up to 6 total credits.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering graduate students only.

Additional Information: Departmental Category: Miscellaneous

MCEN 5858 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 5868 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 5878 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 5888 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6001 (3) Reacting Flows

Provides an introduction to reacting flows and combustion. Covers chemical kinetics, including global and detailed mechanisms and the variable density flow equations are derived. Relevant non-dimensional parameters and limiting behaviors are discussed. The Rankine-Hugoniot relations are presented and various aspects of diffusion, kinetically dominated and balanced combustion are outlined. Flame structures are discussed, including laminar and turbulent flames, and the Burke-Schumann solution is outlined. The turbulent forms of the motion equations are derived, and the reactive scalar transport equation and mixture fraction variable are presented. The flamelet progress variable approach is outlined, including a comparison of steady and unsteady flamelet models. Specific topics in spray combustion, triple flames, solid-gas reactors and detonations are discussed.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 6001

Requisites: Requires prerequisite course of MCEN 5021 (minimum grade C-). Restricted to College of Engineering and Applied Science graduate students or BS/MS Concurrent Degree Students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Fluids

MCEN 6184 (3) Structure and Properties of Polymers

Emphasizes the relationship between molecular structure and macroscopic properties. Structural aspects include chain conformation, configuration, and the crystalline and amorphous states. Discusses physical and mechanical properties with a focus on solution and phase behavior, transitions of bulk polymers, and rubber and viscoelastic behavior. Requires background in basic material science and polymer related concepts.

Requisites: Restricted to College of Engineering graduate students only.

Additional Information: Departmental Category: Materials

MCEN 6228 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Special Topics

MCEN 6800 (3) Master of Engineering Project

Additional Information: Departmental Category: Math

MCEN 6848 (1-6) Independent Study

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

MCEN 6858 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6868 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6878 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6888 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6949 (1) Master's Degree Candidacy

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Thesis

MCEN 6959 (1-6) Master's Thesis

Additional Information: Departmental Category: Thesis

MCEN 7221 (3) Turbulence

Hydrodynamic stability theory, equations for turbulent flows, free shear flows and boundary layers, homogeneous and isotropic turbulence, overview of turbulent combustion, reaction kinetics, energy equation, Favre averaging, Pdfs, premixed and nonpremixed flame modeling, and recent developments.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 7228 (3) Special Topics

Additional Information: Departmental Category: Special Topics

MCEN 8999 (1-10) Doctoral Thesis

Additional Information: Departmental Category: Thesis

Mechanical Engineering - Master of Engineering (ME)

The Master of Engineering degree in mechanical engineering is only awarded as part of a dual degree with the Master of Engineering in engineering management (p. 1247).

The dual degree prepares engineers, applied scientists and technical professionals for early and mid-career assignments in leadership and management. Students will gain high-level technical expertise from award-winning mechanical engineering faculty. Students will also learn from engineering management experts in areas such as quality management, new product development, management of research and development, applied research and leadership. The faculty teaching in engineering management have extensive professional experience, working with Fortune 500 technology organizations as well as with small, entrepreneurial companies.

For more information, visit the department's Dual Degree MechE & Eng. Mgmt. (<http://www.colorado.edu/mechanical/current-students/graduate/dual-degree-meche-eng-mgmt>) webpage.

Requirements

Students must first be admitted into the mechanical engineering degree program and complete at least 30 credit hours of course work at the 5000-level or above.

Course work must include 18 credit hours of courses in mechanical engineering; 12 credit hours of courses in other engineering fields, science, business, etc.; and attendance is required at a select number of mechanical engineering graduate seminars.

Next, students must be admitted into the engineering management degree program and complete an additional 15 hours of graduate engineering management course work.

For more information, visit the department's Dual Degree MechE & Eng. Mgmt. webpage.

Mechanical Engineering - Master of Science (MS)

The Master of Science (MS) is a degree program that is well suited for students pursuing a career in academia or industry with a research component. The curriculum follows the department's research focus areas: air quality, bioengineering, materials, mechanics of materials, micro/nanoscale, robotics and systems design, and thermo fluid sciences. With support from the research advisor, students in this program have the option of smoothly transitioning in the PhD program.

If a student plans to earn a master's degree and then immediately continue on to a PhD, they can apply directly to the PhD program (p. 1260); it is not necessary to earn a master's degree separately.

For more information, visit the department's Master of Science (MSME) (<http://www.colorado.edu/mechanical/current-students/graduate/master-science-msme>) webpage.

Concurrent Degree Program BS/MS in Mechanical Engineering

The Master of Science degree in mechanical engineering is also available to undergraduate mechanical engineering majors through a concurrent degree program. For more information, visit the department's BS/MS (<http://www.colorado.edu/mechanical/current-students/graduate/bsms>) webpage.

Requirements

The mechanical engineering Master of Science (MS) curriculum is designed to provide a balance between a modern technological focus and disciplinary depth.

Students must complete at least 30 graduate-level credit hours, to include at least 15 credits (five courses, including the 3–5 required core courses) in mechanical engineering. Up to 9 credits (three courses) may be taken outside of the department.

Students must also complete 6 credits of thesis work. Students must secure a thesis advisor for research and course guidance, and students must attend a select number of mechanical engineering graduate seminars.

For more information, visit the department's MS - Thesis Option (<http://www.colorado.edu/mechanical/current-students/graduate/master-science-msme/ms-thesis-option>) webpage.

Mechanical Engineering - Professional Master of Science (MSME)

The Master of Science (MSME) is a degree program that offers possibilities for a wide range of prospective students. Whether a prospective student is a working engineer or an undergraduate considering a career in industry, this department has program options to meet their needs.

A thesis is not required to earn this degree. If a student plans to earn a master's degree and then immediately continue on to a PhD, they can apply directly to the PhD program (p. 1260); it is not necessary to earn a master's degree separately.

For more information, visit the department's Master of Science (MSME) (<http://www.colorado.edu/mechanical/current-students/graduate/master-science-msme>) webpage.

Concurrent Degree Program BS/MS in Mechanical Engineering

The Master of Science degree in mechanical engineering is also available to undergraduate mechanical engineering majors through a concurrent degree program. For more information, visit the department's BS/MS (<http://www.colorado.edu/mechanical/current-students/graduate/bsms>) webpage.

Requirements

Students must complete at least 30 graduate-level credit hours (10 courses), to include at least 18 credits (six courses) in mechanical engineering. Up to 12 credits (four courses) may be taken outside of the department.

Students must attend a select number of mechanical engineering graduate seminars. A thesis is not required for this degree.

For more information, visit the department's Master of Science (MSME) (<http://www.colorado.edu/mechanical/current-students/graduate/master-science-msme>) webpage.

Mechanical Engineering - Doctor of Philosophy (PhD)

Mechanical engineering PhD students at CU Boulder take part in cutting edge, tier-one research, learning from nationally and internationally recognized faculty.

Our research harnesses state-of-the-art experimental, theoretical and computational approaches to expand the frontiers of technology, while advancing fundamentals in the underlying disciplines of fluid and solid mechanics, thermal engineering and materials science and engineering.

PhD students choose from focus areas in air quality, bioengineering, materials, mechanics of materials, micro/nanoscale, robotics and systems design, and thermo fluid sciences.

The PhD program in mechanical engineering is available to students entering graduate studies for the first time as well as those who already have a master's degree. While a master's is not required to enroll, our PhD students will typically earn one on the way to a PhD. The best way to do that is by following an MS thesis curriculum (see the department's Master of Science - Thesis Option (<http://www.colorado.edu/mechanical/prospective-students/graduate/master-science-thesis-option>) webpage).

PhD students consult with a faculty advisor throughout the duration of their degree to review their research progress and course selection.

For more information, visit the department's PhD (<http://www.colorado.edu/mechanical/prospective-students/graduate/phd>) webpage.

Requirements Course Requirements

The PhD requires 30–42 credit hours of course work in courses numbered 5000 or above, with a minimum GPA of 3.25, plus 30 credit hours of dissertation credit.

A maximum of 21 credit hours of graduate course work may be transferred from another accredited institution. All courses taken for the master's degree at the 5000 level or above at CU Boulder may be applied toward the doctoral degree at the university.

For more information, visit the department's PhD (<http://www.colorado.edu/mechanical/prospective-students/graduate/phd>) and Focus Areas (<http://www.colorado.edu/mechanical/research/focus-areas>) webpages.

Preliminary Examination

Every student desiring to pursue the PhD degree must pass a preliminary examination. As a part of this evaluation, students must pass a written math examination, as well as two oral examinations designed to test research and fundamental mechanical engineering competency. Students must also pass a research presentation given to a committee of at least three faculty members. Overall performance in the required examinations will determine pass/fail status.

Comprehensive Examination

After passing the preliminary examination, students continue their course work and prepare a written thesis prospectus. When ready, they take an oral comprehensive examination covering the graduate course work and the thesis prospectus. The oral examination is based primarily on a written proposal for the thesis research provided by the student to committee members in advance. This examination is conducted before the student's doctoral committee of five or more graduate faculty members chosen by the student and approved by the department and the Graduate School.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Time Limit

All requirements for the mechanical engineering PhD must be completed within six years of the date of commencing course work.

Technology, Media and Society

ATLAS graduate studies in technology, media and society are highly interdisciplinary. The doctoral program caters to self-motivated inventors and investigators whose interests fall outside the scope of traditional disciplinary programs. Students admitted to the PhD program hold a wide range of degrees, including electrical engineering, education, journalism, music, computer science, art history, physics, and library science.

Attracting similarly diverse students, the master's program includes tracks in creative technologies and design (CTD), and information and communication technology for development (ICTD). The studio-based CTD track invites student artists, designers, engineers and scientists to blend technical skills with creative exploration to realize their creative visions, preparing them for a wide gamut of careers in design, technology and the creative arts. The related ICTD track develops students' technical skills, critical thinking, and creative problem solving as they seek to address needs such as access, social equity, public policy, and sustainability in developing countries and underserved domestic communities.

For more information, visit the institute's Technology, Media and Society Graduate Programs (<http://atlas.colorado.edu/programs>) webpage.

Course code for this program is ATLS.

Professional Master's Degree

- Technology, Media and Society - Master of Science (MS) (p. 1263)

Doctoral Degree

- Technology, Media and Society - Doctor of Philosophy (PhD) (p. 1265)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bethancourt, Matthew Robert (https://experts.colorado.edu/display/fisid_156489)

Instructor; MFA, New School For Social Research

Dupre, Jill VanMatre (https://experts.colorado.edu/display/fisid_144395)
Scholar In Residence/Scholar In Residence; JD, University of Colorado Boulder

Gross, Mark D (https://experts.colorado.edu/display/fisid_100095)
Professor; PhD, Massachusetts Institute of Technology

Hales, Ian W (https://experts.colorado.edu/display/fisid_134701)
Instructor; MS, University of Denver

Hoth, Kevin J. (https://experts.colorado.edu/display/fisid_149219)
Instructor; MFA, University of Washington

Pierce, Aileen Jaitin (https://experts.colorado.edu/display/fisid_134704)
Senior Instructor

Schaal, David Andrew (https://experts.colorado.edu/display/fisid_114824)
Instructor; MFA, University of Colorado Boulder

Shapiro, Ryan Benjamin (https://experts.colorado.edu/display/fisid_156418)

Assistant Professor/Assistant Professor; PhD, Northwestern University

Swanson, Joel E. (https://experts.colorado.edu/display/fisid_134311)
Assistant Professor; MFA, University of California-San Diego

Szafir, Daniel James (https://experts.colorado.edu/display/fisid_156420)
Assistant Professor; PhD, University of Wisconsin-Madison

Theodore, Michael (https://experts.colorado.edu/display/fisid_113318)
PhD, University of California-San Diego

Courses

ATLS 5120 (3) Mobile Application Development

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4120

Grading Basis: Letter Grade

ATLS 5150 (1) Managing Effectively in a Changing Telecommunications Environment

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5150

ATLS 5210 (3) Global Development I

Introduces students to the theories and policy of international development. Examines the role of multilateral agencies, foundations, aid organizations, corporate entities and academia in development as both an industry and a research field. Focuses on development movements and their outcomes, the inter-related nature of development and its effect on policies and programs, and critiques.

Requisites: Restricted to graduate students only.

ATLS 5214 (3) Big Data Architecture

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4214

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade D-). Restricted to Computer Science (CSEN) graduate students only.

Grading Basis: Letter Grade

ATLS 5220 (3) Global Development II

Explores the impact of economic, geographical and social/cultural conditions on development outcomes through standalone course components taught by subject matter experts in region and in residency at ATLAS. Components may include, but are not limited to, development economics, environmental sustainability, public health, climate change, globalization and migration, religion, and gender as these broad themes relate to development.

Requisites: Requires prerequisite courses of ATLS 5210 (minimum grade D-). Restricted to graduate students only.

ATLS 5230 (3) Case Studies in Information and Communication Technology for Development

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4230

Requisites: Restricted to graduate students only.

ATLS 5240 (3) Information and Communication Technology for Development Laboratory

Prepares students for the semester-long practicum. Students work in teams to design ICTD interventions that address unique socio-economic and environmental development issues. Teams will design a variety of ICTD interventions, including telehealth and distance education programs, communication networks, and pro-development ICTD policies. Topics will be chosen by teams and guided by program faculty and external domain experts.

Requisites: Requires prerequisite courses of ATLS 5230 (minimum grade D-). Restricted to graduate students only.

ATLS 5250 (3) Fieldwork Methods for ICTD Practitioners

Introduces methods and models that can be employed in ICTD program development and deployment. Examines the applications of participatory research, value-centric design, program scale, cross-disciplinary work, and appropriate monitoring and evaluation. The goal is to build student confidence around existing evaluation toolkits and methods, while advancing multi-method approaches to designing and analyzing ICTD initiatives.

Requisites: Restricted to graduate students only.

ATLS 5380 (3) Future of Video: Technology, Policy, and Economics

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5380

Requisites: Requires prerequisite courses of TLEN 5210 (minimum grade D-). Restricted to graduate students only.

ATLS 5519 (1-3) Advanced Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATLS 5529 (1-3) Advanced Special Topics: Critical Perspectives in Technology

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4529

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade D-). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 5610 (6) Startup Practicum

Presumes that entrepreneurship can be learned through the conception, build, and launch of an original product or service by student teams within a single semester. Immerses students in the daily leadership and innovation challenges of the startup environment and serves as a clinic in thinking, decision making and mental agility that will benefit any area of business—not just startups.

Requisites: Restricted to graduate students only.

ATLS 5620 (3) User Centered Design 1

Emphasizes that user-centered design is the first and primary consideration in the design process. UCD teaches how to design successful interactions from research into users' behaviors, attitudes and expectations via three key elements to designing successful user experiences: 1) Listen, Observe, and Research; 2) Concept and Design for Your Users; 3) Deliver/Launch.

Requisites: Restricted to graduate students only.

ATLS 5630 (3) Front-End Development

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4630

Requisites: Restricted to graduate students only.

ATLS 5640 (4) Design Thinking

Explores design thinking and how it can be applied conceptually and practically to innovation in areas as diverse as business organization and product development to topics and areas including but not limited to, story, design, UX, interaction design, communication strategy and presentation. Fast-paced, project-based, and immersive, students will work in small teams to discover solutions to real-world problems.

Requisites: Restricted to graduate students only.

ATLS 5650 (3) Introduction to Programming

Provides a hands-on introduction to programming logic, environments, and execution using Ruby as the primary programming language. Covers basic programming principle, syntax, design patterns, and best industry practices while focusing on developing elegant, problem-solving skills through code.

Requisites: Restricted to graduate students only.

ATLS 5660 (3) Creative Code

Exposes students to front-end, web-based design and development processes and best practices. WordPress will be used as the back end CMS. Students will learn how to design and develop using WordPress as a framework. At the end of the semester, students will present a final project to illustrate what they have learned and the logic of their build.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites: exposure to HTML, CSS, JavaScript, PHP and MySQL and previous experience with WordPress for blogging and/or content publication.

ATLS 5670 (3) Content Strategies

Experiments with different frameworks on how to combine messaging with creative to communicate complex ideas, brand story, product, and finally measure success. Gain experience and expertise with the various content types and channels, with an understanding of how to apply them and the capabilities to do so in solving creative and business problems.

Requisites: Restricted to graduate students only.

ATLS 5680 (3) Creative Tech Studio

Emphasizes fundamentally, theoretically, and practically that technology and creativity are not opposing disciplines but rather a dynamic and complementary blending of idea and execution that is iterative and evolving through the dynamic exchange and interaction of ideas and tools. Each Studio will offer a different conceptual challenge, such as using technology to bridge physical and digital environments, game design, or storytelling.

Repeatable: Repeatable for up to 12.00 total credit hours.

Grading Basis: Letter Grade

ATLS 5720 (3) User-Centered Design 2

Expands on techniques and opportunities presented in User-Centered Design 1 with a deeper dive into research and prototyping practices as means to insight into user desires and preference, adoption, and execution of product and branded experiences in a variety of contexts and locations within the global experience economy.

ATLS 5730 (3) Front-End Development 2

Requires that students are proficient in front-end environment and ready for advanced front-end development using these tools - HTML 5, CSS3, JS - on weekly projects, a mid-term project, and a final project. This course develops more robust and elegant uses of the semantic use of elements as well as the benefits of using standards-based, valid code, CSS efficiencies, and JS and its libraries.

ATLS 5740 (3) Design Thinking 2

Presents visual thinking as a complex process that can be supported in every stage using specific design techniques. Provides practical, task-oriented information for designers and software developers charged with design responsibilities, including examples of integrated text and full-color data stories, all of which are robust in principles of "active vision," viewing graphic designs as cognitive tools.

ATLS 5809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4809 and CSCI 4809 and CSCI 5809

Requisites: Restricted to graduate students only.

ATLS 5900 (1-6) Masters Level Independent Study

Provides opportunities for independent study and research at the Masters level. Students work on research project guided by faculty.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATLS 6519 (1-3) Advanced Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATLS 6910 (3-6) Information and Communication Technology for Development Practicum

This practicum allows MS-ICTD students to synthesize what they have learned and test their readiness for a career in ICTD. Practicum assignments are arranged under the supervision of the MS-ICTD Program Director and involve work with a non-governmental organization, development agency or technology/policy entity. Successful completion is required for graduation from the MS-ICTD Program.

Requisites: Requires prerequisite courses of ATLS 5210 and ATLS 5220 and ATLS 5230 and ATLS 5240 and ATLS 5250 (all minimum grade D-).

ATLS 7000 (1) ATLAS Seminar

This student/faculty seminar critically examines issues in technology, media and society from the multiple interdisciplinary perspective of the gathered participants. Topics may include: IT and business, security, ethics, globalization, digital divide, IT and education, human computer interaction and others. Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

ATLS 7800 (2) Online Course Design for the Foreign Languages

Learn about the challenges and affordances of designing online foreign languages courses. Read research articles and book chapters pertaining to instructional design issues and online teaching strategies. Experiment with the latest forms of educational technologies. Students enrolled in the course will design and teach a two-week online language course. Department enforced prerequisite: two years of language teaching experience at the college level.

Grading Basis: Pass/Fail

ATLS 7900 (1-6) Doctoral Level Independent Study

Provides opportunities for independent study and research at the Doctoral level. Students perform independent research under faculty supervision.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Atlas (ATLS) graduate students only.

ATLS 8990 (1-10) Doctoral Dissertation

Approved research conducted under the supervision of members of the graduate faculty. Investigates some specialized topic or field in the area of interdisciplinary information and communication technology. All doctoral students must register for at least 30 hours of dissertation credit as part of the requirement for the ATLAS doctoral degree.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Atlas (ATLS) graduate students only.

Technology, Media and Society - Master of Science (MS)

For more information, visit the ATLAS Institute's Technology, Media and Society Graduate Programs (<http://atlas.colorado.edu/programs>) webpage.

Program Tracks

The professional master's degree (MS) in technology, media and society includes two program tracks.

Information and Communication Technology for Development (ICTD) Track

The ICTD track prepares students to leverage information and communication technology in support of underserved communities in the U.S. and around the world.

Creative Technologies and Design (CTD) Track

The CTD track prepares students for careers in a wide range of fields at the intersection of design and technology. The CTD track offers a transdisciplinary curriculum that integrates technology skills with a critical, theoretical and historical understanding of technology, media and the arts.

Requirements

Program Tracks

Information and Communication Technology for Development (ICTD)

The ICTD track requires a total of 33 credit hours (including courses and a 6-credit-hour practicum), of which at least 27 must be completed at the 5000 level or above. In addition, specific focus area requirements must be met. Students must receive a grade of B or higher in all course work, maintaining a minimum overall GPA of 3.000.

Two-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
ATLS 5230	Case Studies in Information and Communication Technology for Development	3
ATLS 5210	Global Development I	3
Technology elective 1		3
	Credit Hours	9
Spring Semester		
ATLS 5250	Fieldwork Methods for ICTD Practitioners	3
Policy or business elective		3
Technology elective 2		3
	Credit Hours	9
Year Two		
Fall Semester		
ATLS 5240	Information and Communication Technology for Development Laboratory	3
Domain-specific elective		3
Technology elective 3		3
	Credit Hours	9

Spring Semester		
ATLS 6910	Information and Communication Technology for Development Practicum	6
	Credit Hours	6
	Total Credit Hours	33

For more information, visit the MS-TMS Information and Communication Technology for Development (<http://atlas.colorado.edu/programs/ictd-track>) webpage.

Creative Technologies and Design (CTD)

The CTD track requires a total of 33 credit hours, of which at least 27 of which must be completed at the 5000 level or above. Students must complete the 3-credit-hour thesis course. In addition, specific focus area requirements must be met. Students must receive a grade of B or higher in all course work, maintaining a minimum overall GPA of 3.000.

Two-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (CTD Professional Seminar: Industry Engagement)	3
ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio)	3
Creative Technologies*		3
	Credit Hours	9
Spring Semester		
ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio)	3
Critical Perspectives		3
Praxis elective 1		3
	Credit Hours	9

Year Two

Fall Semester

ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Critical Issues in CTD)	3
ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio)	3
Praxis elective 2		3
		Credit Hours 9

Spring Semester

ATLS 5519	Advanced Special Topics in Technology, Arts, and Media (Design Studio) ¹	3
CTD Thesis Project		3
		Credit Hours 6
		Total Credit Hours 33

¹ Or praxis elective 3.

For more information, visit the MS-TMS Creative Technologies and Design (<http://atlas.colorado.edu/programs/ctd-track>) webpage.

Technology, Media and Society - Doctor of Philosophy (PhD)

The interdisciplinary ATLAS PhD program in technology, media and society attracts highly motivated inventors and investigators with interests at the intersections of technology, media and society that are not met by traditional disciplinary PhD programs. Students come from all fields, including electrical engineering, education, journalism, music, computer science, art history, physics and library science.

The ATLAS PhD program is research-based: each student must pass a qualifying examination, propose a field of study, carry out a research project and defend the resulting dissertation.

The program emphasizes out-of-the-box invention and radical investigation. We are looking for people who want to improve the world through technology, who aren't afraid to think beyond conventional wisdom, and who have or are prepared to gain the technical expertise to carry out their vision.

For more information, visit the ATLAS Institute's PhD Program (<http://atlas.colorado.edu/programs/ph-d-program>) webpage.

Requirements

Course Requirements

- A minimum of 30 credit hours of courses numbered 5000 or above where students earn a minimum of 3.00 GPA.
- A minimum of 30 credit hours of dissertation credit are required for the degree.
- Students must complete at least one qualitative and one quantitative or other methods course, which may be taken in a variety of departments.

Program Proposal

To maintain good standing in the program, all students must complete their academic program plan/program proposal by the end of the second semester. In general, ATLAS academic plan/program proposals include general research area and the courses to be taken and other research/disciplinarily appropriate activities planned.

Preliminary Examination

To maintain good standing in the program, all students must complete their preliminary examination by the end of the second year. The preliminary examination will demonstrate the student's preparation for scholarly work in his/her chosen area. Generally, this is a 3–5 page document that is approved by the advisor and the ATLAS graduate committee.

Comprehensive Examination

To maintain good standing in the program, all students must complete their comprehensive exam by the end of the second semester of their fourth year in the program. The comprehensive examination will outline the student's completed research and proposed research agenda. This includes both an oral and written exam delivered to their dissertation committee and open to the larger community.

PhD Dissertation

Students must write a dissertation based on original research conducted under the supervision of a graduate faculty member. The dissertation must fulfill all CU Boulder Graduate School requirements. After the dissertation is completed, an oral final examination on the dissertation and related topics is conducted by the student's doctoral committee.

Telecommunications

The interdisciplinary telecommunications program (ITP) offers to students the skills that allow them to master not only the latest technologies associated with the Internet, but also the business skills and policy knowledge essential to achieving success in the companies driving today's rapidly changing high-tech world. Within ITP, students can develop expertise in the growing fields of cybersecurity, wireless, network engineering and telecommunications policy and strategy. We offer hands-on experience in our world-class labs equipped with state-of-the-art technologies.

ITP also offers graduate certificates, where students gain a foundation of knowledge and skills focusing on a specific technology, as well as best practices and tools immediately applicable to the work environment. Graduate certificates aid the development or enhancement of a specialized expertise. Certificates also provide the flexibility to allow course credit hours to be applied toward a master's degree.

For more information, visit the Interdisciplinary Telecom Program (<http://www.colorado.edu/itp>) website.

Course code for this program is TLEN.

Master's Degree

- Telecommunications - Master of Science (MS) (p. 1270)

Doctoral Degree

- Telecommunications - Doctor of Philosophy (PhD) (p. 1273)

Certificates

- Computer and Network Security - Graduate Certificate (p. 1273)
- Network Architecture - Graduate Certificate (p. 1274)
- Telecom Policy and Strategy - Graduate Certificate (p. 1274)
- Wireless Networks and Technologies - Graduate Certificate (p. 1274)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Bennett, John Knox (https://experts.colorado.edu/display/fisid_116933)
Professor; PhD, University of Washington

Cook, Charles I (https://experts.colorado.edu/display/fisid_149148)
Lecturer

Dehus, Mark D (https://experts.colorado.edu/display/fisid_146046)
Lecturer; MS, University of Colorado Boulder

Grunwald, Dirk C (https://experts.colorado.edu/display/fisid_102261)
Professor; PhD, University of Illinois at Urbana-Champaign

McManus, Joseph E (https://experts.colorado.edu/display/fisid_152168)
Scholar In Residence; MS, Carnegie Mellon University

Mickelson, Alan R (https://experts.colorado.edu/display/fisid_100286)
Associate Professor; PhD, California Institute of Technology

Nettleton, Ray W. (https://experts.colorado.edu/display/fisid_125678)
Assoc Professor Adjunct; PhD, Purdue University

Ohm, Paul K (https://experts.colorado.edu/display/fisid_142996)
Associate Professor; JD, University of California-Los Angeles

Perigo, Levi D. (https://experts.colorado.edu/display/fisid_155562)
Scholar In Residence; PhD, Nova University

Reed, David Palmer (https://experts.colorado.edu/display/fisid_152458)
Scholar In Residence; PhD, Carnegie Mellon University

Santos, Jose Ramon (https://experts.colorado.edu/display/fisid_124623)
Senior Instructor; MS, University of Colorado Boulder

Schwengler, Thomas (https://experts.colorado.edu/display/fisid_143850)
Lecturer

Courses

TLEN 5010 (3) Network Economics and Finance I

Introduces students to the fundamental theoretical framework and tools used by economists to examine decision making under scarcity. Reviews mathematical economics and models. Examines consumer choice and firm supply. These two aspects of the market are brought together to examine how price and output are determined in competitive and imperfectly competitive markets. Introduces financial economics, network effects and public goods.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5050 (3) Leading Oneself

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

Equivalent - Duplicate Degree Credit Not Granted: EMEN 5050

Requisites: Restricted to Leeds School of Business or College of Engineering graduate students only.

TLEN 5106 (3) International Deployment of Broadband Networks

Evaluates the business potential for deploying fixed or mobile broadcast networks in an international context. Guides students to develop financial statements to evaluate the investment potential of the venture. Covers: strategy, market potential, sales channels, costs, regulatory and financial issues all in an international context. Project teams mimic the matrix structure of working teams in business context and present to an investor their recommendations.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5130 (3) Telecommunications Business Strategy

Covers concepts, strategies, and practical implementation of market oriented business strategy in the telecom industry grounded with real world examples. Topics include positioning, segmentation/ targeting, technology adoption, advertising/outreach, communication strategies, product management, sales process and business intelligence.

Requisites: Requires prerequisite course of TLEN 5010 (minimum grade D-). Restricted to graduate students only.

TLEN 5150 (1) Managing Effectively in a Changing Telecommunications Environment

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5150

TLEN 5190 (3) Standardization and Standards Wars

Examines current issues and strategy in the standardization of telecommunications and information technologies. Covers topics on the importance of standards, government and private sector perspectives, and impact of information age technologies on standards development. Introduces students to relevance of antitrust and intellectual property law to the topic.

TLEN 5210 (3) Principles of Telecommunications Policy

Learn the key issues and principles that guide the decisions of policy makers with respect to the regulatory treatment of voice, video and data communications. Engage in critical debate, and develop instincts for anticipating the likely regulatory models that may be applied to new technologies. This introductory course covers technical, economic, legal, political and institutional considerations.

Requisites: Requires prerequisite course of TLEN 5010 (minimum grade D-).

TLEN 5230 (3) Spectrum Management and Policy

Studies how spectrum policy is developed and implemented. A general framework is developed for understanding telecommunications law and regulatory objectives. Specifically analyzes international and domestic dimensions of spectrum policy. Considers how economics, administrative processes and innovative technologies affects management of the spectrum.

TLEN 5240 (3) Telecommunications Law and Policy

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7241

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5245 (3) Introduction to Intellectual Property Law

Provides an overview of our nation's intellectual property laws, including patent, copyright, trademark, trade secret and also discusses other assorted matters related to intellectual property, including licensing, competition policy issues and remedies.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6301

TLEN 5250 (2-4) Technology Law and Policy Clinic

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7809

Grading Basis: Letter Grade

TLEN 5265 (3) Copyright

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7301

Requisites: Restricted to graduate students only.

TLEN 5300 (1-3) Telecommunications Theory and Applications

Examines the mathematical and physical theory of telecommunications. Deals with the fundamental concepts related to a wide range of topics including physical units, numbering systems, trigonometric functions, logarithms, indices, decibels, complex numbers, calculus, elementary probability, and power circuit analysis.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5310 (3) Telecommunications Systems

Reviews fundamental technical concepts and terminology in telecommunications. Topics of focus include: decibels, noise analysis, transmission lines, electronic signals, radio spectrum characteristics, link budgets, AM modulation, angle modulation, digital modulation, multiplexing, sampling and digital encoding, detection, and similar physical layer concepts. Systems for analysis include CATV, cellular wireless, WLAN, satellite systems, internet networking and related voice and data networks.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5330 (3) Data Communications 1

Provides a comprehensive technical survey of data and computer communications including Wireless, LAN, MAN, and WAN systems and standards. Covers packet switching, internetworking, addressing, routing, transport layers, TCP/IP internet, wired and wireless LAN technologies, congestion control and flow control schemes.

Requisites: Restricted to ITP (TLEN-MS) students only.

TLEN 5340 (3) VOIP Network Design

Focuses on VoIP network design and optimization. The emphasis is on the convergence of VoIP, PSTN and cell phone networks and signaling. Topics include voice processing as well as IP and SS7 signaling. In addition there will be a review of ISDN, DSL, Sonet, ATM, SIP and MPLS. There will be a case problem for sizing a VoIP network using silence suppression.

Requisites: Requires corequisite course of TLEN 5310. Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5350 (3) Commercial Spaceflight Operations and Communications

Aimed at a high level fundamental understanding of broadcasting, communication and navigation satellite systems. Topics include orbital mechanics, orbit selection, spacecraft subsystems, spacecraft and earth station configurations, propagation issues, link budgets, modulation and multiplexing techniques, multiple access schemes (FDMA, TDMA, CDMA), error control coding, satellite network architecture, and economic, regulatory and business issues in Geo, Meo, and Leo systems.

Requisites: Requires corequisite course of TLEN 5330. Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5370 (3) IP Routing Protocols

Breaks IP routing technologies into two fundamental pieces: an in-depth study of interior and then exterior gateway protocols. Department consent is required.

Requisites: Requires prerequisite course of TLEN 5330 (minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5380 (3) Future of Video: Technology, Policy, and Economics

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5380

Requisites: Requires prerequisite courses of TLEN 5210 (minimum grade D-). Restricted to graduate students only.

TLEN 5410 (3) Network Management and Operations

Offers students a hands-on experience programatically managing network hardware and essential network services such as DHCP, DNS, ARP, FTP, Telnet, HTTP, SSH, SMTP, TFTP, and SNMP through the use of cross-platform scripting. Students with little or no programming experience will learn scripting by replicating functionality provided in common management suites such as HP OpenView, Nagios, Zennos, IBM Netview and others. Department consent required.

Requisites: Restricted to graduate students only.

TLEN 5430 (3) Data Communications 2

Provides a detailed technical study of Internet and Internet-related protocols following a top-down approach through the protocol stack. Bit-level analysis of a large number of Internet and Internet-related protocols, including the study of classic protocol suite principles. Covers real time and near real-time data streaming, IP mobility, IPV6, and an introduction to Internet security.

Requisites: Requires prerequisite course of TLEN 5330 (minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5438 (3) Internet Lab

Have you ever wondered how the Internet actually works? This course teaches students simple, hands-on understanding of the technical components and challenges of providing Internet Services to everyday users. This is the ideal course for technical or non-technical students who have a passion for the Internet or need to have a more detailed understanding of the Internet within their career.

Grading Basis: Letter Grade

TLEN 5460 (3) Telecommunication Systems Laboratory

Provides direct experience with telecommunications functions and equipment through experiments and demonstrations. Student teams learn the fundamental techniques of signal transmission and impairment measurement, voice and data switching, and systems administration, and the fundamental functions of data networking and services. Each experiment is designed to focus on some particular aspect of system management, development, or maintenance for either enterprise telecommunications customers or telecommunication service providers. Procedures require the use of actual commercial equipment, services, observation, reporting of behavior, and performance, compared to specified requirements. Student teams and laboratory periods for the semester are established during the first class lecture meeting. Department consent required.

Requisites: Requires prerequisite courses of TLEN 5310 and TLEN 5330 (all minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5462 (3) Datacenter Networks

Presents advanced networking techniques through experiments with network measurement equipment, switches, routers, and management interfaces. Each experiment focuses on some particular aspect of system management, development, or maintenance. Procedures require the use of actual commercial equipment, services, observation, reporting of behavior, and performance, compared to specified requirements.

Requisites: Requires prerequisite course of TLEN 5460 (minimum grade D-). Restricted to graduate students only.

TLEN 5490 (3) Network Programming

Exposes students to Unix/Linux systems and network programming with an emphasis on practical programming problems and experience. Covers the unique challenges of programming distributed systems including resolving synchronization, threads, pipes, sockets, and other constructs for building TCP/IP network servers and clients.

TLEN 5510 (3) Wireless and Cellular Communications

Presents in detail the technologies and architectures employed in cellular and other modern wireless systems and discusses regulatory and other industry issues. Major topics include radio technology, multiple access techniques, analog and digital cellular telephony, and personal communications systems.

Requisites: Requires prerequisite course of TLEN 5310 (minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5520 (3) Wireless Local Area Networks

Examines small-scale wireless networks particularly personal and local area networks. Covers licensed and unlicensed spectrum, indoor and small-scale radio propagation, modulation techniques, network topologies, ad hoc and infrastructure networks, protocol design, TCP/IP-wireless interactions and protocol standards.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5122

Requisites: Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

Recommended: Prerequisite TLEN 5430.

TLEN 5530 (3) Applied Network Security

Examines the critical aspects of network security. a technical discussion of threats, vulnerabilities, detection, and prevention is presented. Issues addressed are cryptography, firewalls, network protocols, intrusion detection, security architecture, security policy, forensic investigation, privacy, and the law.

Requisites: Restricted to graduate students only.

TLEN 5540 (3) Network Security Laboratory

Applies what students have learned in computer and network security foundations in a simulated network environment. Topics to be covered include: system hardening, firewalls, intrusion detection, vulnerability assessment, and investigation.

Recommended: Prerequisite TLEN 5530 and operating system experience.

TLEN 5550 (3) Computer and Network Security

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6268

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 5273 and significant experience in coding (C or C++) and some experience in networks and familiarity with TCP/IP, UDP and ICMP.

TLEN 5560 (3) Wireless Systems Laboratory

Serves as hands-on exploration of wireless communication systems. Designed to complement TLEN 5510 and TLEN 5520 by taking several subjects to greater depth. Students will work with, and in some cases build, radio frequency test equipment, transmitters, receivers, antennas and wireless communication systems.

Requisites: Requires prerequisite course of TLEN 5310 (minimum grade D-). Restricted to graduate students only.

Recommended: Corequisite TLEN 5510 or TLEN 5520.

TLEN 5570 (3) IP Network Design

Implement fundamentals of IP Routing Protocols and apply them directly to design based networking problems. Design scenarios will incorporate physical and logical design, financial analysis, and laboratory configuration.

Requisites: Requires prerequisite course of TLEN 5370 (minimum grade D-). Restricted to graduate students only.

TLEN 5600 (1) Telecommunications Seminar

Provides a series of weekly lectures with questions and discussion. Many of the speakers are nationally known experts in telecommunications.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5700 (2) Research Methods

Develop basic concepts and methods for pursuing quantitative and qualitative research. Students will develop a research proposal that will be completed in TLEN 5710 or as a Master's Thesis. Writing skills test required.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5710 (1-3) Capstone

Complete Capstone research project initiated in TLEN 5700.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires prerequisite course of TLEN 5700 (minimum grade D-). Restricted to graduate students only.

TLEN 5830 (1-6) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

TLEN 5831 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

TLEN 5832 (1-4) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

TLEN 5833 (2-3) Special Topics

Repeatable: Repeatable for up to 3.00 total credit hours.

TLEN 5834 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

TLEN 5835 (2-3) Special Topics

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5836 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

TLEN 5840 (3) Voice Over IP Lab: Voice Network Design and Implementation

Provides an in-depth immersion into the foundational theories and technologies of Voice Over IP (VoIP), and direct experience with real-world, hands-on lab experiments and demonstrations. In this class students will learn the fundamentals of voice technologies, services and tools used in industry to design, deploy and troubleshoot VoIP networks.

Grading Basis: Letter Grade

TLEN 5841 (3) Secure Web Application Development

Learn to develop and protect secure applications for web and mobile. Students will develop in a production cloud environment mirroring industry trends. Techniques to resist attackers and increase situational awareness will be covered. The class culminates with an end of semester project applying secure coding techniques to build a secure web application from start to finish.

Grading Basis: Letter Grade

TLEN 5842 (3) Linux Systems Administration

Learn to configure, maintain and deploy Linux operating systems and services. The backbone of the Internet is made up of Linux systems running web server, databases, DNS, backup and more. The class will prepare students to deploy services and code in a Linux environment.

Requisites: Restricted to Telecommunications (TLEN) graduate students only.

Grading Basis: Letter Grade

TLEN 5920 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 6940 (1) Candidate for Degree

Requisites: Restricted to Leeds School of Business or College of Engineering graduate students only.

Grading Basis: Pass/Fail

TLEN 6950 (1-6) Master's Thesis

Requisites: Restricted to Leeds School of Business or College of Engineering graduate students only.

TLEN 7000 (1-6) Current Topics in Telecommunications

Studies research topics of current interest in telecommunication and networking.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

TLEN 7001 (3) Interdisciplinary Telecom Analysis

Examines a set of problems, research methodologies and analytical techniques that are common to the research, problem solving and analysis of information and communications technology development and deployment issues. Looks critically at the strengths, limitations and underlying assumptions of key research and analysis approaches that relate business, economic and policy objectives to current and future telecommunications development and deployment efforts.

Grading Basis: Letter Grade

TLEN 8990 (1-10) Doctoral Dissertation

Investigates specialized topic or field in the area of telecommunications. Approved and supervised by faculty members.

Requisites: Restricted to graduate students only.

Telecommunications - Master of Science (MS)

The Interdisciplinary Telecommunications Program (ITP) offers to students the skills that allow them to master not only the latest technologies associated with the Internet, but also the business skills and policy knowledge essential to achieving success in the companies driving today's rapidly changing high-tech world. We offer hands-on experience in our world-class labs equipped with state-of-the-art technologies.

Admitted students select from among the following specializations in some of the most sought-after areas in the broadband arena:

- network engineering
- network security
- telecom policy and strategy
- wireless networking
- open option

For more information, visit the program's Master of Science in Telecom (<http://www.colorado.edu/itp/masters-degree>) webpage.

Concurrent/Five-Year Degree Programs

The Interdisciplinary Telecommunications Program also offers several concurrent/five-year degrees which combine a BS degree with the telecommunications MS.

- BS in applied mathematics (p. 637) & MS in telecom
- BS in computer science (p. 689) & MS in telecom
- BS in electrical and computer engineering (p. 710) & MS in telecom

For more information, visit the program's Concurrent & Dual Degrees (<http://www.colorado.edu/itp/dual-degree>) webpage.

Dual Degree Programs

Students pursuing a telecommunications dual degree must be admitted to both schools/programs under their respective admissions procedures and standards.

- MBA (p. 1135) & MS in telecom
- ME in engineering management (p. 1247) & MS in telecom
- JD & MS in telecom (p. 1378)

For more information, visit the program's Concurrent & Dual Degrees (<http://www.colorado.edu/itp/dual-degree>) webpage.

Requirements

The following course requirements are subject to change; for the most current information, visit the program's Master of Science in Telecom (<http://www.colorado.edu/itp/masters-degree>) webpage.

General Requirements

The Master of Science in telecommunications requires, at minimum, 36 credit hours completed at the 5000 level or above, including 33 credits from telecommunications core courses (eight courses) and specific education track requirements.

Students must maintain a cumulative GPA of at least 3.00, and may elect to pursue a capstone or thesis for their culminating project.

Program Tracks

Network Engineering Track Sample Two-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
TLEN 5010	Network Economics and Finance I	3
TLEN 5330	Data Communication 1	3
TLEN 5830	Special Topics (Fundamentals of Network Programming)	1
TLEN 5842	Linux Systems Administration	3
		Credit Hours
		10
Spring Semester		
TLEN 5130	Telecommur Business Strategy	3
TLEN 5410	Network Management and Operations	3
TLEN 5460	Telecommur Systems Laboratory	3
		Credit Hours
		9
Year Two		
Fall Semester		
TLEN 5210	Principles of Telecommur Policy	3
One of the following:		3
TLEN 5462	Datacenter Networks	
TLEN 5840	Voice Over IP Lab: Voice Network Design and Implementation	
TLEN 5830	Special Topics (Next Generation Networks)	
TLEN 5830	Special Topics (Service Provider Networks)	
TLEN 5700	Research Methods	2
		Credit Hours
		8
Spring Semester		
TLEN 5370	IP Routing Protocols	3

Other elective		3
One of the following:		3-6
TLEN 5710	Capstone	
TLEN 6950	Master's Thesis	
	Credit Hours	9-12
Total Credit Hours		36-39

**Network Security Track
Sample Two-Year Plan of Study**

Course	Title	Credit Hours
Year One		
Fall Semester		
TLEN 5010	Network Economics and Finance I	3
TLEN 5330	Data Communical 1	3
TLEN 5530	Applied Network Security	3
TLEN 5830	Special Topics (Fundament. of Network Programmin	1
		Credit Hours 10
Spring Semester		
TLEN 5130	Telecommur Business Strategy	3
TLEN 5540	Network Security Laboratory	3
TLEN 5841	Secure Web Application Developmen	3
		Credit Hours 9
Year Two		
Fall Semester		
TLEN 5210	Principles of Telecommur Policy	3
TLEN 5700	Research Methods	2
TLEN 5830	Special Topics (Large Scale Network Analysis)	3
		Credit Hours 8
Spring Semester		
TLEN 5830	Special Topics (Secure Embedded Programmin	3
One of the following:		3

TLEN 5842	Linux Systems Administrati	
Other elective		
One of the following:		3-6
TLEN 5710	Capstone	
TLEN 6950	Master's Thesis	
		Credit Hours 9-12
Total Credit Hours		36-39

**Telecom Policy and Strategy Track
Sample Two-Year Plan of Study**

Course	Title	Credit Hours
Year One		
Fall Semester		
TLEN 5010	Network Economics and Finance I	3
TLEN 5210	Principles of Telecommur Policy	3
TLEN 5438	Internet Lab	3
TLEN 5830	Special Topics (Fundament. of Network Programmin	1
		Credit Hours 10
Spring Semester		
TLEN 5130	Telecommur Business Strategy	3
TLEN 5310	Telecommunications Systems	3
Other elective		3
		Credit Hours 9
Summer		
TLEN 5230	Spectrum Managemen and Policy (Maymester)	3
		Credit Hours 3
Year Two		
Fall Semester		
TLEN 5330	Data Communical 1	3
TLEN 5700	Research Methods	2
One of the following:		3-4
TLEN 5250	Technology Law and Policy Clinic	

TLEN 5XXX	Intro to Telecom Lab II	Credit Hours	8-9
Spring Semester			
One of the following:			3
TLEN 5106	International Deployment of Broadband Networks		
TLEN 5380	Future of Video: Technology, Policy, and Economics		
One of the following:			3-6
TLEN 5710	Capstone		
TLEN 6950	Master's Thesis		
Credit Hours			6-9
Total Credit Hours			36-40

**Wireless Networking Track
Sample Two-Year Plan of Study**

Course	Title	Credit Hours
Year One		
Fall Semester		
TLEN 5010	Network Economics and Finance I	3
TLEN 5330	Data Communicational 1	3
TLEN 5830	Special Topics (Wireless Systems)	3
TLEN 5830	Special Topics (Fundament. of Network Programmin)	1
Credit Hours		10
Spring Semester		
TLEN 5130	Telecommur Business Strategy	3
TLEN 5520	Wireless Local Area Networks	3
TLEN 5560	Wireless Systems Laboratory	3
Credit Hours		9
Summer		
TLEN 5230	Spectrum Managemen and Policy (Maymester)	3
Credit Hours		3

Year Two

Course	Title	Credit Hours
Fall Semester		
TLEN 5210	Principles of Telecommur Policy	3
TLEN 5510	Wireless and Cellular Communications	3
TLEN 5700	Research Methods	2
Credit Hours		8
Spring Semester		
TLEN 5830	Special Topics (Advanced Wireless Lab)	3
One of the following:		
TLEN 5710	Capstone	
TLEN 6950	Master's Thesis	
Credit Hours		6-9
Total Credit Hours		36-39

**Open Option Track
Sample Two-Year Plan of Study**

Course	Title	Credit Hours
Year One		
Fall Semester		
TLEN 5010	Network Economics and Finance I (Required Business Course)	3
TLEN 5310	Telecommur Systems (Required Technical Course)	3
TLEN 5330	Data Communications 1 (Required Technical Course)	3
TLEN 5830	Special Topics (Fundament. of Network Programmin)	1
Credit Hours		10
Spring Semester		
TLEN 5130	Telecommur Business Strategy (Required Business Course)	3
Choice of electives		6
Credit Hours		9

Year Two**Fall Semester**

TLEN 5210	Principles of Telecommunications Policy (Required Course)	3
TLEN 5700	Research Methods	2
Choice of elective		3
	Credit Hours	8

Spring Semester

Choice of electives		6
One of the following:		3-6
TLEN 5710	Capstone	
TLEN 6950	Master's Thesis	
	Credit Hours	9-12
	Total Credit Hours	36-39

Time Limit

All degree requirements must be completed within four years of the date of commencing course work. Most full-time students complete the MS within 24 months.

Telecommunications - Doctor of Philosophy (PhD)

The telecommunications PhD program is on-campus only.

The interdisciplinary telecommunications program PhD is designed for highly motivated students seeking to conduct research at the intersections of traditional telecommunications technology, economics and policy disciplines. Students learn the necessary skills to conduct research, along with a focused study plan on the specific technical areas of their interests, often mirroring one of the established areas of research in the program, such as broadband networking, wireless, policy and cybersecurity.

Applicants may have already earned a master's degree or have substantial work experience in the private or public sectors in the information communications, telecommunications or multimedia technology fields. They may also be high-achieving students straight from undergraduate study who will earn an MS as they progress toward a PhD degree.

For more information, visit the department's PhD in Telecom (<http://www.colorado.edu/itp/phd-program>) webpage.

Requirements

Course Requirements

Students must complete a total of at least 60 credits in graduate-level courses (i.e., courses taken subsequent to receiving their MS) in order to fulfill the requirements for a PhD degree.

The following course requirements are subject to change; for the most current information, see the department's ITP PhD Program (<http://www.colorado.edu/itp/node/228/attachment>) document.

Required Courses and Semester Credit Hours

Required Core Courses (8 credit hours)

TLEN 7001	Interdisciplinary Telecom Analysis	3
TLEN 7000	Current Topics in Telecommunications (Network Analysis Techniques)	3
TLEN 5700	Research Methods	2

Required Technology Courses (6 credit hours)

TLEN 5310	Telecommunications Systems	3
TLEN 5330	Data Communications 1	3

Required Business/Economics/Policy Courses (9 credit hours)

TLEN 5010	Network Economics and Finance I	3
TLEN 5130	Telecommunications Business Strategy	3
TLEN 5210	Principles of Telecommunications Policy	3

Elective Courses (7 credit hours)

Thesis Research (30 credit hours)	30
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Total Credit Hours	60
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Preliminary Examination

The preliminary examination consists of two components: a preliminary paper and successful demonstration of proficiency of ITP core courses. All students must complete both the prelim paper and all ITP core courses by their fourth semester (the spring semester of their second year, unless they have successfully petitioned the ITP PhD Preliminary Examination Committee for an exception by the end of the first month of the fall semester of their second year).

Comprehensive Examination

Students who have passed the preliminary examination at the PhD level and completed the required course work (a total of 30 credits) are eligible to take the comprehensive examination the following year, roughly 12 months after the preliminary examination. The comprehensive exam consists of an oral presentation of a written thesis proposal that is reviewed and approved by the student's Thesis Committee. The thesis proposal should describe the problem statement, research methodology, proposed research plan, along with a brief review of the background of the topic and summary of early results. The research plan should break down the research into development phases and include a tentative schedule for the completion of each research phase.

PhD Dissertation

Following the semester in which the comprehensive exam is passed, the student must be continuously registered each fall and spring for dissertation hours until the student successfully defends his or her dissertation or formally withdraws from the program. These students are required to register for at least 5 credit hours per semester of dissertation research (on campus), or for at least 3 credit hours per semester if dissertation research takes place off campus (distance).

Computer and Network Security - Graduate Certificate

The Computer and Network Security Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>)

from the Interdisciplinary Telecommunications Program (<http://www.colorado.edu/itp>) offers students a foundation of knowledge and technical skills in the highly-sought after job markets of network engineering, network security, wireless networking, and telecom policy and strategy. Even better, ITP certificates also allow students to apply course credits toward their master's degree if they decide to continue on in their studies.

The Computer and Network Security Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) requires a completion of 12 credit hours. This certificate can be completed on-campus or from a distance.

Network Architecture - Graduate Certificate

The Network Architecture Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) from the Interdisciplinary Telecommunications Program (<http://www.colorado.edu/itp>) (ITP) offers you a foundation of knowledge and technical skills in the highly sought-after job markets of network engineering, network security, wireless networking, and telecom policy and strategy. Even better, ITP certificates also allow you to apply course credits toward your master's degree if you decide to continue on in your studies.

The Network Architecture Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) requires the completion of 12 credit hours and is offered **on-campus only**, at this time.

Telecommunications Policy - Graduate Certificate

The Telecommunications Policy Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) from the Interdisciplinary Telecommunications Program (<http://www.colorado.edu/itp>) offers you a foundation of knowledge and technical skills in the highly sought-after job markets of network engineering, network security, wireless networking, and telecom policy and strategy. Even better, ITP certificates also allow you to apply course credits toward your master's degree if you decide to continue on in your studies.

The Telecommunications Policy Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) requires a completion of 12 credit hours. This certificate can be completed on-campus or by Distance.

Wireless Networks and Technologies - Graduate Certificate

The Wireless Networks and Technologies Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) from the Interdisciplinary Telecommunications Program (<http://www.colorado.edu/itp>) offers you a foundation of knowledge and technical skills in the highly sought-after job markets of network engineering, network security, wireless networking, and telecom policy and strategy. Even better, ITP certificates also allow you to apply course credits toward your master's degree if you decide to continue on in your studies.

The Wireless Networks and Technologies Graduate Certificate (<http://www.colorado.edu/itp/prospective-students/graduate-certificates>) requires the completion of 12 credit hours and is offered **on-campus only**, at this time.

Interdisciplinary Programs

CU Boulder offers an ever-growing number of interdisciplinary and professional graduate certificate programs to complement a traditional education. New graduate certificates must be approved by the Graduate School's Executive Advisory Council (EAC).

For an updated list of graduate interdisciplinary certificates, visit Graduate Admissions' Certificate Programs (<http://www.colorado.edu/admissions/graduate/programs/certificates>) webpage.

Computational Linguistics - Master of Science (MS)

The computational linguistics, analytics, search and informatics (CLASIC) program provides a solid foundation in both computer science and linguistics graduate course work, as well as several courses focused on data-driven linguistics, computational linguistics and information processing.

Distance Education

Students can take individual courses toward a master's degree through distance education (online), although linguistics courses are not currently offered online. For more information, connect with the graduate program advisor or visit CU Boulder Connect's Master's Programs (<http://www.colorado.edu/graduateschool/admissions/distance-education/masters-programs>) webpage.

Requirements

Students must complete at least 32 hours of approved graduate study, including a 2-credit capstone course focused on a publishable research project, which will run in conjunction with an internship or CU-based research project. As part of the capstone, students will be evaluated by their employer or industry project manager. Students will also prepare a technical report on the completed project that the program directors and project leader will jointly evaluate.

Required Courses and Semester Credit Hours

Core Linguistics Courses

LING 5030	Linguistic Phonetics	3
LING 5420	Morphology and Syntax	3
	or LING 6450 Syntactic Analysis	
LING 5430	Semantics and Pragmatics	3

Core Computer Science Courses

Choose three of the following:			9
CSCI 5417	Information Retrieval Systems		
	or CSCI 5817 Database Systems		
CSCI 5454	Design and Analysis of Algorithms		
	or CSCI 5444 Introduction to Theory of Computation		
	or CSCI 5714 Formal Languages		
CSCI 5535	Fundamental Concepts of Programming Languages		
CSCI 5606	Principles of Numerical Computation		

or CSCI 564€ Numerical Linear Algebra		
CSCI 5839	User-Centered Design and Development 1	
CLASIC Core		
CSCI/LING 5832	Natural Language Processing	3
CSCI 7000/ LING 7800	Current Topics in Computer Science (Computational Lexical Semantics)	4
CSCI 7000/ LING 7800	Current Topics in Computer Science (Capstone Project)	2
Choose one of the following:		3
LING 6520	Topics in Comparative Linguistics (Computational Grammars)	
CSCI 6302	Speech Recognition and Synthesis	
LING 6300/3800	Topics in Language Use (Formal Models of Linguistics)	
LING 7800	Open Topics in Linguistics (Computational Phonology and Morphology)	
CSCI 7222	Topics in Nonsymbolic Artificial Intelligence (Representation Learning for Language)	
Total Credit Hours		30

Environmental Justice - Graduate Certificate

Environmental justice (EJ) refers to the right to a safe and healthy environment for everyone, regardless of race, class, gender, ability or other considerations, as well as a place at decision-making tables. From this perspective, the environment is not separate from society, but includes spaces where people live, work, play, learn and/or pray. The CU Boulder graduate certificate in Environmental Justice provides training in the interdisciplinary and dynamic field of environmental justice studies, as well as opportunities for engaged interactions with the challenges and solutions environmental justice communities face today. The certificate program is open to CU-Boulder graduate students from all units and programs, and seeks to include scholars and practitioners from diverse disciplinary and experiential backgrounds in its development.

Requirements

The certificate program is open to all CU-Boulder graduate students.

Required Courses

Required Course

Foundations of Environmental Justice	3
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Electives

COMM 5225	Environmental Communication	
ENVS 5100	Special Topics in Environmental Studies	
GEOG 6402	Seminar: Political Ecology	
GEOG 5662	Seminar: Topics in Economic Geography	
HIST 6410	Readings in Environmental History	
PHIL 5240	Seminar in Environmental Philosophy	
PSCI 7024	Seminar: Selected Political Theories (Environment and Political Theory)	
SOCY/ENVS 6007	Foundations of Environmental Sociology	
SOCY 6017	Inequality, Democracy, and the Environment	

Total Credit Hours		12
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Graduate Teacher Program - Graduate Certificate

The Graduate Teacher Program (GTP) is a division of the graduate school. Activities prepare graduate students to teach while on the CU Boulder campus and provide continued professional development opportunities as they move through their graduate programs. We help graduate students succeed on the job market and in higher education or the private sector as professionals once they graduate.

To that end, we offer:

- comprehensive college teacher training (workshops on teaching, individual consultation on any aspect of the graduate experience, video consultation on teaching in labs, recitations, and courses)
- workshops and guidance to support the scholarship of teaching and learning
- academic and nonacademic career preparation opportunities through conferences, seminars, poster sessions, and individual consultations on curriculum vitae, job letters, teaching statements, and interviewing skills
- special workshops and groups to support academic writing for publication and other topics

Requirements

The Graduate Teacher Program also offers graduate students the opportunity to pursue three certificates. Requirements for each are posted on the Graduate Teacher Program (<http://www.colorado.edu/gtp>) website:

- The certificate in college teaching (<http://www.colorado.edu/gtp/certificates/certificate-college-teaching>) is designed for graduate students who teach laboratories, recitations or courses as instructor-of-record on the Boulder campus.
- The professional development certificate for preparing future faculty (PDC/PFF) (<http://www.colorado.edu/gtp/certificates/professional-development-certificate-preparing-future-faculty>) allows those who do not teach the chance to do a project to learn about postsecondary teaching or institutions.
- The professional development certificate (PDC/BGIA) (<http://www.colorado.edu/gtp/certificates/professional-development-certificate-business-government-industry-arts>), in collaboration with Career Services, is available for graduate students considering nonacademic career paths.

GTP works directly with 45 departments through the Lead Network, which manages 50 graduate student consultants. Lead consultants receive intensive training, provide video consultation on teaching for teaching assistants and GPTIs, and assist department faculty with discipline-specific TA training.

The program's Collaborative Preparing Future Faculty Network (COPFFN) consists of 26 colleges and universities on the Front Range and provides opportunities to learn about various collegiate teaching environments. Graduate students may attend site visits to partner campuses, collaborate with a mentor on a partner campus, and attend

the COPFFN Forum where COPFF Network faculty speak about their careers.

The program collaborates with the University Libraries to offer Provost's Fellowships for the University Libraries to graduate students who wish to explore academic librarianship as a career.

Additionally, international graduate students may request personal consultations on teaching, career planning and referrals to ESL services.

Language Technology - Graduate Certificate

The graduate certificate in language teaching with technology is offered by the the Division of Continuing Education at the University of Colorado Boulder. It is a 12-credit fully online graduate program. It is designed for language educators who wish to improve their technological, pedagogical and linguistic proficiency. The courses are fully online and taught by experienced language educators. Visit the Language Technology Graduate Certificate website for additional details.

Requirements

Students must complete 12 credits from the list of courses below in order to complete the certificate, not necessarily in the order listed below. Additional courses may be added as they become available. Visit the Language Technology Graduate Certificate (<http://www.colorado.edu/elevatecertificate>) website for additional details.

Required

LGTC 5020	Educational Technology Foundation	3
LGTC 5030	Language Technology Tools in Practice	3

Electives

LGTC 5010	Fundamentals of Second Language Acquisition and Teaching Practice	6
LGTC 5032	Gamification of Language Learning	
LGTC 5035	Online Language Learning: Best Practices	
LGTC 5040	Telecollaboration for Language Learning Foundations	
LGTC 5045	Telecollaboration Exchange for Language Learning	
LGTC 5050	Language Technology Practicum	

Total Credit Hours 12

Native American and Indigenous Studies - Graduate Certificate

The Center for Native American and Indigenous Studies (CNAIS) offers both a graduate and undergraduate certificate in Native American and Indigenous Studies (NAIS). These certificate programs offer students the opportunity to strengthen their interdisciplinary knowledge and experience in this increasingly important area. The rise of global and scholarly attention to issues of indigeneity signals a larger transformation in conceptions of nation, citizenship, and transnationalism in the context of globalization.

A founding principle of CNAIS is to value and expand upon the connections and interdisciplinary nature of Native American & Indigenous scholarly work. The issues facing Native American and Indigenous peoples today require expertise from multiple disciplines and draw from scholarship in a number of fields, including art & art history, anthropology,

ethnic studies, environmental studies, geography, history, law, linguistics, literature, political science, religion and sociology.

CU Boulder has recruited an unprecedented number of faculty working in a wide array of areas related to NAIS, and already enjoys a high national and international reputation in several of these areas. In pursuing the NAIS certificate, students join a vibrant and growing community at CU Boulder, including graduate and undergraduate students and more than 40 professors.

For more information, visit the Center for Native American and Indigenous Studies (<http://www.colorado.edu/cnais>) website or contact cnais@colorado.edu.

Requirements

This interdisciplinary certificate requires a total of four courses (12 credits). One introductory course (ETHN 6103) is required of all students; the other courses can be taken electively, with the provision that two of the four courses be outside the student's home department.

Required Courses and Semester Credit Hours

Required Course

ETHN 6103	Indigenous Thought and Theory: Foundations in NAIS	3
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Electives¹

At least three of the four required elective courses must be taken outside the student's home department.

Approved Anthropology Courses

ANTH 5020	Explorations in Anthropology	
ANTH 5045	Introduction to Museum Anthropology	
ANTH 5150	Human Ecology: Biological Aspects	
ANTH 5210	Southwestern Archaeology	
ANTH 5220	From Olmec to Aztec: The Archaeology of Mexico	
ANTH 5224	Archaeology of the Maya and Their Neighbors	
ANTH 5270	Plains Archaeology	
ANTH 5470	Collections Research Practicum in Cultural Anthropology	
ANTH 5630	Nomadic Peoples of East Africa	
ANTH 5780	Core Course-Cultural Anthropology	
ANTH 5785	Advanced Seminar in Cultural Anthropology	
ANTH 6150	Critical and Theoretical Issues in Museums	
ANTH 6320	Linguistic Anthropology	
ANTH 7000	Seminar: Current Research Topics in Cultural Anthropology (Topic: Affect, Theory, Ethnography)	
ANTH 7010	Seminar: Contemporary Theory in Cultural Anthropology	
ANTH 7300	Seminar: Research Methods in Cultural Anthropology	

Approved Art and Art History Courses

ARTH 6939	Graduate Seminar: Open Topics in Art History (Topic: Visual, Material and Artistic Culture of the Plains and Plateau regions, 1800-1900)	
ARTS 5423	Graduate Screen Printing	
ARTS 5433	Graduate Alternative Printmaking (Non-Toxic)	

Approved Economics Courses

ECON 8534	Economic History of North America	
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Approved English Courses

ENGL 5059	British Literature and Culture After 1800
ENGL 5169	Multicultural/Postcolonial Studies
ENGL 7179	Advanced Multicultural/Postcolonial Studies
<i>Approved Environmental Studies Program Courses</i>	
ENVS 5740	Context-Sensitive Research Methods
ENVS 5820	Energy Policy in the 21st Century
ENVS 5830	Critical Issues in Climate and the Environment
ENVS 6007	Foundations of Environmental Sociology
<i>Approved Ethnic Studies Courses</i>	
ETHN 5353	Indigenous Traditions and Law: A Global Perspective
ETHN 5553	Indigenous Representations in the United States
ETHN 6841	Advanced Directed Readings in Ethnic Studies
<i>Approved Geography Courses</i>	
GEOG 5632	Development Geography
GEOG 6402	Seminar: Political Ecology
<i>Approved History Courses</i>	
HIST 6317	Readings in the American West
HIST 6410	Readings in Environmental History
<i>Approved Law School Courses</i>	
LAWS 6602	Cultural Property Law
LAWS 7309	American Indian Law Clinic
LAWS 7725	American Indian Law I
LAWS 7735	American Indian Law II
LAWS 7745	Jurisdiction in Indian Country
LAWS 7846	Independent Legal Research (on an American Indian Law topic)
LAWS 8725	Seminar: Advanced Topics in American Indian Law
<i>Approved Linguistics Courses</i>	
LING 6320	Linguistic Anthropology
LING 6500	Issues in Indigenous Languages
LING 7350	Language and Gender in Cultural Perspective
<i>Approved Music Courses</i>	
MUSC 5112	Proseminar in Ethnomusicology
MUSC 5142	American Indian Music
<i>Approved Museum and Field Studies Courses</i>	
MUSM 5045	Introduction to Museum Anthropology
MUSM 5912	Collections Research Practicum in Cultural Anthropology
<i>Approved Religious Studies Courses</i>	
RLST 5030	Religions in America
RLST 5300	Topics in Native American Religions
RLST 5350	Native American Religions: Regional Studies
Total Credit Hours	12

¹ Elective courses not taught by CNAIS core or affiliate faculty must be approved by the CNAIS director.

Organizational Leadership - Master of Science (MS)

The Master of Science in organizational leadership is an interdisciplinary, fully online professional master's degree that prepares early- to mid-career professionals to succeed as tomorrow's dynamic leaders. Through

course work that blends business, communications and social sciences, the program develops the knowledge and skills students need to think critically about organizational challenges and how to address them using best practices. Students learn to align others around a shared vision, build and manage effective teams, and apply the leadership skills necessary to excel in an increasingly fast-paced and complex working world.

For more information, visit the Master of Science in Organizational Leadership (<http://ce.colorado.edu/program-landing/master-science-organizational-leadership>) webpage.

Requirements

Students must complete at least 30 credit hours of graduate course work. The program is composed of 10 courses: six core courses and four specialized track courses.

Core Courses

Core courses ensure that students have the necessary understanding of the complexities of organizational leadership and the varied dimensions of change within the context of public, private and nonprofit organizations. The curriculum prepares graduates to be successful in understanding organizational cultures, anticipating and managing change, and enhancing performance and human capital management.

- Leadership and Organizations
- Leading Change and Innovation
- Analytics and Data-Driven Decision Making
- Strategic Communications
- Performance Management
- Capstone

The purpose of the capstone, the final course of the program, is for students to apply knowledge and skills acquired during their program to addressing actual challenges facing an organization. Students do this—under the guidance of the instructor and other subject matter experts—by collecting, processing and analyzing data and information about the organization and applying appropriate analytic methods to develop, propose and substantiate their recommended solution to the organization's problem.

Track Courses

Students may choose to specialize in one of the following tracks.

Human Resources Track

This track is ideal for students who wish to transition to a new career in human resource management or who want to focus on enhancing employee satisfaction and organizational performance as they ascend their career ladder. Courses include:

- Negotiation and Conflict Resolution
- Human Resources Law
- Compensation and Benefits
- Training and Development

Strategic Leadership Track

This track is geared for students who want to develop knowledge and skills to move from functional- or technical-based positions into general management, including the ability to think, plan and operate

strategically, lead personnel in the allocation of organizational resources and accomplish organizational objectives. Courses include:

- Strategic Planning in Organizations
- Competitive Analysis and Communication
- Organizations and the Law
- Operations and Designs of Organizations

Organizational Leadership (Broad Perspective) Track

This is a great track option for those who want exposure to both strategic leadership and HR concepts. Students select any four courses from the other tracks' offerings.

Quantitative Biology - Graduate Certificate

Through interdisciplinary quantitative biology, students learn the essential competencies demonstrated by knowledgeable and well-rounded researchers who collaborate effectively between disciplines. These competencies may be attained in a number of ways, including courses, lab rotations and outreach activities.

Requirements

While pursuing the PhD degree, IQ biology student remain engaged with the IQ biology program by:

- Attending seminars with the IQ biology community, as well as meeting with the speaker and IQ biology students before each seminar when possible.
- Developing and presenting research in a student-run IQ biology symposium on campus.
- Mentoring new IQ biology students
- Attending social gatherings held for the entire IQ biology community.

After completing all program requirements, graduating students will receive a certificate in interdisciplinary quantitative biology in addition to their PhD.

Core Courses

These courses cover cutting-edge quantitative techniques, and include one course in the fall and two courses in the spring. IQ biology core courses count simultaneously toward each home department's electives.

Gap Filling Courses

Students must take two courses outside of their primary discipline(s). These courses allow students to explore other areas of quantitative biology and fill any gaps in your background to benefit your future interdisciplinary research.

Lab Rotations

Students will also rotate through three different research labs in at least two different disciplines. These rotations allow students to explore their interests, learn new techniques and work with prospective thesis advisors.

Additional Course Work and Research

During the second year, students begin taking the courses required by their chosen academic department, and those advised by their departmental thesis committee.

Quantitative Methods for Behavioral Sciences - Graduate Certificate

The purpose of the graduate certificate in quantitative methods is fourfold:

- to strengthen interdepartmental links and communication among social and human science departments at CU Boulder, both in general and specifically with regards to quantitative research methodology and statistical analysis,
- to provide incentive and recognition to graduate students from a diverse set of departments who choose to cultivate expertise in quantitative research methods and methods of statistical analysis,
- to increase the visibility of and promote courses in quantitative research methods (possibly with the benefit that additional quantitative courses can be developed and taught), and
- as a consequence of all of the above, to improve the quality of quantitative training of graduate students at CU Boulder, increasing students' chances of employment upon completion of their graduate studies.

Requirements

Students will be awarded the certificate if they complete:

- a two-semester foundational sequence in statistics (e.g., EDUC 8230/8240, PSYC 5741/5751, SOC 5111/6111), and
- a minimum of four additional courses from the approved list below, at least one of which must be outside the student's home department.

Students from a department that does not offer a two-semester sequence of this nature are welcome to take one of the three sequences listed above, and are encouraged to make contact with the instructors of those sequences to determine which of them would provide the best fit.

Application Process

1. Review the requirements above
2. Complete the application form (<https://www.colorado.edu/education/node/3115/attachment>) (see also example form (<https://www.colorado.edu/education/node/3113/attachment>))
3. Review application with the advisor to ensure the courses meet the advisor's expectations for expertise in quantitative methods training;
4. Submit the application electronically—along with all available syllabi and an unofficial transcript—to allison.attedberry@colorado.edu

Note: If your course plan meets the requirements and all courses have already been completed at the time of application, the student will receive approval for the certificate. If some of the intended coursework will take place in future semesters, then the student will be given "conditional" approval. Once all coursework is completed, the student must submit an updated application that includes an unofficial transcript showing that the courses were satisfactorily completed.

Applications will be reviewed once per semester. Deadlines are Nov. 1 and March 1.

The guidelines serve as a minimum threshold for the application process. However, each student's advisor may require his/her students to take more than the minimum of 6 courses, or to decide that certain courses are not sufficiently rigorous to count towards the certificate. The

application will then be reviewed by a cross-disciplinary committee to evaluate whether the course plan meets the certificate requirements.

Required Courses and Semester Credit Hours

Course Listings

EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	3
EDUC 7386	Educational Evaluation	3
EDUC 7456	Multilevel Modeling	3
EDUC 7396	Categorical Data Analysis	3
EDUC 8710	Measurement in Survey Research	3
EDUC 8720	Advanced Topics in Measurement	3
IPHY 5300	Statistical Genetics for Complex Traits	3
IPHY 5800	Advanced Statistics and Research Methods in Integrative Physiology	4
MKTG 7310	Design and Analysis of Experiments in Business	3
MKTG 7825		3
ORMG 7830	Research Design and Methods in Management	3
PSCI 7108	Special Topics	3
PSCI 7155	Maximum Likelihood Estimation and Generalized Linear Models	3
PSYC 5122	Quantitative Genetics	3
PSYC 5242	Biometrical Methods in Behavioral Genetics	3
PSYC 5541	Special Topics in Psychology	1-6
PSYC 5761	Structural Equation Modeling	3
PSYC 6200	Issues and Methods in Cognitive Science	3
EDUC 7326	Quasi-Experimental Design in Causal Inference in Social Sciences	3
PSYC 6761	Topics in Advanced Structural Equations Modeling	3
SOCY 5031	Research Design	3
SOCY 7111	Data III--Advanced Data Analysis	3

Water Engineering and Management - Graduate Certificate

The Water Engineering & Management (WE&M) graduate certificate provides an in-depth study of the tools demanded by the rigors of the water profession. Students can build non-technical competencies with courses on leadership, management, communication, finance, and governance. The faculty consists primarily of senior water professionals from across the country.

The certificate is granted by WE&M program, and the certificate courses listed count as electives towards the Civil Engineering Master of Science (MS) degree or the Engineering Management Program's Master of Engineering (ME) degree.

Currently, WE&M students include young professionals working for utilities, consulting firms, government, and regulatory agencies, and degree-seeking graduate students at CU Boulder.

Distance Education

Students can complete the requirements for the graduate certificate via on-campus or distance education (online) through Boulder Connect (<http://www.colorado.edu/connect/certificate-programs>).

Requirements

Three courses are required plus one elective course. The certificate is 12 credit hours in total.

Required Courses		9
CVEN 5574	Water Utility Management: Current Issues and Future Challenges	
CVEN 5564	Water Profession: Leadership & Communication	
CVEN 5584	Water Profession: Financial and Management	
Elective		3
CVEN 5147	Civil Engineering Systems (Engineering Economics and System Design)	
CVEN 5454	Statistical Methods for Natural and Engineered Systems (Quantitative Methods)	
CVEN 5834	Special Topics (Decision Support for Water Systems)	
PUAD 5631	Seminar in Environmental Politics & Policy ¹	
PUAD 5633	Seminar in Natural Resource & Environmental Health Law ¹	
Other electives with permission of WE&M Program Director		
Total Credit Hours		12

¹ CU Denver course

Media, Communication and Information

The College of Media, Communication and Information (CMCI) prepares students for careers as engaged and effective citizens endowed with deep understanding of the historical and contemporary context of human communication and expression. Mindful of the active role communication plays in shaping human relationships, CMCI trains graduates to study and practice constructive interaction among people, communities, industries and publics. The college equips students with the skills needed to produce, gather, archive, curate, analyze and evaluate the flood of information, messages, images, sounds and ideas that populate our complex and rapidly evolving global media landscape.

To these ends, CMCI resourcefully combines disciplines newly extended and empowered by digital media and the social and cultural transformations those media engender. These include established scholarly, creative and professional fields such as media studies, communication, the history and interpretation of film and television, journalism, advertising and video production in its cinematic, documentary and broadcast forms. But the college also houses both the fast-growing field of information science—a discipline that, through inquiry and innovation, tackles the problems and opportunities facing an increasingly networked society—and the emergent disciplines of intermedia art, design, music, writing and performance.

In giving these activities a collaborative home, CMCI facilitates innovative interactions among them. Its academic structure accordingly stimulates cross-disciplinary cooperation at all levels of curriculum, research and creative work. Further, CMCI promotes the transformational exchanges it nurtures within its own walls for campus-wide benefit. Its organization thus fosters outreach to—and student and faculty participation from—other schools, colleges, centers and facilities throughout CU Boulder and the wider Colorado community.

CMCI's collaborative character is even more visible at the graduate level and in terms of its faculty's scholarly and creative work. Examples include the doctoral program in information science (p. 1296), the master's in interdisciplinary documentary media practices (p. 1291), the doctoral program in intermedia art, writing and performance (p. 1298) and the doctoral program in media research and practice (p. 1303), which offers three PhD tracks, each lodged in a different yet related department. CMCI's signature spirit of collaboration is further reflected in the various centers the college contains:

- the Center for Environmental Journalism (CEJ)
- the Center for Media, Religion and Culture (CMRC)
- the Center for the Study of Conflict, Collaboration and Creative Governance (3CG)

It is also reflected in the close relations the new college hopes to entertain with centers elsewhere on campus—for example, with the Center for Humanities and the Arts (CHA); the Center for Media, Arts and Performance (CMAP); and the Stan Brakhage Center.

Statement of Core Skills, Competencies and Scholarly and Creative Initiatives

Given its mission, CMCI attracts students, faculty and industry and creative professionals from across the closely related fields of media, communication and information. All of those either rostered in or affiliated with the new college accordingly share a set of skills, competencies and scholarly and creative interests that form a common core. This core is expressed at all levels of the college, from undergraduate curriculum and graduate training to the research and creative work of its faculty and both internal and external affiliates.

The Graduate Experience and Faculty Research and Creative Work

CMCI's collaborative character is even more visible at the graduate level and in terms of its faculty's scholarly and creative work. A prime example is the doctoral program in media research and practice (p. 1303), which combines the emphases of the participating departments—advertising, public relations and design, journalism and media studies—and encourages students to develop research agendas that bridge disciplines and cross between academic research and professional practice. In addition to creating efficiencies by combining resources, the program underscores the shared technical and intellectual as well as logistical needs of the units involved, turning streamlined administration into scholarly and creative synergy.

Journalists learn from information scholars about the nature and uses of big data while sharing with them their skills in narrative and communication. Members of the communication faculty deepen colleagues' insights into the underlying forms and principles of organizational, interpersonal and public conversation that structure the worlds in which advertising and strategic communication operate while gaining access from colleagues in these areas to problems and case studies they might have overlooked. Meanwhile, faculty in media studies benefit from direct exposure to the technologies and creative processes explored by media production faculty, offering in return a deeper historical, social and theoretical insight into the way media shape, even as they are shaped by, the wider society they serve.

Centers like CMRC, CEJ and 3CG already harness CU's exceptional multidisciplinary resources in everything from cultural studies to

environmental science and from journalism to media design in focused collaborative initiatives of all sorts. By bringing practitioners in all of these areas together with artists and researchers in information science, media production and intermedia art, writing and performance, CMCI provides the environment for many more such common enterprises in the future.

Programs of Study

Advertising, Public Relations and Media Design

The Department of Advertising, Public Relations and Media Design (APRD) strives to produce leaders in the area of strategic communication who have mastered a design-thinking process grounded in analytical and creative thought. We believe in amplifying our students' curiosity, increasing their tolerance for risk and encouraging them to look at life and a career with an entrepreneur's eye for opportunity. APRD is committed to providing students the necessary tools and techniques to think critically, adapt, create and above all lead in a rapidly changing media world.

Our goal is to help students acquire the kind of in-depth expertise in at least one area of strategic communication and design that will enable them to generate ideas and solve problems for a variety of organizations, including but not limited to ad agencies, PR firms, publishing and design firms, nonprofits, start-ups and personal ventures. We produce graduates who are forward-looking and have a deep interest in and knowledge of diverse cultures both within the United States and throughout the world.

The department actively encourages students to enroll in courses offered both within and outside CMCI. Similarly, many of our courses are open to students in other units on the grounds that the design-thinking process can be used to solve problems in a wide variety of disciplines.

Course code for this program is APRD.

Master's Degree

- Strategic Communication Design - Master of Arts (MA) (p. 1282)

Doctoral Degree

- Media Research and Practice - Doctor of Philosophy (PhD) (p. 1303)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Duncan, Thomas R.
Professor Emeritus

Gangadharbatla, Harsha (https://experts.colorado.edu/display/fisid_153279)
Associate Professor; PhD, University of Texas at Austin

Logan, Keltly Irene (https://experts.colorado.edu/display/fisid_147340)
Associate Professor; PhD, University of Texas at Austin

Moriarty, Sandra E.
Professor Emeritus

Robbs, Brett
Professor Emeritus

Schauster, Erin E (https://experts.colorado.edu/display/fisid_1156310)
Assistant Professor; PhD, University of Missouri-Columbia

Slayden, David Lee (https://experts.colorado.edu/display/fisid_113297)
Associate Professor; PhD, Indiana University Bloomington

Willis, Erin N (https://experts.colorado.edu/display/fisid_1156068)
Assistant Professor; PhD, University of Missouri-Systems office

Courses

APRD 5001 (3) Brand Design Studio 1

Focuses on the challenges of designing brands targeted to customer needs and desires. The course is structured around the process of identifying brand opportunities, idea generation, design, testing and launch opportunities. Through a series of projects, students address aspects of practice and theory, from brand adaptation of cultural values to maintenance of brand integrity and global design strategies. Where applicable, case studies will supplement studio execution.

Grading Basis: Letter Grade

APRD 5002 (3) Experiential Design Studio 1

Provides a comprehensive understanding of design thinking and its processes to design innovative branded experiences and exchanges in a variety of strategic communication contexts. Students learn design methods applications that can be applied not only to experiential design, but to a problem where design thinking is meaningful to branded experiences. They learn standard and currently practiced design methods and, through repeated application, internalize them into a personal design aesthetic.

APRD 5003 (3) Brand Design Studio 2

Builds on and extends concepts and executions covered in Brand Design 1. While BD Studio 1 grounds the students in core branding concepts and applications, BDS 2 expands both executional skillsets and conceptual frameworks through the development of a unified theory of branding that transforms objects into meaning bearers. Through research, strategic definition, identity, expression, communications and behavior study, students will learn how to create opportunities for complex, meaning centered relationships between people and things.

APRD 5004 (3) Experiential Design Studio 2

Builds on and extends concepts and applications introduced in Experiential Design Studio 1 with a concerted focus on prototyping quickly and often the best way to both communicate and improve one's design. Integrates prototyping activities, along with research and testing techniques, into every stage of the design process. Students will learn how to choose the appropriate method to suit different dimensions of a design problem at different stages in the process and the pitfalls of each approach.

APRD 5005 (3) Critical Making Studio 1

Introduces students to the communication design possibilities of critical making by exploring the conceptual process, research and key questions framed through an iterative approach to problem solving. The learning experience includes hands-on, embodied approaches to problems that generate innovative solutions by crossing the divide between thinking and making and between the screen and physical environments.

APRD 5006 (3) RE: Studio 1

Brings students' attention to design as a form of social innovation and develops awareness of the social, political and economic contexts of design. They become literate in re the often implicit narratives embedded in design products and services, then use scenarios and storytelling to generate new strategies, build and test prototypes and write a case study detailing what was learned.

Grading Basis: Letter Grade

APRD 5007 (3) Critical Making Studio 2

Turns from software to a focus on hardware and physical computing by literally and figuratively disassembling objects: using prototyping, reverse engineering, hardware hacking and circuit bending, design fiction and electronics fabrication (i.e., Arduino, raspberry pi and more). All of this takes place in a shared, open learning environment where students and faculty critically engage with a range of digital production tools and integrates them into ordinary life.

Grading Basis: Letter Grade

APRD 5008 (3) RE: Studio 2

Develops awareness of and access to necessary tools, smart objects for example, that can enable complex dynamics among people, objects and information via a combination of physical and digital design methods, all with an eye to design driven innovation for social change. This course shifts the usual strategic communication design point of view from the typical perspective of "trend noise" and market driven models to identifying actual problems and providing possible design solutions to those problems.

Grading Basis: Letter Grade

APRD 5010 (1) Design Sprint

Executes a five-day, immersive process for answering critical business questions through design, prototyping and testing ideas with sponsoring industry partners. The outcome is a fully functional prototype that is demoed and evaluated on the final day of the sprint. This project based studio is team taught and process based. The tangible outcomes from the project, along with documentation of the process, will go into the students' professional portfolios.

Repeatable: Repeatable for up to 1.00 total credit hours.

Grading Basis: Letter Grade

APRD 5011 (3) Book Lab

Dedicated to building out an industry ready professional portfolio, this immersive studio consists of four client facing project sponsored by and developed in collaboration with the program's industry partners. In a series of three-week intensives, students will work from design briefs to concept, design and solve a variety of design problems for real world clients. Ranging from finished supercomps to functional prototypes - physical, video, projections mapping, etc. - students to market portfolios will demonstrate their command of strategic communication design across a range of media platforms.

Grading Basis: Letter Grade

APRD 5841 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

APRD 5851 (1-6) Graduate Professional Project

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

APRD 5931 (1-3) Internship

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

APRD 6940 (1) Master's Degree Candidate**Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**APRD 6951 (1-6) Master's Thesis****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**APRD 7001 (3) Pro Seminar in Strategic Communication**

Introduces the scholarly discipline of strategic communication, theories of advertising and PR including theories relating to info processing, psychological responses to messages and creativity; covers pathways to a successful career, developing an academic plan for completing graduate school, conducting research and publishing, awareness of funding possibilities and the art of teaching and academic service. Required for strategic communication track PhD students. Covers the scholarly discipline of strategic communication, theories, pedagogy and the pathways to a successful career among other things.

Grading Basis: Letter Grade**APRD 7871 (3) Special Topics****Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**MDRP 6201 (3) Global Media and Culture**

Explores the historical, cultural, social, political and economic dimensions of media systems in various parts of the world and their relationship with technological and cultural processes. Aims to provide a critical overview of the profound changes in media and culture in today's digitally connected/disconnected world. Formerly MDST 6201.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 6671 (3) Media, Myth, and Ritual**

Explores cultural practices of media audiences. Addresses theoretical and methodological implications of studying audiences from a culturalist perspective, with particular focus on media audience practices. Students engage in field research projects related to course content. Formerly MDST 6671.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 6871 (1-3) Special Topics**

Special topics. May be repeated up to 15 total credit hours

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 7001 (1) PhD Colloquium Series**

Introduce the new doctoral students to the Media Research and Practice program and its faculty members and their research. The colloquium series will also include workshops on program planning, publishing, attending conferences, writing a dissertation, preparing and presenting a job talk, etc.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.**Grading Basis:** Pass/Fail**MDRP 7011 (3) Proseminar in Media Communication Theory 1**

Introduces the principal concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7011.

Requisites: Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD) only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7021 (3) Proseminar in Media and Communication Theory 2**

Continues the introduction of principle concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7021.

Requisites: Requires prerequisite course of MDRP 7011 (minimum grade C-). Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD).**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7051 (3) Qualitative Research Methods in Media**

Examines various methods of qualitative data gathering and analysis in the mass and social media context. Formerly CMCI 7051.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7061 (3) Quantitative Research Methods in Media**

Examines various methods of quantitative data gathering methods and analysis in the mass media context. Formerly CMCI 7061.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7841 (1-6) Independent Study**

Independent study.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 7871 (3) Special Topics**

Special topics.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 8991 (1-10) Doctoral Dissertation****Repeatable:** Repeatable for up to 40.00 total credit hours.**Requisites:** Restricted to graduate students only.

Strategic Communication Design - Master of Arts (MA)

In the 21st century's connected economy, design increasingly plays a strategic role in communications—from its impact on local everyday engagements to global change. Whether the end result is a product, service or branded experience, this program focuses on the delivery of useful, desired and strategically impactful results effected by design-driven innovation.

Grounded in an understanding that design has evolved from a practice focused on the look of things to how things actually work, this program is

tailored to individuals who have a desire to lead by design in a career that rewards them emotionally and intellectually, as well as financially.

Entirely project-based, the master's program in strategic communication design operates as a series of studios that applies design thinking to problem solving in a learning culture shaped by collaboration, empathy, iteration, tinkering and experimentation.

Requirements

Application Requirements

Applicants to the strategic communication design master's degree program are expected to hold a baccalaureate (bachelor's) degree from an accredited college or university and have an undergraduate grade point average of at least 2.75. Graduate applications are accepted on a rolling basis and, once submitted, are reviewed through the online form. The application deadline for the following fall semester is Aug. 1.

Required forms that are linked to in the application are as follows:

- Personal statement: In a maximum of 1,500 words, please supply long-form answers to the following questions:
 - What attracts you to the program at this time? What do you envision as the most compelling opportunities for you as a designer and also a future leader?
 - What particular experiences—personal or professional—have prepared you for work in interaction design and social innovation?
 - Why is interaction design important to you and how would you use it to change the world?
- Three letters of recommendation from professionals and/or professors. No personal recommendations, please.
- A nonrefundable application fee of \$50.
- An online portfolio of relevant work (due by Aug. 1).

The portfolio should represent your competence in any studio-based field, e.g., graphic design, creative advertising, environmental design, film, fine arts and so on. Applicants are encouraged also to include examples of personal work (e.g., not executed for a client).

Program Requirements

Focused, immersive and transformative, the master's in strategic communication design is a 30-credit-hour degree program—in three contiguous semesters—that transforms students into generative design professionals who can hit the ground running. Integrated with industry throughout all of our activities, students in the graduate program work on professional projects with our industry partners, developing innovative solutions to problems out in the world. From short and intense design sprints to larger ongoing projects, we work with our professional partners from the creative industries to develop design-driven innovative solutions.

Four-Year Plan of Study

Course	Title	Credit Hours
Year One		
Fall Semester		
APRD 5001	Brand Design Studio 1	3
APRD 5002	Experiential Design Studio 1	3

APRD 5005	Critical Making Studio 1	3
APRD 5006	RE: Studio 1	3
APRD 5010	Design Sprint	1
		Credit Hours
		13
Spring Semester		
APRD 5003	Brand Design Studio 2	3
APRD 5004	Experiential Design Studio 2	3
APRD 5007	Critical Making Studio 2	3
APRD 5008	RE: Studio 2	3
APRD XXXX	Design Sprint 2	1
		Credit Hours
		13
Summer		
APRD 5011	Book Lab	3
APRD XXXX	Design Sprint 3	1
		Credit Hours
		4
		Total Credit Hours
		30

Contact

The contact person/email for your application is David Slayden (<http://www.colorado.edu/cmci/people/advertising-pr-and-media-design/david-slayden>), executive director. Feel free to email him (slayden@colorado.edu).

Communication

Graduate study in communication examines problems of human interaction and relationship, participation and collaboration and deliberation, dialogue and decision making in personal relationships, workplace and institutional contexts and community and public life.

Graduate students pursue research within three main areas—community & social interaction, organizational communication and rhetoric & culture—crafting individualized programs of study that meet their individual needs.

The master's program provides students with knowledge of selected bodies of communication scholarship and develops their skills in analyzing complex communication situations for a range of professional positions in business, nonprofit institutions and other types of community groups, and for doctoral study in communication.

The doctoral program provides students with opportunities to conduct theoretically grounded, practically useful research that crosses traditional academic boundaries and that prepares them to assume faculty positions in universities, as well as in research and training programs in business, government and social service agencies.

Course code for this program is COMM.

Master's Degree

- Communication - Master of Arts (MA) (p. 1286)

Doctoral Degree

- Communication - Doctor of Philosophy (PhD) (p. 1288)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackerman, John Martin (https://experts.colorado.edu/display/fisid_144951)

Associate Professor; PhD, Carnegie Mellon University

Ashcraft, Karen Lee (https://experts.colorado.edu/display/fisid_147453)
Professor; PhD, University of Colorado Boulder

Boromisza-Habashi, David (https://experts.colorado.edu/display/fisid_145833)

Associate Professor; PhD, University of Massachusetts at Amherst

Bowers, John Waite
Professor Emeritus

Campbell, Kathleen G.
Professor Emeritus

Craig, Robert T.
Professor Emeritus; PhD, Michigan State University

Darnell, Donald K.
Professor Emeritus

Deetz, Stanley A.
Professor Emeritus; PhD, Ohio University

Donald, Darnell K.
Professor Emeritus

Flores, Lisa A. (https://experts.colorado.edu/display/fisid_145474)
Associate Professor; PhD, University of Georgia

Frey, Lawrence R. (https://experts.colorado.edu/display/fisid_125937)
Professor; PhD, University of Kansas

Gries, Laurie Ellen (https://experts.colorado.edu/display/fisid_155951)
Assistant Professor; PhD, Syracuse University

Hauser, Gerard A.
Professor Emeritus

Hickerson, Ruth Lynne (https://experts.colorado.edu/display/fisid_151159)
Instructor; PhD, University of Denver

Jahn, Jody L (https://experts.colorado.edu/display/fisid_153426)
Assistant Professor; PhD, University of California-Santa Barbara

Koschmann, Matthew A. (https://experts.colorado.edu/display/fisid_145807)
Associate Professor; PhD, University of Texas at Austin

Kuhn, Timothy R (https://experts.colorado.edu/display/fisid_118144)
Professor; PhD, Arizona State University

Motter, Jeffrey Brian (https://experts.colorado.edu/display/fisid_156154)
Instructor; PhD, Indiana University Bloomington

Pezzullo, Phaedra Carmen (https://experts.colorado.edu/display/fisid_156204)
Associate Professor; PhD, University of North Carolina Chapel Hill

Simonson, Peter D. (https://experts.colorado.edu/display/fisid_143251)
Professor; PhD, University of Iowa

Skerski, Jamie L (https://experts.colorado.edu/display/fisid_149871)
Senior Instructor; PhD, Indiana University Bloomington

Sprain, Leah MH (https://experts.colorado.edu/display/fisid_151292)
Assistant Professor; PhD, University of Washington

Striphas, Theodore G. (https://experts.colorado.edu/display/fisid_156205)
Associate Professor; PhD, University of North Carolina Chapel Hill

Taylor, Bryan Copeland (https://experts.colorado.edu/display/fisid_107421)
Professor; PhD, University of Utah

Tompkins, Elaine V.
Professor Emeritus

Tompkins, Phillip K.
Professor Emeritus

Tracy, Karen (https://experts.colorado.edu/display/fisid_101190)
Professor; PhD, University of Wisconsin-Madison

White, Cindy Hagemeyer (https://experts.colorado.edu/display/fisid_107461)
Associate Professor; PhD, University of Arizona

Courses

COMM 5210 (3) Readings in Communication Theory

Critical overview of leading theoretical traditions in communication studies. Gives attention to metatheoretical issues, including epistemological foundations, the structure of communication theory as a field, and reflexivity between communication theory and cultural practice. Required for doctoral students in communication; optional for master's students.

Requisites: Restricted to graduate students only.

COMM 5220 (3) Seminar: Functions of Communication

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

Equivalent - Duplicate Degree Credit Not Granted: COMM 4220

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 5225 (3) Environmental Communication

Investigates key concepts in environmental communication and considers which theoretical frameworks and practical actions can inform the effects of various constituents to address environmental issues.

COMM 5230 (3) Applied Communication

Examines the study of applications of communication concepts, theories, methods, interventions, and other practices to address real-world issues and problems. Discusses conceptual issues framing applied communication, examines purposes and methods informing such scholarship, and provides opportunity to evaluate and propose research.

Requisites: Restricted to graduate students only.

COMM 5300 (3) Seminar: Rhetoric

Reviews current theory and research on topics such as rhetoric and publics, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

Equivalent - Duplicate Degree Credit Not Granted: COMM 4300

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 5310 (3) Contemporary Rhetorical Criticism

Advanced critical analysis of rhetorical texts in terms of how they shape issues and appeals for judgment, create identities for speakers and their audiences, and construct perceptions of time, space, and the human condition.

Requisites: Restricted to graduate students only.

COMM 5320 (3) Readings in Rhetoric

Survey of classical and contemporary readings in rhetoric. Required for doctoral students in communication; optional for master's students.

Requisites: Restricted to graduate students only.

COMM 5425 (3) Readings in Discourse and Social Practices

Examines the way communicators' discourse expressions (language, talk, interactional devices, semiotic practices, written texts) reflect and construct interpersonal exchanges, societal activities, and institutional scenes, as well as how discourse expression varies across different speech communities.

Requisites: Restricted to graduate students only.

COMM 5435 (3) Readings in Community and Social Interaction

Focuses on how everyday communication practices shape and are shaped by community contexts. Contains theoretical and empirical readings that illustrate how interactions among group members negotiate and maintain distinct communities and how group communication practices reflect shared norms among community members. Also reviews methods to study everyday interactions among community members (e.g., discourse analysis, qualitative coding, surveys and applied approaches/methods).

Grading Basis: Letter Grade

COMM 5600 (3) Seminar: Organizational Communication

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

Equivalent - Duplicate Degree Credit Not Granted: COMM 4600

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 5610 (3) Organizational Culture and Symbolism

Focuses on relationship between ideological elements (e.g., norms, values, and beliefs) and symbolic practices (e.g., metaphor, ritual, and storytelling) of organizational culture. Analyzes topics from viewpoints of academic theory and managerial practice. Reviews interpretive methods of researching workplace culture and symbolism.

Requisites: Restricted to graduate students only.

COMM 5620 (3) Readings in Organizational Communication

Survey of historical and contemporary readings in organizational communication. Treats theory, research, and application from a variety of perspectives.

Requisites: Restricted to graduate students only.

COMM 5720 (3) Readings in Communication and Technology

Survey of multidisciplinary research that examines various relationships between communication and technology. Students are encouraged to develop critical skills in perceiving assumptions and perspectives that motivate major theories in this area, and to examine how these phenomena have changed over time.

Requisites: Restricted to graduate students only.

COMM 5930 (1-6) Graduate Internship

Offers opportunities for graduate-level communication related work projects. Limited to 3 hours in spring and fall semesters, 6 hours in summer. The 6-hour limit at MA level and 9-hour limit at PhD level applies to any combination of independent study and internship credit.

Repeatable: Repeatable for up to 9.00 total credit hours.

COMM 6010 (3) Communication Research and Theory

Provides an introduction to graduate study of communication, offering an overview of the discipline and its scholarship. Required for MA and Ph.D. communication students.

Requisites: Restricted to Communication (COMM or COMN) graduate students only.

COMM 6020 (3) Quantitative Research Methods

Introduces students to the practice of quantitative research in communication: conceptualization and critique of research projects, measurements, methods (e.g., experimental and survey), statistical data analysis, and written reports.

Requisites: Restricted to graduate students only.

COMM 6030 (3) Qualitative Research Methods

Introduction to the epistemology, methodology, and representational practices associated with qualitative communication research. Fieldwork methods emphasized include participant observation, interviewing, and document/artifact analysis.

Requisites: Restricted to graduate students only.

COMM 6200 (3) Seminar: Selected Topics

Facilitates understanding of current and past theory and research on a selected topic in communication and the ability to develop new theory and research on that topic.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 6310 (3) Advanced Rhetorical Criticism

Reviews current critical methods and issues related to rhetorical criticism and rhetorical field methods.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites COMM 5310 and COMM 5320.

COMM 6320 (3) Rhetorical Theory

Reviews current theory and research on topics such as contemporary rhetorical theory, rhetoric and public life, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6330 (3) Rhetoric of Inquiry

Surveys foundational texts and contemporary research in the rhetoric of inquiry. Focuses on the role of persuasion in the production of knowledge. Critical analysis of major theoretical and methodological traditions and topics, with an emphasis on social dimensions of inquiry.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6340 (3) Rhetoric and Civic Community

Considers performances of public life as rhetorical inducements of civitas. Topics include negotiation of self-regulation among interdependent partners, rhetorical exclusions and/or counterpublics, and dialectical tensions of public/private as these contribute to and have civic consequences for publicness, community, and social will.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6350 (3) Seminar in Argumentation

Surveys foundational texts and contemporary research in argumentation. Analysis of distinctions between philosophical and rhetorical approaches to argument. Critical analysis of major theoretical and methodological traditions and topics with an emphasis on social dimensions of argument.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6360 (3) Social and Cultural Theory

Traces select traditions in social and/or cultural theory, emphasizing how those traditions affect and are affected by the field of rhetoric studies. Examines the origins and resolutions of major debates in social and/or cultural theory from a rhetorical perspective.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6410 (3) Discourse Analysis

Acquaints students with the main types of discourse analysis: conversation analysis, critical discourse analysis, and rhetorically informed discourse approaches. Teaches how to conduct discourse analysis, including transcribing, selecting excerpts, documenting inferences, and linking findings to scholarly controversies.

Requisites: Restricted to graduate students only.

COMM 6420 (3) Interaction Analysis

Educates students in one of a selected set of methodological specializations used in the study of human interaction.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

COMM 6440 (3) Grounded Practical Theory

Examines theory, method, and application of grounded practical theory, an approach to building normative theory through description, critique, and theoretical reconstruction of situated communicative practices. Semester project involves analysis of a sample of discourse from a public or field observation setting.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5210.

COMM 6445 (3) Language, Ideology and Identity

Focuses on cultural foundations of social interaction, with a special emphasis on ideology (including potentially contested cultural norms, values and premises) as a basic condition of meaningful interaction. Identities are discussed as culturally variable, historically embedded interactional accomplishments, constructed from communicative resources such as language and other types of signs, that serve the purpose of participation in communal life.

Requisites: Restricted to graduate students only.

COMM 6470 (3) Public Deliberation and Dialogue

Explores the theory, research and practices of deliberative democracy and dialogue. Considers "ideal" communicative conduct and common interactional troubles, cross-cultural differences and routine communication practices.

Requisites: Restricted to graduate students only.

COMM 6730 (3) Collaboration and Decision Making in Organizations

Explores theory and research on communication processes associated with collaboration and decision making in contemporary organizations, particularly as they are influenced by participation programs, technology, and team structures.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites COMM 5620 and COMM 6010.

COMM 6740 (3) Theory and Philosophy of Organizing and Organizations

Reviews theory and philosophy of organizations and organizing where communication processes are seen as constitutive. Focuses on discursive and material practices in the formation and change of organizational structure, culture, and operation.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5620.

COMM 6750 (3) Communication and Organizational Change

Addresses the role of communication in cultural change efforts in organizations. Topics include the nature and function of organizational cultures, role of leadership, ethical issues, and member involvement in change processes. Specific organizational cases are highlighted throughout.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5620.

COMM 6780 (3) Roles, Relationships, and Identities in Interaction

Examines how social roles influence communicative practices, the development of relationships, and the impact of relationships on identity. Considers these processes in contexts, such as personal relationships and institutional settings. Topic varies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

COMM 6840 (1-3) Master's Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 6940 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 3.00 total credit hours.

Grading Basis: Pass/Fail

COMM 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

COMM 8840 (1-6) Doctoral Independent Study

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

COMM 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Communication - Master of Arts (MA)

The master's degree provides students with knowledge of communication scholarship and develops their ability to analyze complex

communication situations. The program is intended to serve two groups of students: those planning to pursue the PhD degree and those interested in finding employment in other sectors.

MA students typically pursue studies in one or more of the department's three main areas:

- community & social interaction
- organizational communication
- rhetoric & culture

Students may choose a thesis or comprehensive examination option.

Requirements

Students wishing to pursue graduate work toward this degree should carefully read the Graduate School requirements, review the course work offered in this catalog, and attend to the detailed degree requirements on the department website.

Application Guidelines

Visit the department's Admissions (<http://www.colorado.edu/communication/graduate-degrees/admissions>) webpage for details.

Course Requirements

To complete the MA, students are required to take COMM 6010, at least one methods course and at least two readings courses (see tables below).

For both the thesis option and the comprehensive examination option, course work may include a maximum of 6 hours of independent study and/or internship combined. A maximum of 9 hours may be transferred from graduate work completed in/at other programs and/or institutions (including other CU campuses, such as CU Denver). A maximum of 9 credit hours of courses may be taken outside the department. Transfer and outside department courses combined may not exceed 12 credit hours. Courses in which a grade of C- or below is received are not counted toward the master's degree.

Degree Plans

Plan I: Thesis Option

Students pursuing the thesis option are required to complete a minimum of 30 graduate credit hours, including 24 credit hours of graduate-level course work (at the 5000-level or higher) and 6 thesis hours (including oral defense of the thesis; additional thesis hours cannot be taken).

Required Courses

COMM 6010	Communication Research and Theory	3
COMM 6950	Master's Thesis	6

Electives

At least one methods course:		3
COMM 6020	Quantitative Research Methods	
COMM 6030	Qualitative Research Methods	
At least two readings courses:		6
COMM 5210	Readings in Communication Theory	
COMM 5320	Readings in Rhetoric	
COMM 5425	Readings in Discourse and Social Practices	
COMM 5620	Readings in Organizational Communication	
COMM 5720	Readings in Communication and Technology	

Five additional graduate-level courses	12-15
Total Credit Hours	30-33

Students choosing the thesis option should select a permanent graduate faculty advisor prior to completing 12 credit hours. In consultation with their advisor, students should select two additional committee members and, by the beginning of the second year (assuming a course load of 9 hours per semester), complete the MA Program of Study Form and a written thesis proposal (with the thesis designed such that it can be completed during student's final planned semester in residence).

After the committee has read the thesis, a final oral defense is conducted in conformity with the graduate school's rules. Students must have an affirmative vote from the majority of committee members to pass the thesis. Students who fail the thesis defense may attempt it once more after a period of time that is determined by the committee. Students who fail the second defense are dismissed from the master's program. The final submitted thesis must comply with the CU Boulder Graduate School rules regarding the formatting of theses and dissertations.

Plan II: Comprehensive Examination Option

Students pursuing the course work with comprehensive examination option are required to complete a minimum of 30 graduate credit hours (at the 5000-level or higher), a written comprehensive examination and an oral defense of that written comprehensive examination.

Required Course

COMM 6010	Communication Research and Theory	3
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Electives

At least one methods course:		3
COMM 6020	Quantitative Research Methods	
COMM 6030	Qualitative Research Methods	
At least two readings courses:		6
COMM 5210	Readings in Communication Theory	
COMM 5320	Readings in Rhetoric	
COMM 5425	Readings in Discourse and Social Practices	
COMM 5620	Readings in Organizational Communication	
COMM 5720	Readings in Communication and Technology	
Seven additional graduate-level courses		18-21
Total Credit Hours		30-33

Master's students choosing the comprehensive examination option should select a permanent graduate faculty advisor prior to completing 12 credit hours. The associate chair of graduate studies automatically serves as a committee member. Students, in consultation with their advisor, select a third committee member.

By the beginning of the second year of graduate work (assuming a course load of 9 hours per semester), students should complete the MA Program of Study Form.

The comprehensive examination includes two standardized questions created by the associate chair of graduate studies that are completed by all master's students taking the examination at the same time that semester. One is about communication theory (90 minutes), and the other is about research methods (90 minutes). A third question, created by the student's advisor, is unique to the student's area of expertise (2 hours).

A one-hour oral defense must be held within two weeks of completing the written comprehensive examination. Students must have an affirmative

vote from the majority of committee members to pass the comprehensive examination.

Should the majority of committee members judge the written and/or oral performance unsatisfactory, students may be required to retake relevant portions of the examination (with a maximum of one opportunity to retake the examination). Prior to retaking the comprehensive examination, students may be required to complete additional course work and/or research projects. Retaking the comprehensive examination must include another oral defense. Students who retake the comprehensive examination but do not complete it in a satisfactory manner are dismissed from the master's program.

Communication - Doctor of Philosophy (PhD)

The PhD in communication typically serves students interested in pursuing an academic career. Students are admitted to the PhD program after having completed an MA degree. PhD students generally specialize in one or more of the department's three main areas:

- community & social interaction
- organizational communication
- rhetoric & culture

Depending on the extent of the student's prior academic work in communication and their rate of progress, the degree can be achieved in three to four years. PhD students are expected to complete all degree requirements within six years from the semester in which they are admitted and begin course work in the doctoral program.

Application Guidelines

For application guidelines, visit the department's Admissions (<http://www.colorado.edu/communication/graduate-degrees/admissions>) webpage.

General Requirements

All PhD students are required to take COMM 5210, COMM 6010 and two of three methods courses (COMM 5310, COMM 6020 and COMM 6030). Beyond those specific requirements, PhD students develop expertise in four areas: broad-based background in communication, advanced expertise in a primary area of specialization, expertise in a secondary area of specialization and advanced expertise in a primary methodology.

Students' individual course work requirements must be specified in a PhD plan of study document that is approved by their advisor and committee. A minimum of 54 graduate credit hours of course work is required, plus 30 hours of dissertation credit, for a minimum total of 84 credit hours. At least 30 graduate credit hours of course work must be in communication courses.

PhD students may transfer in a maximum of 12 credits from prior graduate course work. Any graduate courses completed at CU Boulder (including courses completed for the master's in communication) can be applied to the PhD program if they are included in the student's approved PhD plan of study. Students may take a maximum of nine independent study and/or internship credit hours combined.

Students wishing to pursue graduate work toward this degree should carefully read the Graduate School requirements, review the course work offered in this catalog and attend to the detailed degree requirements

on the department website (<http://www.colorado.edu/communication/graduate-degrees/phd-communication>).

Required Courses and Semester Credit Hours

Required Courses

COMM 5210	Readings in Communication Theory	3
COMM 5320	Readings in Rhetoric	3
COMM 6010	Communication Research and Theory	3
COMM 6020	Quantitative Research Methods	3
COMM 6030	Qualitative Research Methods	3

Primary Area of Specialization

This requirement is satisfied by taking courses, seminars and/or independent studies (including those outside the department) in the primary specialty declared in the student's approved PhD plan of study.

Secondary Area of Specialization

This requirement is satisfied by taking courses, seminars and/or independent studies (including those outside the department) in the student's approved PhD plan of study.

Primary Methodology

6

This requirement is satisfied by taking methodology courses in communication and/or cognate disciplines; methodological expertise also can be developed through independent studies and participation in research projects.¹

¹ The methodology may be primarily qualitative (e.g., discourse analysis, ethnography and/or rhetorical criticism) or quantitative (e.g., experimental, survey, content analysis and/or interaction analysis), or it may include a mixture of quantitative and qualitative methods. Although the PhD program requires that students choose two of the three methods courses that are offered, those seeking to claim a scholarly identity as a social scientist (as opposed to a humanist) are strongly encouraged to take both the quantitative (COMM 6020) and qualitative (COMM 6030) research methods courses.

Critical Media Practices

Critical media practices (CMDP) addresses the changing landscape of electronic media making by developing both analytical and production skills across a wide range of platforms, practices and technologies while simultaneously placing them within the broader perspective of culture and history. The department explores cross-platform media production, computational media and creative ethnography, as well as other time-based media arts practices such as locative media and performance art. Our convergent approach to media spans a variety of media tools including digital photography, audio/video editing and single camera video production, open source programming and digital single lens reflex cameras, as well as emergent tools under development. With an emphasis on the interaction between critical theory and media production practices, students are encouraged to not only thoughtfully engage with the diversity of media cultures but to also become active entrepreneurial media producers, directors, writers, editors and scholars at the forefront of emerging cultural industries. CMDP prepares students to make productive use of the tools to engage creatively with the future trajectories of media, wherever they may lead.

CMDP students will be exposed to a variety of approaches concerning the study of media, information and communication through core CMCI classes. The undergraduate program is designed to provide basic

hands-on grounding in production theory, aesthetics, techniques and approaches emphasizing innovative approaches to media making. As such, the department provides a rich and varied resource for cross-pollination and collaboration. At the graduate level, the program features a terminal MFA. The department also supports a practice-based PhD in emergent technologies and art practices. This innovative merger of theory and praxis, spanning undergraduate through graduate education, places CU on the cutting edge of institutions exploring innovative models for educating twenty-first-century students as well as publishing and disseminating scholarship.

Course code for this program is CMDP.

Master's Degree

- Interdisciplinary Documentary Media Practices - Master of Fine Arts (MFA) (p. 1291)

Doctoral Degree

- Emergent Technologies and Media Art Practices - Doctor of Philosophy (PhD) (p. 1292)

Certificate

- Emergent Technologies and Media Art Practices - Graduate Certificate (p. 1293)
- Interdisciplinary Documentary Media Practices - Graduate Certificate (p. 1293)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ambrose, Kirk T (https://experts.colorado.edu/display/fisid_115914)
Professor; PhD, University of Michigan Ann Arbor

Auguste, Reece Luke (https://experts.colorado.edu/display/fisid_149596)
Assistant Professor; PhD, Univ of Nottingham (England)

Boord, Daniel Olin (https://experts.colorado.edu/display/fisid_134649)
Professor; MFA, University of California-San Diego

Espelie, Erin Marie (https://experts.colorado.edu/display/fisid_148671)
Assistant Professor; MFA, Duke University

Ewen, Hunter P (https://experts.colorado.edu/display/fisid_152587)
Instructor; DMA, University of Colorado Boulder

Hammons, Christian Stanford (https://experts.colorado.edu/display/fisid_152915)
Instructor; PhD, University of Southern California

Mason, Gesel R (https://experts.colorado.edu/display/fisid_149966)
Assistant Professor; MFA, University of Colorado Boulder

Oakes, Timothy S. (https://experts.colorado.edu/display/fisid_109269)
Professor; PhD, University of Washington

Rivers, Julius Edwin (https://experts.colorado.edu/display/fisid_101652)
Professor; PhD, University of Oregon

Saxton, Richard W (https://experts.colorado.edu/display/fisid_144756)
Associate Professor; MFA, Indiana University Bloomington

Courses

CMDP 5100 (3) Research and Methodologies Seminar

Explores documentary media preproduction tactics and strategies, including basic research approaches, planning, pre-visualization, stylistic approaches, scheduling, working with archive and documentary materials, and documentary ethics.

Requisites: Restricted to graduate students only.

CMDP 5370 (3) Choreography, Cinematograph: Writing in Motion

Examine media and moving image aesthetics, tactic and strategies by creating work involving movement and expanded notions of choreography. Within this course students compose images and sounds, structuring them temporally as they explore narrative and non-narrative forms.

Requisites: Restricted to graduate students only.

CMDP 5450 (3) Contemporary Documentary Media

Explores cross platform documentary media practices and contemporary debates in documentary through a study of documentary history, genre, ethics and changing forms. It develops skills in critically analyzing documentary media.

Requisites: Restricted to graduate students only.

CMDP 5500 (3) Documentary Production Workshops

Workshopping and developing technical skills in documentary media production.

Requisites: Restricted to graduate students only.

CMDP 5600 (3) Documentary Lab Seminar

Explores and workshops documentary media projects and ideas from a variety of disciplines. A team-taught course, with affiliated faculty working in design groups within the documentary lab in one or more areas, such as Art and Art History, Anthropology or Geography. A total of 12 hours are required for IDMP MFA candidates.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

CMDP 5650 (3) Documentary Field Work

Explores distinctive and varied approaches to documentary field work and the uses of media for creative ethnography and other nonfiction practices. A team-taught course, with affiliated faculty from one or more areas such as Art and Art History, Anthropology and Geography.

Requisites: Requires a prerequisite course of CMDP 5100 (minimum grade C-). Restricted to graduate students only.

CMDP 5900 (3) Documentary Production Topics

Incorporates reflective study and practice in a course that consists of rotating topics in contemporary documentary practices, such as media essays, observation and participation, personal histories and voices, emergent technologies and documentary media, and interpretive ethnography.

CMDP 5910 (3) Individual Project Study

Requires students to conduct self-directed research and production in a seminar setting. Topics relate to individual projects

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CMDP 6500 (5) Producing Practicum

Explores advanced producing principles through the preproduction of the MFA thesis project, including the development of a professional project proposal.

Requisites: Requires a prerequisite course of CMDP 5650 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 6600 (5) Documentary MFA Thesis Seminar I

Explores production of MFA thesis product. Focus is on production strategies, ethical challenges and other practical production issues.

Requisites: Requires a prerequisite course of CMDP 6500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 6650 (5) Documentary MFA Thesis Seminar II

Explores editing and post-production of the MFA thesis project. Emphasizes aesthetic choices (structure, narration and music), distribution, contracts and audience.

Requisites: Requires a prerequisite course of CMDP 6600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 6841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CMDP 6871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMDP 7100 (3) Historical Overview of Media Arts and Technology

Explores a survey of historical trends in art and technology from the Renaissance to the contemporary global scene. Students investigate how artistic disciplines inform one another and how parallel developments in technology have played a significant role in the history of the arts. This course locates media arts within this broader historical context.

Grading Basis: Letter Grade

CMDP 7150 (3) Theoretical Overview of Media Arts and Technology

Surveys major theories of art, culture and technology formulated by both practitioners and theoreticians and examines conversations among technology studies, media theory and artistic practice. Students will investigate a variety of approaches, locating media arts within a broad range of theoretical perspectives.

Grading Basis: Letter Grade

CMDP 7200 (3) Research and Methodologies I

Introduces students to modalities of research and methodological practices in the context of media arts and technology. Strategies from a variety of academic disciplines will be critically engaged to provide a foundation for future work. Must be taken in sequence with CMDP 7250.

Grading Basis: Letter Grade

CMDP 7250 (3) Research and Methodologies II

Continues a discussion on modalities of research and methodological practices in the context of art and technology. Specific strategies from disciplines relating to students' individual research topics will be critically engaged to provide a foundation for future work.

Requisites: Requires a prerequisite course of CMDP 7200 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 7300 (3) Theories of the Avant-Garde

Explores various manifestations of avant-garde and experimental literature, art and media performance in the 20th century such as Cubism, Futurism, Dada, Surrealism, Theatre of the Absurd, the Situationists, Fluxus, Oulipo and others. Media forms analyzed will include manifestos, sound poetry, theatre, the novel, happenings, cinema, installation and other forms of historical avant-garde art practices.

Grading Basis: Letter Grade

CMDP 7400 (3) Contemporary Practices

Provides students with access to contemporary practices and discourses in media art and culture. The class engages professional practitioners through performances, field work and workshop encounters that may be open to the public. Students research, coordinate and present on biweekly guest presentations, with alternating weeks for reflection and discussion. Readings complement guest presentations.

Grading Basis: Letter Grade

CMDP 7410 (3) Topics in Cultures of Arts and Technology

Rotating topics in critical studies of media arts and technology.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

CMDP 7450 (3) Comprehensive Exam Seminar

Designed in a seminar format, this course reviews literature and concepts in all prior coursework and guides studies in their preparation for comprehensive exams. All ETMAP students must demonstrate their understanding of the fundamental concepts explored and developed in prior coursework in relation to individual areas of research.

Requisites: Requires prerequisite courses of CMDP 7100 and CMDP 7150 and CMDP 7250 and CMDP 7550 (all minimum grade C-).

Grading Basis: Letter Grade

CMDP 7500 (3) Production Methods I

Provides technical resources for students to work with emergent technologies in a media arts context. This is a team-taught, practice-based course addressing various production methods, from moving image and video to web and network media to computational media.

Grading Basis: Letter Grade

CMDP 7550 (3) Production Methods II

Builds on CMDP 7500 in developing technical skills with advanced new media forms. Projects are designed around students' individual areas of practice.

Requisites: Requires a prerequisite course of CMDP 7500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 7560 (3) Emergent Technologies: Theory and Practice

Explores how discreet modalities of media arts practices and their underpinning theoretical perspectives inform each other through the use of technology. Students investigate and develop theoretical perspectives on the exchange between art, technology and theory within their own research and the broader context of the contemporary social and cultural landscape.

Requisites: Requires a prerequisite course of CMDP 7150 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 7841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMDP 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMDP 7910 (3) Topics in Art and Technology: Methods and Ideas

Rotating topics on media arts practices.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

CMDP 8100 (3) Dissertation Development

Designed in a seminar format, this course guides students through the development of a practice-based dissertation in which constant critical thinking is required. Through intensive workshoping and close reading, this class guides students from the dissertation proposal to the opening stages of tangible, original research.

Grading Basis: Letter Grade

CMDP 8500 (3) Collaborative Studio Practice I

Explores approaches to media arts collaboration across disciplines. Through technological and social systems, students investigate the role of the artist. In analyzing contemporary work in an ongoing cycle of discussion, reading and art practice, students will respond to projects, texts and media in form of creative practice.

Requisites: Requires a prerequisite course of CMDP 7450 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 8510 (3) Collaborative Studio Practice II

Continues and expands the notions of collaboration across disciplines and media forms. Culminates in the public presentation of a collaborative project.

Requisites: Requires a prerequisite course of CMDP 8500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 8600 (1-6) Independent Studio Critique

Work under faculty supervision with individual and group critiques focusing on the development of a practice-based dissertation. Designed to be taken in conjunction with CMDP 8100.

Grading Basis: Letter Grade

CMDP 8991 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to graduate students only.

Interdisciplinary Documentary Media Practices - Master of Fine Arts (MFA)

The MFA in Interdisciplinary Documentary Media Practices, a terminal degree, is a three-year program. It provides graduate students with an immersive experience in documentary media practices from a variety of philosophical and cross-disciplinary perspectives involving traditional and emerging media formats.

The program's Documentary Lab gives students experience in all phases of production and fosters an environment of investigation and collaboration. By engaging students and DCMP faculty expertise with faculty from the departments of film, anthropology, media studies, art and art history and journalism, the program creates a distinctive interdisciplinary approach.

The interdisciplinary documentary media practices MFA is a three-year degree program requiring 60 credit hours of course work, with first-year,

second-year and thesis reviews, and with public presentations of work each year.

- Seven seminars are required, including Research and Methodologies, four Documentary and two MFA Thesis seminars.

Also required:

- One Production workshop
- One Production Topic
- One Documentary fieldwork course
- One Contemporary Issues in Documentary Media course
- One Media/Culture Studies elective
- One Producing Practicum
- Three self-directed research classes, under faculty supervision
- Individual Thesis Research course

Each student's thesis project will be presented in a third-year spring semester MFA Exhibition. A written thesis reflecting on the project is required. The MFA thesis project will focus on producing an intellectually rigorous and innovative contribution to documentary media. The MFA thesis project evolves throughout the course of the program as students develop their own distinct perspective.

Deadlines

Fall 2017 application deadline for USA master's applicants is Jan. 15, 2017.

Fall 2017 international application deadline for master's applicants is Dec. 1, 2016.

Application Guidelines and Resources

MFA applicants must:

- Hold at least a baccalaureate degree, or its equivalent from an accredited college or university and provide transcripts from every institution attended.
- Have an undergraduate grade-point average of at least 2.75.
- If international, provide TOEFL or IELTS scores.
- Provide three letters of recommendation.
- Provide a statement of purpose.
- Provide a portfolio of sample media work such as short video, photography, website documentary projects and audio work. Format preference is Vimeo, otherwise QuickTime files, DVD and/or links to website work.

For review and decision purposes you are required to upload an unofficial copy of your transcript(s) in the online application. We require one copy of the scanned transcript from each undergraduate and graduate institution that you attended. This includes community colleges, summer sessions, and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance, and whether or not courses were completed. **Failure to list and submit transcripts from all institutions previously attended is considered to be a violation of academic ethics and may result in the cancellation of your admission or dismissal from the university.**

ONLY after you are recommended for admission will you need to provide official transcripts.

Instructions for Uploading Unofficial Transcripts to Your Application

(http://www.colorado.edu/GraduateSchool/academics/_docs/uploading_unofficial_transcripts.pdf)

Emergent Technologies and Media Art Practices - Doctor of Philosophy (PhD)

The PhD in emergent technologies and media arts practices (ETMAP) is a practice-led program of scholarly research and exploration of media practices, theories and innovations in art and technology. By "practice-led," we mean that students both experiment with and research the media and artistic practices that they study. The ultimate goal is a substantive dissertation and media-based project that situate media art making within broad cultural and art historical perspectives.

Areas of possible research include historical and theoretical perspectives on cinema/video and performance, art historic prospective on video art and the moving image, creative nonfiction media art practices, technologies of media performance, immersive media environments and media installation, animation, expanded cinema and the integration of audio/sound technologies in relation to image production.

Requirements

Application Guidelines

PhD applicants must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university, and provide transcripts from every institution attended.
- Have an undergraduate grade-point average of at least 2.75.
- Provide the following documents:
 - TOEFL or IELTS scores (international students)
 - a statement of purpose
 - three letters of recommendation
 - a writing sample of at least 2500 words
 - a portfolio of sample media work, if applicable (e.g., short video, photography, website, media art projects and/or audio work). Format preference is Vimeo; otherwise QuickTime files, DVD and/or links to a personal website.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. We require one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Program Overview

The PhD in ETMAP is a four-year degree program requiring 72 credit hours of course work, with first-year reviews, as well as written and oral comprehensive exams and the dissertation defense.

The program consists of required course work taken over a two- or three-year period, dissertation reviews, as well as written and oral comprehensive exams and the dissertation defense (with public presentations of work each year).

A faculty advisor and committee for the comprehensive exams are chosen by the end of the fall semester of the second year, and students choose their dissertation committees by the first semester of year three.

The course work incorporating foundational investigations explores a variety of crucial areas, including a survey of historical trends in art and technology from the Renaissance to the contemporary global scene; the historical avant-garde and experimental literature, art and mixed-media performance in the twentieth century; a seminar on major theories of art and culture and technology from both practitioners and theoreticians; and project-based course work exploring how seemingly discrete modalities of media arts practices and their underpinning theoretical perspectives inform each other through the use of technology.

Course Overview

ETMAP Fundamentals (27 credits)

CMDP 7100	Historical Overview of Media Arts and Technology	3
CMDP 7500 & CMDP 7550	Production Methods I and Production Methods II	6
CMDP 7200 & CMDP 7250	Research and Methodologies I and Research and Methodologies II	6
CMDP 7300	Theories of the Avant-Garde	3
CMDP 7400	Contemporary Practices	3
CMDP 7560	Emergent Technologies: Theory and Practice	3
CMDP 7450	Comprehensive Exam Seminar	3

Dissertation Development (3 credit hours)

CMDP 8100	Dissertation Development	3
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Topics Courses, Guided Electives AND/OR Independent Study (12 credit hours)

Guided electives (within or outside the department of CMP)		
Independent study (within or outside the department of CMP)		
CMDP 7410	Topics in Cultures of Arts and Technology	
CMDP 7910	Topics in Art and Technology: Methods and Ideas	
CMDP 8600	Independent Studio Critique	

Dissertation (30 credit hours)

CMDP 8991	Doctoral Dissertation	30
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Total Credit Hours		72
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Before advancing to candidacy, all students in the ETMAP program must pass the comprehensive examination and must demonstrate their proficiency and understanding of the fundamental historical and theoretical concepts explored and developed in prior course work.

Each student's dissertation work will be presented publicly during the fifth year. Dissertations may include practical as well as written theoretical components.

Interdisciplinary Documentary Media Practices - Graduate Certificate

The Graduate Certificate in Interdisciplinary Documentary Media Practices (IDMP) is offered in conjunction with the MFA in Interdisciplinary Documentary Media Practices, which addresses the changing landscape of electronic media making by developing both analytical and production skills across a wide range of platforms, practices and technologies while simultaneously placing them within the broader perspective of culture and history.

The goal of the 12-credit-hour Graduate Certificate in IDMP is to meaningfully integrate documentary practices within the student's research and creative process. As noted ethnographic filmmaker David MacDougall argues, the immersive visual nature of these media provides ways of understanding that are not simply ancillary to text, but constitute of a different mode of knowledge. This program will be particularly germane to students in fields such as anthropology and geography where fieldwork involves the collection of audio/visual media materials. The certificate provides students with additional modalities for the presentation of research and constructing research narratives.

The certificate is open to any student pursuing a graduate degree in any department at CU-Boulder. By sharing experiences and core courses with MFA students in the department, certificate students will encounter a diverse spectrum of research interests and enrich the program's curricular environment. The MFA program is approached from a variety of philosophical and cross-disciplinary perspectives across both established and emerging digital platforms. The program's Documentary Lab offers instruction in producing, directing and scripting and fosters an environment of collaboration and research.

Requirements

Students must complete the following 12 credit hours of required course work.

Required Courses and Semester Credit Hours

Required Seminar Courses

CMDP 5100	Research and Methodologies Seminar	3
CMDP 5600	Documentary Lab Seminar	3

Required Production Workshop and Topics

CMDP 5500	Documentary Production Workshops	3
CMDP 5900	Documentary Production Topics	3

Total Credit Hours		12
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Upon completion of the program requirements, students must provide a transcript to the Department of Critical Media Practices administrative office. The transcript will be reviewed to ascertain whether the student has met the requirements. Once approved, the institute will contact the Office of the Registrar to include the certification on the student's official record. Certificates are awarded at the institute's spring celebration.

Emergent Technologies and Media Arts Practices - Graduate Certificate

The Department of Critical Media Practices (DCMP) addresses the changing landscape of electronic media-making by developing analytical and production skills across a wide range of platforms, practices and technologies while placing them within the broader perspective of

culture and history. Students pursuing the Emergent Technologies and Media Arts Practices certificate are encouraged to integrate a critical understanding of emergent media-arts practices into their research by using the cutting-edge "practice-led" approach, which includes practice as an integral part of its method. The program is open to any student pursuing a graduate degree at CU Boulder and is especially relevant for disciplines where emergent media technologies can be practiced in order to be studied, including the arts, humanities, media studies and communication.

To be accepted into the program, students must be a graduate student in good standing with the Graduate School, submit an acceptable statement of interest and successfully elaborate on that statement in an interview with the DCMP Graduate Director (daniel.boord@colorado.edu).

Requirements

Required Courses and Semester Credit Hours

Critical Studies		3
Choose one:		
CMDP 7100	Historical Overview of Media Arts and Technology	
CMDP 7150	Theoretical Overview of Media Arts and Technology	
CMDP 7200	Research and Methodologies I	
CMDP 7410	Topics in Cultures of Arts and Technology	
Practices		
CMDP 7500	Production Methods I	3
CMDP 7550	Production Methods II	3
CMDP 7560	Emergent Technologies: Theory and Practice	3
Total Credit Hours		12

Information Science

Information science considers the relationships between people, places and technology and the information those interactions yield. The internet is a broad example of a socio-technical system that is comprised of hardware and software, but in daily life is better understood as a constantly changing social infrastructure upon which complex forms of human-human and human-information interaction rest. Scholars and students of information science develop new methods to study these socio-technical phenomena, and translate those findings to the design and development of useful and meaningful technology.

The department will equip students with the conceptual machinery to succeed in a future characterized by new ways of working with information and communication technology.

The knowledge and skills of our graduates will enable them to participate in and shape new structures of enterprise. Customized, creative production—as in the "maker culture" movement—is expanding notions of the enterprise, as are distributed and mobile workforces.

The MS (under development) and PhD degrees align with standards set by other universities. Both include liberal arts education combined with empirical work and computing knowledge, and both incorporate the grant-driven, collaborative "lab model" research that characterizes the natural and engineering sciences.

Course code for this program is INFO.

Masters Degree

- Information Science - Master of Science (MS) (p. 1296)

Doctoral Degree

- Information Science - Doctor of Philosophy (PhD) (p. 1296)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Anderson, Kenneth M (https://experts.colorado.edu/display/fisid_113566)

Professor; PhD, University of California-Irvine

Barker, Lecia Jane (https://experts.colorado.edu/display/fisid_101367)
PhD, University of Colorado Boulder

Brubaker, Jed Richards (https://experts.colorado.edu/display/fisid_156193)

Assistant Professor; PhD, University of California-Irvine

Fiesler, Casey Lynn (https://experts.colorado.edu/display/fisid_155950)
Assistant Professor; PhD, Georgia Institute of Technology

Kane, Shaun Kevin (https://experts.colorado.edu/display/fisid_154603)
Assistant Professor; PhD, University of Washington

Keegan, Brian (https://experts.colorado.edu/display/fisid_158122)
Assistant Professor; PhD, Northwestern University

Larsen, Kai Rune (https://experts.colorado.edu/display/fisid_118160)
Associate Professor; PhD, SUNY at Albany

Lewis, Clayton H (https://experts.colorado.edu/display/fisid_100307)
Professor; PhD, University of Michigan Ann Arbor

Palen, Leysia A (https://experts.colorado.edu/display/fisid_114604)
Professor; PhD, University of California-Irvine

Paul, Michael J (https://experts.colorado.edu/display/fisid_156070)
Assistant Professor; PhD, Johns Hopkins University

Robinson, Rick Emery (https://experts.colorado.edu/display/fisid_156556)

Senior Instructor; PhD, University of Chicago

Szafir, Danielle N (https://experts.colorado.edu/display/fisid_156317)
Assistant Professor; PhD, University of Wisconsin-Madison

Voida, Amy Kathryn Mitchell (https://experts.colorado.edu/display/fisid_155855)

Assistant Professor; PhD, Georgia Institute of Technology

Voida, Stephen A (https://experts.colorado.edu/display/fisid_155856)
Assistant Professor; PhD, Georgia Institute of Technology

Courses

INFO 5000 (3) Introduction to Doctoral Studies in Information Science

Introduces students to practices associated with successful advancement in a doctoral program, rigorous scholarship in Information Science and more expert and early participation in their scholarly community of practice.

Grading Basis: Letter Grade

INFO 5101 (3) Theories and Concepts in Information Science

Surveys foundational theories and concepts in Information Science.

Students will learn to read and reflect critically about seminal texts, tracking their intellectual genealogies from a variety of originating disciplines to their appropriation by Information Science. Students will apply these theories to contemporary issues and problems.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.

Grading Basis: Letter Grade

INFO 5201 (3) Interdisciplinary Ways of Knowing

Introduces principles of research design and surveys the breadth of research methods appropriated by the field of information science.

Students will explore the diversity of epistemological orientations that make up the field, that influence the types of often mixed research methods applied and that shape the kinds of questions that are and are not explored.

Grading Basis: Letter Grade

INFO 5301 (3) Computation for Research in Information Science

Introduces principles of computational thinking through the manipulation, transformation and creation of data artifacts used in research. Students will be exposed to a high-level overview of algorithms, functions, data structures, recursion and object-oriented computer programming through a series of assignments that emphasize the use of computation as a means of scholarship.

Grading Basis: Letter Grade

INFO 5401 (3) Information and Ideas in Design Disciplines

Introduces principles and practices from user-centered design disciplines and examines how those principles and practices intersect with contemporary issues in information science. Theory, research and exemplary practices from interaction, graphic, product, communication and experience design are introduced through readings, problems and case histories. Project provide direct experience with common design tools and processes.

Grading Basis: Letter Grade

INFO 5501 (3) Problems in Information Science: Peer Production and Crowdsourcing

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations. Problems in Information Sciences is a series that brings contemporary research to the classroom in the form of progressive, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3501

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

INFO 5502 (3) Problems in Information Science: Online Communities

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3502

Grading Basis: Letter Grade

INFO 5503 (3) Problems in Information Science: Everyday Information Behavior

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information on line. Students learn to analyze the informational dimensions that occur in their everyday lives.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3503

Grading Basis: Letter Grade

INFO 5504 (3) Problems in Information Science: Digital Identity

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. "Problems in Information Science" is a series that brings contemporary research to the classroom in the form of progress, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3504

Grading Basis: Letter Grade

INFO 5505 (3) Problems in Information Science: Designing for Creativity and Learning

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3505

Grading Basis: Letter Grade

INFO 5601 (3) Ethical and Policy Dimensions of Information, Technology and New Media

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4601

Grading Basis: Letter Grade

INFO 5602 (3) Mastery in Information Science: Information Visualization

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4602

Grading Basis: Letter Grade

INFO 5603 (3) Mastery in Information Science: Survey Research Design

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4603

Grading Basis: Letter Grade

INFO 5604 (3) Applied Machine Learning

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4604

Grading Basis: Letter Grade

INFO 5605 (3) Mastery: Ethnographic Research in Applied Settings

Familiarizes students with ethnography as a research tool as it is used in corporate and consulting research. Systematically explores issues and topics in research for the purposes of product design and development.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4605

Grading Basis: Letter Grade

INFO 5611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4611

Grading Basis: Letter Grade

INFO 5841 (1-3) Independent Study

Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

INFO 5871 (3) Special Topics

Topics will vary by semester.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

INFO 5931 (1-3) Internship

Internship

Repeatable: Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**INFO 6101 (3) Theories and Concepts in Information Science**

Surveys foundational theories and concepts in information science. Students will learn to read and reflect critically about seminal texts, tracing their intellectual genealogies from a variety of originating disciplines to their appropriation by information science. Students will apply these theories to contemporary issues and problems.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.**Grading Basis:** Letter Grade**INFO 6201 (3) Interdisciplinary Ways of Knowing**

Introduces principles of research design and surveys the breadth of research methods appropriated by the field of information science. Students will explore the diversity of epistemological orientations that make up the field, that influence the types of often mixed research methods applied and that shape the kinds of questions that are and are not explored.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.**Grading Basis:** Letter Grade**INFO 6301 (3) Computation for Research in Information Science**

Introduces principles of computational thinking through the manipulation, transformation and creation of data artifacts used in research. Students will be exposed to a high level overview of algorithms, functions, data structures, recursion and object oriented computer programming through a series of assignments that emphasize the use of computation as a means of scholarship.

Grading Basis: Letter Grade**INFO 6401 (3) Information and Ideas in Design Disciplines**

Introduces fundamental principles and practices from user-centered design disciplines and examines how those principles and practices intersect with contemporary issues in information science. Theory, research and exemplary practices from interaction, graphic, product, communication and experience design are introduced through readings, problems and case histories. Projects provide direct experience with common design tools and exposure to leading practitioners.

Grading Basis: Letter Grade**INFO 6500 (1) Information Science Seminar**

Enculturates graduate students in the discipline of Information Science through weekly seminar series that hosts guest speakers, internal faculty and graduate speakers and other community building and professional development activities.

Repeatable: Repeatable for up to 8.00 total credit hours.**Grading Basis:** Letter Grade**INFO 6871 (3) Special Topics**

Topics will vary by semester.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**INFO 7000 (3) Introduction to Doctoral Studies in Information Science**

Introduces students to practices associated with successful advancement in a doctoral program, rigorous scholarship in information science and more expert and early participation in their scholarly community of practice.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.**Grading Basis:** Letter Grade**INFO 7841 (1-3) Independent Study**

Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to PhD students only.**INFO 7871 (3) Special Topics**

Topics will vary by semester.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to PhD students only.**INFO 8991 (1-10) Dissertation**

Dissertation.

Repeatable: Repeatable for up to 40.00 total credit hours.**Requisites:** Restricted to PhD students only.

Information Science - Master of Science (MS)

The MS in information science is currently under development. It is anticipated that the program will begin in fall 2018, and applications will be accepted beginning in July 2017.

For the most up-to-date information, visit the college's Information Science Graduate Degrees (<http://www.colorado.edu/cmci/academics/information-science/graduate-degrees>) webpage.

Information Science - Doctor of Philosophy (PhD)

Information science examines all forms of human-data interaction. The discipline considers the relationships between people, places and technology.

The internet is a broad example of a socio-technical system that is comprised of hardware and software, but in daily life is better understood as a constantly changing social infrastructure upon which complex forms of human-human and human-information interaction rest. Information science scholars and students develop new methods to study, such socio-technical phenomena.

The PhD program offers an education that combines training in the liberal arts, empirical investigation and computing knowledge, and incorporates the grant-driven, collaborative "lab model" research that characterizes the natural and engineering sciences.

Requirements

Application Guidelines

PhD applicants must:

- Hold at least a bachelor's degree or its equivalent.

- Have an undergraduate GPA of at least 3.2 and graduate GPA of 3.5, if any prior graduate course work was taken.
- Provide the following documents:
 - a CV or resume
 - an unofficial transcript from each college or university attended
 - scores from the general GRE; international students must also have a TOEFL score of at least 600 (IBT 100)
 - three letters of recommendation from people qualified to judge the student's potential for success in graduate school (Note: The most compelling recommendation letters will provide specific observations about the candidate's promise in analytical thinking, oral and written scientific communication, and research and teaching, as well as demonstration of teamwork and collegiality)
 - a statement of purpose (two pages maximum) that describes a question, problem or topic in information science the student has a passion to address; explains how the student's previous academic training, professional experience and/or personal passions led them to this question, problem or topic and drew them to this degree program; and identifies the faculty members with whom the student is interested in working and why
 - optional: a writing sample in addition to the statement of purpose

We encourage applications from individuals representing the broad range of disciplines that bring fundamental skills and insights to bear on the range of issues related to understanding and shaping a future of information science as envisioned above. However, all students admitted to the program will be expected to develop a breadth of competencies (including empirical, computational and designerly competencies) that are essential to being a researcher in this diverse, interdisciplinary field. One's ability and willingness to expand skill sets should be demonstrated in the statement of purpose.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. We require one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Required Courses and Semester Credit Hours

Required Courses

INFO 7000	Introduction to Doctoral Studies in Information Science	3
INFO 6101	Theories and Concepts in Information Science	3
INFO 6201	Interdisciplinary Ways of Knowing	3
INFO 6301	Computation for Research in Information Science	3
INFO 6401	Information and Ideas in Design Disciplines	3
INFO 65XX	Methods in Information Science ¹	3

INFO 6500	Information Science Seminar (eight 1-credit sessions)	8
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Specialization Courses

Twelve credit hours of graduate-level elective course work must be taken. Elective specialization courses can be within or outside of INFO, under the guidance of the student's advisor and committee.	12
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Total Credit Hours	38
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¹ Multiple 5000- and 6000-level methods courses will be offered that offer deep dives into various quantitative, qualitative and mixed methods in Information Science. Students must take one methods course in addition to INFO 6201 to fulfill the core requirements.

Additional Courses Offered at the Graduate Level

INFO 5501	Problems in Information Science: Peer Production and Crowdsourcing	3
INFO 5601	Ethical and Policy Dimensions of Information, Technology and New Media	3
INFO 5602	Mastery in Information Science: Information Visualization	3
INFO 5603	Mastery in Information Science: Survey Research Design	3
INFO 5604	Applied Machine Learning	3
INFO 5605	Mastery: Ethnographic Research in Applied Settings	3

Intermedia Art, Writing and Performance

The intermedia art, writing and performance (IAWP) program is an interdisciplinary digital arts and humanities research unit with a practice-based PhD. Faculty investigate past and present forms of digital art, writing and performance, offering graduate students an environment in which to practice and research emerging forms of creativity.

Course code for this program is IAWP.

Doctoral Degree

- Intermedia Art, Writing and Performance - Doctor of Philosophy (PhD) (p. 1298)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Amerika, Mark (https://experts.colorado.edu/display/fisid_116523)
Professor; MFA, Brown University

Carr, Julia Alice (https://experts.colorado.edu/display/fisid_143349)
Associate Professor; PhD, University of California-Berkeley

Emerson, Lori Ann (https://experts.colorado.edu/display/fisid_145834)
Associate Professor; PhD, SUNY at Buffalo

Swanson, Joel E. (https://experts.colorado.edu/display/fisid_134311)
Assistant Professor; MFA, University of California-San Diego

Courses

IAWP 6000 (3) Introduction to Practice-Based Research

Introduces students to practice-based research methods in intermedia art, writing and performance.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

IAWP 6100 (3) Theory and Practice of Doing

Introduces students to the theory of doing and making. Guiding questions include: what does it mean to place "doing" at the center of one's research agenda? What does it mean to do hands-on work in an art/design studio, a digital humanities lab, a media lab, a media archaeology lab, a makerspace or a hackerspace?

Equivalent - Duplicate Degree Credit Not Granted: ENGL 5529

Grading Basis: Letter Grade

IAWP 6200 (3) Intermedia Collaboratory

Collaborative studio course in which students focus on emerging practices in intermediate art, writing and performance while collaboratively building art, writing and/or performance projects that are presented to the community as public events and programs including exhibitions, publications and performances.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

IAWP 6700 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

IAWP 6800 (3) Intermedia Seminar

Focuses on intermedia arts, writing and performance as they relate to digital media, communication and information.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

Grading Basis: Letter Grade

IAWP 6871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

IAWP 7841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

IAWP 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

IAWP 8991 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 40.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Intermedia Art, Writing and Performance - Doctor of Philosophy (PhD)

The research conducted in the program reflects the rapidly transforming knowledge systems and digital media economies emerging from the

substantial technological shifts currently taking place in our society. Digital creative work and critical media literacy play a defining role in our information society and are transforming all aspects of contemporary life, including the way many professional visual artists, multimedia performers, writers, publishers, digital humanists and archivists pursue their practice.

Traditional scholarly and creative work outputs, such as the single-authored print book or conventional gallery exhibitions, have already been challenged by the emergence of multi-authored and/or hybridized forms of transmission such as Internet art sites, electronic literature, live audio/visual performance, multi-platform storytelling or transmedia narratives, software art, interactive installations for public spaces, augmented reality, game art, networked media activism and innovative art applications for mobile devices and tablets.

The Department of Intermedia Art, Writing and Performance's internationally renowned and affiliated faculty collaborate with graduate students to probe the significance of a digitally expanded, process-based research environment located in a cluster of interdisciplinary research labs. The program provides a flexible pedagogical structure that will lead to the creation of new and hybridized forms of art, writing, performance, scholarship, theory, design, curation, exhibition and publication appropriate for our current cultural moment.

The program concentrates its curriculum on digital forms of creativity so as to cultivate cutting-edge investigations into the practice, theory, history and philosophy of media and its relationships to creativity, communication, technology and information.

Requirements

Application Guidelines

Applicants to the PhD program in intermedia art, writing and performance (IAWP) are expected to hold a master's degree (MFA or MA preferred) or its equivalent from an accredited college or university, and must provide transcripts from every institution attended. In exceptional cases, applicants without a master's degree may be considered for admission.

The program encourages applications from interdisciplinary digital artists and/or humanists who have already started developing experimental modes of practice-based research in contemporary forms of artistic expression.

Domestic applications must be received by the program no later than Jan. 15 prior to the fall semester for which entrance is sought. International applications should be submitted by Dec. 1. Late applications may be considered under special circumstances.

Successful applicants typically meet or exceed the following criteria:

- Provide transcripts from all institutions the applicant has attended as an undergraduate and graduate.
- Have an undergraduate cumulative GPA of at least 3.2 and a cumulative GPA of at least 3.5 in previous graduate work.
- Provide three letters of recommendation.
- Provide a 1000-word artist statement and proposal for a practice-based research project.
- Provide a resume or CV that includes academic and employment experience.
- Provide a portfolio of intermedia artwork, such as Internet art sites, electronic literature, video and/or film work, sound works, digital humanities projects, creative writing, mobile and web applications,

etc. Format preference is web-based and could include links to Vimeo, Soundcloud, online publication and/or exhibition sites, PDFs, personal websites, etc. DVDs or flash drives with QuickTime files, images, texts, etc., are also accepted.

Meeting these criteria does not guarantee acceptance into the program. The program accepts relatively few new doctoral students each fall; qualified applicants may exceed available openings.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. The program requires one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Program Overview

Doctoral students in the IAWP PhD program take 30 credit hours of required course work in the first two years of the program, followed by 30 dissertation credit hours, for a total of 60 hours.

The required course work will include an interdisciplinary set of IAWP classes that introduces students to collaborative, practice-based research processes in the digital arts and humanities. The course work includes Introduction to Practice-Based Research (IAWP 6000), Intermedia Collaboratory (IAWP 6200), Theory and Practice of Doing (IAWP 6100) and the Intermedia Seminar (IAWP 6800). Students are also encouraged to take approved courses offered by departments inside and outside the College of Media, Communication and Information.

At the end of their second year, students will take their general examination. Once they have passed the general examination, their research will focus on the creation of an original and substantial project centered on practice-based research. The final outcome of their research will result in a creative work accompanied by a written dissertation.

Time Limit

Students are expected to complete the program and their practice-based research project in four years.

Journalism

The Department of Journalism is founded on the principle that a well-informed and engaged public is essential to democracy—perhaps more so now, at a time of dizzying change, than it has ever been; and that, in the face of this change, journalism retains a unique role in contributing to civic life and to the quality of public discourse.

We put this principle to work by helping students become constructive participants in an ever-evolving global media landscape, where distinctions between producers and consumers of content have blurred. More specifically, we prepare them, at both the undergraduate and

graduate levels, for careers in journalism and other fields of public communication. We train students to gather information from a diversity of sources, to analyze it critically, and to report what is significant through stories and other media forms across multiple media platforms. We encourage ethical awareness so that students will think independently, being prepared to reflect on and to help shape media practices and norms rather than take them at face value.

We believe in the integration of classroom instruction with practical experience. Many of our students work for, and manage, campus online news and entertainment sites, television programs and a radio station. They intern at broadcast stations, newspapers, magazines, websites and social media companies. Lastly, as a faculty, and with the help of colleagues elsewhere in our College who are working on new and innovative forms of human communication, we are committed to improving journalism through pioneering research and creative work.

Course code for this program is JRNL.

Master's Degree

- Journalism - Master of Arts (MA) (p. 1302)

Doctoral Degree

- Media Research and Practice - Doctor of Philosophy (PhD) (p. 1303)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ackland, Len
Professor Emeritus

Brinkman, P. Delbert
Professor Emeritus

Browne, Jeffrey William (https://experts.colorado.edu/display/fisid_153439)
Instructor; MEd, University of Florida

Daugherty, Paul J (https://experts.colorado.edu/display/fisid_128801)
Senior Instructor; MA, University of Colorado Boulder

Ferrucci, Patrick Richard (https://experts.colorado.edu/display/fisid_156307)
Assistant Professor; PhD, University of Missouri-Columbia

Jones, Stephen B (https://experts.colorado.edu/display/fisid_101578)
Senior Instructor; PhD, University of Utah

Kaplan, Frank L.
Professor Emeritus

Kim, Hun Shik (https://experts.colorado.edu/display/fisid_141126)
Associate Professor; PhD, University of Missouri-Columbia

Kodas, Michael George (https://experts.colorado.edu/display/fisid_147577)
Instructor; BS, University of Missouri-Columbia

Kuczun, Sam
Professor Emeritus

McDevitt, Michael Joseph (https://experts.colorado.edu/display/fisid_122949)
Professor; PhD, Stanford University

Mcnamara, Mei-Ling J (https://experts.colorado.edu/display/fisid_158310)
Assistant Professor; PhD, Univ of Edinburgh (Scotland)

Moritz, Marguerite J.
Professor Emeritus; PhD, Northwestern University

Raybon, Patricia
Professor Emeritus

Ryan, Kathleen Marie (https://experts.colorado.edu/display/fisid_148481)
Associate Professor; PhD, University of Oregon

Skewes Cummings, Elizabeth (https://experts.colorado.edu/display/fisid_122724)
Associate Professor; PhD, Syracuse University

Voakes, Paul S (https://experts.colorado.edu/display/fisid_130279)
Professor; PhD, University of Wisconsin-Madison

Whitt, Jan (https://experts.colorado.edu/display/fisid_103027)
Professor; PhD, University of Denver

Yulsman, Thomas H (https://experts.colorado.edu/display/fisid_109386)
Professor; MS, Columbia University In the City of New York

Courses

JRNL 5001 (3) Media Technology Boot Camp

Offers a foundation in the technologies of journalistic storytelling across a variety of established and emerging media platforms, such as print, television, radio, online publications, blogs, social media and emerging forms of communication. Students will emerge from the course with basic competence in the technical tools they will need as journalists.

Requisites: Restricted to graduate students only.

JRNL 5011 (3) Newsgathering and Multimedia Storytelling

Develops skills in research and reporting on public issues and news events, and in the construction of narrative in the journalistic and documentary traditions, using a variety of media platforms.

Requisites: Restricted to graduate students only.

JRNL 5102 (3) Photojournalism Portfolio

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4102

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5344 (3) Video Documentary Production

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4344

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5502 (3) Newsgathering 2

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4502

Requisites: Requires prerequisite courses of JOUR 5511 and JRNL/JOUR 5552 (all minimum grade C-). Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5512 (3) In-Depth Reporting

Shows how to dig beneath the surface of issues and events. Focuses on research, interviewing, and writing.

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5514 (3) Newsgathering for Television

Teaches advanced principles and techniques involved in the preparation of news for broadcasting.

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5521 (3) Precision Journalism

Instructs students in data-driven investigative reporting. Includes hands-on, in-depth instruction in gathering data from census reports, commercial databases, global information networks, and other sources, and utilizing spreadsheets to analyze the information in ways that can help deepen and strengthen journalistic stories on a wide variety of subjects.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5552 (3) News Editing

Discusses principles and practice in copy editing and writing headlines for local and wire stories. Practice in page makeup, picture editing, and electronic editing.

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5562 (3) Digital Journalism

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4562

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5602 (3) Opinion Writing

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4602

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5624 (4) News Team

Students participate in Newsteam Boulder a program broadcast live over the Boulder cable television system.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4624

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5634 (1-3) Broadcast Projects

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Prepares radio or television documentaries and informational/entertainment programs. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4634

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5651 (3) Journalism Law & Ethics

Explores the legal and ethical frameworks of journalistic practice and media production. Covers historical as well as current frameworks used in examining the legal and ethical issues that arise in newsgathering and publication. Examines the relationships between ethics and the law in various media context.

Requisites: Restricted to graduate students only.

JRNL 5684 (3) Advanced Camera and Editing

Emphasizes the advanced techniques in digital video camera usage and digital editing for professional broadcast video production.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4684

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

JRNL 5702 (3) Arts/Cultural Reporting and Criticism

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4702

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5802 (3) Feature Writing

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4802

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5812 (3) Science Writing

Helps students acquire the basic skills and knowledge required of science journalists. Also examines issues of scientific importance such as climate change, the nature of scientific knowledge, and how science is covered in various media.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5822 (3) Reporting on the Environment

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4822

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5841 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5851 (1-6) Graduate Professional Project

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5871 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5872 (1-3) Special Topics: Print

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4872

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5874 (1-3) Special Topics: Electronic Media

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Journalism (JRNL) graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5931 (1-3) Internship

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 6321 (3) Literary Journalism

Analyzes the work of journalists who became some of the greatest fiction writers of the 19th and 20th centuries, and examines the increasingly indistinct lines between journalism and narrative fiction.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 6651 (3) Media Law

Graduate seminar in communications law. Studies changing law and applied legal research techniques.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 6871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

JRNL 6940 (1) Master's Degree Candidate**Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**JRNL 7001 (3) Theories of Journalism Studies**

Introduces the principal concepts, literature and theoretical and paradigmatic perspectives of journalism studies, and explores their ties and contributions to parallel domains in the social sciences and humanities.

Requisites: Restricted to graduate students only.**JRNL 7002 (3) Journalism Research Design**

Adopts a holistic and creative approach to bridging theory with method for the purpose of research design. Students explore designs that effectively address research questions through elaboration of theoretical and operational linkages.

Requisites: Requires prerequisite courses of JRNL 7001 and MDRP 7051 and MDRP 7061 (all minimum grade C-). Restricted to graduate students only.**MDRP 6201 (3) Global Media and Culture**

Explores the historical, cultural, social, political and economic dimensions of media systems in various parts of the world and their relationship with technological and cultural processes. Aims to provide a critical overview of the profound changes in media and culture in today's digitally connected/disconnected world. Formerly MDST 6201.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 6671 (3) Media, Myth, and Ritual**

Explores cultural practices of media audiences. Addresses theoretical and methodological implications of studying audiences from a culturalist perspective, with particular focus on media audience practices. Students engage in field research projects related to course content. Formerly MDST 6671.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 6871 (1-3) Special Topics**

Special topics. May be repeated up to 15 total credit hours

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 7001 (1) PhD Colloquium Series**

Introduce the new doctoral students to the Media Research and Practice program and its faculty members and their research. The colloquium series will also include workshops on program planning, publishing, attending conferences, writing a dissertation, preparing and presenting a job talk, etc.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.**Grading Basis:** Pass/Fail**MDRP 7011 (3) Proseminar in Media Communication Theory 1**

Introduces the principal concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7011.

Requisites: Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD) only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7021 (3) Proseminar in Media and Communication Theory 2**

Continues the introduction of principle concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7021.

Requisites: Requires prerequisite course of MDRP 7011 (minimum grade C-). Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD).**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7051 (3) Qualitative Research Methods in Media**

Examines various methods of qualitative data gathering and analysis in the mass and social media context. Formerly CMCI 7051.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7061 (3) Quantitative Research Methods in Media**

Examines various methods of quantitative data gathering methods and analysis in the mass media context. Formerly CMCI 7061.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7841 (1-6) Independent Study**

Independent study.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 7871 (3) Special Topics**

Special topics.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 8991 (1-10) Doctoral Dissertation**

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to graduate students only.

Journalism - Master of Arts (MA)

The master's degree in journalism prepares students for professional success in news outlets, digital and social media platforms, and corporate communications.

The program offers two options, both of which are designed for students with limited academic or professional experience in journalism.

The professional practice option is for students who wish to focus on quickly obtaining advanced journalistic skills. It can be completed with as few as 30 credits and in as little as two semesters plus a summer.

The area of expertise option is for students wishing not only to acquire advanced journalistic skills, but also to complement them with an area of expertise, such as environmental science and policy. This option can be completed with a minimum of 36 credits and in four semesters.

Regardless of option, the degree's focus is on multimedia training and experience. Students develop skills in information-gathering, storytelling and analysis across a variety of platforms and professional contexts, including video, online interactivity, social media, photography and, of course, the printed word. They produce in-depth reporting projects in collaboration with professional media outlets in Colorado, and they complete internships at award-winning radio and television stations,

newspapers, magazines, websites and other news organizations nationwide.

Requirements

Application Guidelines

Applicants to the MA in journalism must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university.
- Have an undergraduate grade point average of at least 2.75.
- Have a GRE verbal score of at least 153 (62%). International applicants must also have a TOEFL score of at least 600 (IBT 100).
- Provide three letters of recommendation.
- Provide a 500-word statement of purpose.
- Provide a resume.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Program Requirements

Professional Practice Option

This option can be completed with a minimum of 30 credits and in as little as two semesters plus a summer.

Required Courses

JRNL 5001	Media Technology Boot Camp ¹	3
JRNL 5011	Newsgathering and Multimedia Storytelling ¹	3
JRNL 5521	Precision Journalism	3
JRNL 5651	Journalism Law & Ethics	3

Journalism Electives

Select two or three elective courses in journalism. 6-9

CMCI Electives

Select two elective courses outside journalism, but within CMCI. 6

Capstone Courses

Choose two of the following: 6

JRNL 5931	Internship	
JRNL 5851	Graduate Professional Project	
JRNL 5872	Special Topics: Print (CU News Corps)	

Total Credit Hours 30-33

¹ May be waived depending on the student's professional experience.

Area of Expertise Option

This option can be completed with a minimum of 36 credits and in four semesters.

Required Courses

JRNL 5001	Media Technology Boot Camp ¹	3
JRNL 5011	Newsgathering and Multimedia Storytelling ¹	3
JRNL 5521	Precision Journalism	3
JRNL 5651	Journalism Law & Ethics	3

Journalism Electives

Select two elective courses in journalism. 6

CMCI Electives

Select four elective courses in the chosen area of expertise. 12

Capstone Courses

Choose two of the following: 6

JRNL 5931	Internship	
JRNL 5851	Graduate Professional Project	
JRNL 5872	Special Topics: Print (CU News Corps)	

Total Credit Hours 36

¹ May be waived depending on the student's professional experience.

Media Research and Practice - Doctor of Philosophy (PhD)

The media research and practice PhD program is dedicated to interdisciplinary inquiry into the social, political, economic and cultural dimensions of media, strategic communication and journalism, both nationally and internationally, and in historical and contemporary contexts.

The degree combines the research and teaching emphases of the three participating departments – advertising, public relations and design (APRD), journalism (JRNL) and media studies (MDST) – and encourages doctoral students to develop research agendas that bridge disciplines and cross between academic research and professional practice.

Because media and communication are central to social and individual life, to commerce, to understanding social change and supporting social justice, and to the health of democratic politics, the MDRP degree draws from a wide range of fields and disciplines, including anthropology, political science, cultural studies, sociology, philosophy, history, linguistics, economics, business, psychology, literature, law and public policy.

The interdisciplinary nature of media research and practice is reflected in the range of faculty research and professional practice in the media and communication industries. The program fosters theoretical and practical understanding about how media innovations serve various forms of mass and public communication, including strategic communication, journalism, entertainment industries, and the creation and maintenance of local, national and transnational social networks. In addition to rigorous training in research and teaching, the degree program emphasizes the importance of young scholars developing the skills to share their scholarship in a variety of arenas of public life.

Students receive training in media theory, as well as qualitative and quantitative research methods, and take courses inside and outside the three departments and the college.

The program strives to produce graduates who demonstrate intellectual leadership, nationally and internationally, in the area(s) of research specialization they choose and/or pioneer, and an interest in and aptitude for generating public awareness and conversation about their scholarship.

An important part of doctoral students' education is their participation in the college's research and teaching missions through their assignments as research assistants, teaching assistants and instructors.

Requirements

Application Guidelines

Applicants to the PhD program in media research and practice are expected to hold a master's degree or have completed equivalent

graduate work. In exceptional cases, applicants without a master's degree may be considered for admission.

Individuals are encouraged to apply if their record and interests promise success in the program, and they aspire to actively engage in scholarly investigation of media and communication.

Completed domestic applications must be received by the program no later than Jan. 1 prior to the fall semester for which entrance is sought. International applications should be submitted by Dec. 1. Late applications may be considered under special circumstances.

Successful applicants typically meet or exceed the following criteria:

- Have a Graduate Record Examination (GRE) score of at least 301 (1100 pre 2011) on verbal and quantitative combined. International applicants must also have a TOEFL score of 625 (IBT 106).
- Have an undergraduate cumulative GPA of at least 3.2 and a cumulative GPA of at least 3.5 in previous graduate work.
- Provide three letters of recommendation, with at least two being academic references.
- Provide a 700-word statement of purpose.
- Provide a resume or CV that includes academic and employment experience.
- Provide a writing sample that exhibits the ability to undertake the conceptual and empirical studies required of doctoral students (e.g., a chapter from a master's thesis or graduate-level term paper).

Meeting these criteria does not guarantee acceptance into the program. The program accepts relatively few new doctoral students each fall; qualified applicants may exceed available openings.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. The program requires one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Program Requirements

All three departments have the same structure of requirements. For a list of graduate course offerings, visit the college's PhD in Media Research and Practice (<http://www.colorado.edu/cmci/academics/media-studies/phd-media-studies>) webpage.

Core Courses (14 credit hours)

Proseminar	6
Qualitative research methods	3
Quantitative Research Methods	3
Colloquium	2

Additional Courses (60 credit hours)

Advanced research methods	3
One additional advanced methods or media practice course	3
Inside emphasis	15
Outside emphasis	9
Dissertation hours	30
Total Credit Hours	74

Time Limit

Students are expected to complete the program and defend the dissertation in four years.

Media Studies

Contemporary media practitioners, both professional and amateur, influence the values and behaviors of national and global populations, challenging and shaping the authority, legitimacy and control exercised by governments and other powerful social institutions. Because of this, media and cultural studies are central to research about the complex intersections of culture, politics and economics from the local to the global levels. Appropriately, the Department of Media Studies emphasizes the history, nature and impact of mediated sounds, images and texts from a wide range of inter- and cross-disciplinary perspectives.

The Department of Media Studies examines ways of thinking about and conducting research into the intersection of media, communication and cultural practices in both historical and contemporary perspectives. Encompassing humanistic, social scientific and artistic approaches to the study of media and culture, and interdisciplinary in its theoretical and methodological approaches, the degree spans traditional boundaries between theory and practice. It fosters media "literacy" in the broadest sense by providing students with critical skills to analyze contemporary media and culture, along with technical, aesthetic and intellectual principles that facilitate strong media practices.

Course code for this program is MDRP and MDST.

Master's Degree

- Media and Public Engagement - Master of Arts (MA) (p. 1308)

Doctoral Degree

- Media Research and Practice - Doctor of Philosophy (PhD) (p. 1303)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Ahmed, Alaa Abdalla (https://experts.colorado.edu/display/fisid_144736)
Associate Professor; PhD, University of Michigan Ann Arbor

Bergquist, Marcelo R (https://experts.colorado.edu/display/fisid_144022)
Senior Instructor/Instructor Adjunct

Borden, Mark A (https://experts.colorado.edu/display/fisid_148514)
Associate Professor; PhD, University of California-Davis

Branch, Melvyn C.
Professor Emeritus

Bright, Victor Mark (https://experts.colorado.edu/display/fisid_112696)
Professor; PhD, Georgia Institute of Technology

Brower, Timothy L (https://experts.colorado.edu/display/fisid_147553)
Senior Instructor; PhD, Colorado State University

Carlson, Lawrence E.
Professor Emeritus

Castro, Francisco (https://experts.colorado.edu/display/fisid_147992)
Instructor; PhD, University of Colorado Boulder

Daily, John W (https://experts.colorado.edu/display/fisid_100131)
Professor; PhD, Stanford University

Datta, Subhendu K.
Professor Emeritus

Ding, Yifu (https://experts.colorado.edu/display/fisid_146088)
Associate Professor; PhD, University of Akron

Dunn, Martin L (https://experts.colorado.edu/display/fisid_103706)
Professor; PhD, University of Washington

Ferguson, Virginia Lea (https://experts.colorado.edu/display/fisid_110131)
Associate Professor; PhD, University of Colorado Boulder

Geers, Thomas L.
Professor Emeritus

George, Steven (https://experts.colorado.edu/display/fisid_103289)
Professor; PhD, University of California-Berkeley

Greenberg, Alan R.
Professor Emeritus

Hamlington, Peter Edward (https://experts.colorado.edu/display/fisid_149800)
Assistant Professor; PhD, University of Michigan Ann Arbor

Hannigan, Michael P. (https://experts.colorado.edu/display/fisid_122655)
Associate Professor; PhD, California Institute of Technology

Henze, Daven Ker (https://experts.colorado.edu/display/fisid_144858)
Associate Professor; PhD, California Institute of Technology

Hertzberg, Jean R (https://experts.colorado.edu/display/fisid_105315)
Associate Professor; PhD, University of California-Berkeley

Humbert, James Sean (https://experts.colorado.edu/display/fisid_156202)
Associate Professor; PhD, California Institute of Technology

Kassoy, David R.
Professor Emeritus

Keplinger, Christoph Matthias (https://experts.colorado.edu/display/fisid_156421)
Assistant Professor; PhD, Johannes Kepler University Linz (Austria)

Knutsen, Jeffrey Steven (https://experts.colorado.edu/display/fisid_145534)
Instructor; PhD, University of Colorado Boulder

Kotys-Schwartz, Daria (https://experts.colorado.edu/display/fisid_144738)

Senior Instructor; PhD, University of Colorado Boulder

Kreith, Frank
Professor Emeritus

Lee, Se-Hee (https://experts.colorado.edu/display/fisid_144739)
Professor; PhD, Seoul Nat Univ (Korea)

Lee, Yung-Cheng (https://experts.colorado.edu/display/fisid_103170)
Professor; PhD, University of Minnesota Twin Cities

Li, Baowen (https://experts.colorado.edu/display/fisid_156203)
Professor; PhD, Carl von Ossietzky Universitat Oldenburg (Germany)

Long, Rong (https://experts.colorado.edu/display/fisid_151301)
Assistant Professor; PhD, Cornell University

Maute, Kurt Karl (https://experts.colorado.edu/display/fisid_113875)
Professor; PhD, Univ of Stuttgart (Germany)

McNeill, Nathan John (https://experts.colorado.edu/display/fisid_151518)
Instructor; PhD, Purdue University

Milford, Jana (https://experts.colorado.edu/display/fisid_103268)
Professor; PhD, Carnegie Mellon University

Miller, Shelly Lynn (https://experts.colorado.edu/display/fisid_110394)
Professor; PhD, University of California-Berkeley

Murray, Todd W (https://experts.colorado.edu/display/fisid_146549)
Associate Professor; PhD, Johns Hopkins University

Neu, Corey P (https://experts.colorado.edu/display/fisid_156210)
Associate Professor; PhD, University of California-Davis

Norris, Jan Adam (https://experts.colorado.edu/display/fisid_101412)
Lecturer; PhD, University of Colorado Boulder

Pellegrino, John (https://experts.colorado.edu/display/fisid_130902)
Research Professor; PhD, University of Colorado Boulder

Raj, Rishi (https://experts.colorado.edu/display/fisid_108413)
Professor; PhD, Harvard University

Reamon, Derek T (https://experts.colorado.edu/display/fisid_120538)
Senior Instructor; PhD, Stanford University

Rentschler, Mark Edwin (https://experts.colorado.edu/display/fisid_146091)
Associate Professor; PhD, University of Nebraska-Lincoln

Rieker, Gregory Brian (https://experts.colorado.edu/display/fisid_151727)
Assistant Professor; PhD, Stanford University

Ruben, Shalom D (https://experts.colorado.edu/display/fisid_149492)
Instructor; PhD, University of California-Los Angeles

Steinbrenner, Julie Elizabeth (https://experts.colorado.edu/display/fisid_152041)
Instructor; PhD, Stanford University

Stoldt, Conrad R (https://experts.colorado.edu/display/fisid_126290)
Professor; PhD, Iowa State University

Stowell, Michael (https://experts.colorado.edu/display/fisid_124136)
Associate Professor; PhD, California Institute of Technology

Tan, Wei (https://experts.colorado.edu/display/fisid_141464)
Associate Professor; PhD, University of Illinois at Chicago

Van Zeghbroeck, Bart J (https://experts.colorado.edu/display/fisid_104113)
Professor; PhD, University of Colorado Boulder

Vance, Marina Eller (https://experts.colorado.edu/display/fisid_158217)
Assistant Professor; PhD, Virginia Polytechnic Institute and State Univ

Vasilyev, Oleg V. (https://experts.colorado.edu/display/fisid_126641)
Professor; PhD, University of Notre Dame

Vernerey, Franck J. (https://experts.colorado.edu/display/fisid_144760)
Associate Professor; PhD, Northwestern University

Weidman, Patrick D.
Professor Emeritus

Xiao, Jianliang (https://experts.colorado.edu/display/fisid_149777)
Assistant Professor; PhD, Northwestern University

Yang, Ronggui (https://experts.colorado.edu/display/fisid_142640)
Professor; PhD, Massachusetts Institute of Technology

Yin, Xiaobo (https://experts.colorado.edu/display/fisid_153484)
Assistant Professor; PhD, Stanford University

Zable, Jack
Professor Emeritus

Courses

MDST 5001 (3) Connected Media Practices

Provides a crucial frame through which students understand the evolution of film, television and gaming in the digital era. Explores an impending revolution in how screen media are created, circulated and consumed. Relates to a larger trend across the media industries to integrate digital technology and socially networked communication with traditional screen media practices.

Requisites: Restricted to graduate students only.

MDST 5002 (3) Media Activism and Public Engagement

Explores politics of media activism. Relies on survey of existing theory and scholarship on media activism and close analyses of activist practices within both old and new media and on local, national and global scale. Special attention paid to questions of relativity and efficacy and value of media activism as both aesthetic and political activity.

Requisites: Requires a prerequisite course of MDST 5001 (minimum grade C-). Restricted to graduate students only.

MDST 5211 (3) Asian Media and Culture

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

Equivalent - Duplicate Degree Credit Not Granted: MDST 4211

Requisites: Restricted to graduate students only.

MDST 5311 (3) Mass Communication Criticism

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

Equivalent - Duplicate Degree Credit Not Granted: MDST 4311

MDST 5331 (3) Gender, Race, Class, and Sexuality in Popular Culture

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 5841 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MDST 5851 (1-6) Graduate Professional Project

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MDST 5871 (3) Special Topics

Special topics in Media Studies.

Requisites: Restricted to graduate students only.

MDST 5931 (1-3) Internship

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

MDST 6071 (3) Critical Theories of Media and Culture

Introduces students to critical theories and analysis of media and popular culture. Examines major theoretical traditions and/or theorists that significantly inform media studies (e.g., culturalism, structuralism, Marxism, critical theory, feminism, psychoanalysis, post-structuralism) and applies these to media analysis and criticism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6211 (3) Communication and International Development

Studies and analyzes communications technologies and techniques used in addressing social problems in developing countries.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6301 (3) Communication, Media, and Concepts of the Public

Introduces students to historical and contemporary uses of fundamental concepts in research and theory about media institutions, particularly public, community, mass, publicity, public space, public opinion, public interest, and the public sphere.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6311 (3) Power, Politics and Mediated Culture

Examines various literatures that consider the role of power in shaping social orders and the social beings that constitute that order and the place of media in both processes.

Requisites: Restricted to graduate students only.

MDST 6341 (3) Children, Youth and the Media

Examines the concepts of children and childhood from the historical, social, cultural, economic and political perspectives, this course explores the interaction between mass media and the socialization and cultivation process of children and youth. Multiple theoretical traditions are used as a framework to study a variety of issues related to children and the media.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6551 (3) Media and Communication Policy

Surveys historical and contemporary developments in media and communications policy, emphasizing social and cultural dimensions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6711 (3) Media and Popular Culture

Introduces fundamental methods for understanding the construction of meaning in film, television, popular music and advertising. Traces the study of popular culture through film theory, mass media analysis and cultural studies. Surveys various strands of research that seek to understand popular culture and its effects.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6771 (3) History of Media and Communication

Examines history of communication, including the means (technologies) of communication, social practices (institutional, collective, individual) that intersect with the study of communication and media, and cultural forms (texts, products). Situates the study of media, technology, and culture within historical contexts, comparative historical research, media archaeology, genealogy and media history.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6781 (3) Economic and Political Aspects of Media

Examines economic problems and political issues relevant to media institutions and industries.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Broadcast Journalism

MDST 6951 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 6201 (3) Global Media and Culture

Explores the historical, cultural, social, political and economic dimensions of media systems in various parts of the world and their relationship with technological and cultural processes. Aims to provide a critical overview of the profound changes in media and culture in today's digitally connected/disconnected world. Formerly MDST 6201.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 6671 (3) Media, Myth, and Ritual

Explores cultural practices of media audiences. Addresses theoretical and methodological implications of studying audiences from a culturalist perspective, with particular focus on media audience practices. Students engage in field research projects related to course content. Formerly MDST 6671.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 6871 (1-3) Special Topics

Special topics. May be repeated up to 15 total credit hours

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MDRP 7001 (1) PhD Colloquium Series

Introduce the new doctoral students to the Media Research and Practice program and its faculty members and their research. The colloquium series will also include workshops on program planning, publishing, attending conferences, writing a dissertation, preparing and presenting a job talk, etc.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

MDRP 7011 (3) Proseminar in Media Communication Theory 1

Introduces the principal concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7011.

Requisites: Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD) only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 7021 (3) Proseminar in Media and Communication Theory 2

Continues the introduction of principle concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7021.

Requisites: Requires prerequisite course of MDRP 7011 (minimum grade C-). Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD).

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 7051 (3) Qualitative Research Methods in Media

Examines various methods of qualitative data gathering and analysis in the mass and social media context. Formerly CMCI 7051.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 7061 (3) Quantitative Research Methods in Media

Examines various methods of quantitative data gathering methods and analysis in the mass media context. Formerly CMCI 7061.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDRP 7841 (1-6) Independent Study

Independent study.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MDRP 7871 (3) Special Topics

Special topics.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MDRP 8991 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to graduate students only.

Media and Public Engagement - Master of Arts (MA)

The Master of Arts in media and public engagement (MAPE) trains critical advocates for social change. It is a two-year, interdisciplinary program that spans traditional boundaries between theory and practice, offering opportunities for critical study of the history, institutions, economics and social implications of the media, both nationally and globally. It also offers practice-based media training geared toward civic engagement and community building. In addition to completing courses in media theory and other fields of interest, students learn how to create thoughtful and engaging projects using a variety of media practices, including online platforms, multimedia documentary, social media campaigns and other kinds of tools both longstanding and cutting-edge.

During their two years in the program, MAPE students will collaborate with faculty, community leaders, nonprofit organizations and companies to devise innovative interventions for social change. They may also choose to complete one of several subject-area certificate programs available through the university, such as the graduate certificate in environment, policy and society (p. 978) (EPS), which consists of 18 credit hours met by taking courses both inside and outside CMCI.

The MAPE prepares students for entering and transforming a variety of professions, both at the national and international level, in government, media, public relations, cultural organizations and the nonprofit sector.

Requirements

Application Guidelines

Students are admitted to the program based on the quality of their proposed project and their commitment to social change and the public good. Applicants to the MA in media and public engagement must:

- Hold at least a baccalaureate degree or its equivalent from an accredited college or university.
- Have an undergraduate grade point average of at least 2.75.
- Have a GRE verbal score of at least 153 (62%). International applicants must also have a TOEFL score of at least 600 (IBT 100).
- Provide three letters of recommendation.

- Provide a 500-word statement of purpose.
- Provide a resume.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Program Requirements

Students in the MAPE program take a total of 30 credit hours, comprised of:

- 24 hours of course work selected from a range of courses offered by the Media Studies department and/or courses crosslisted with other departments inside and outside the College of Media, Communication and Information (CMCI)
- 6 hours for a thesis project

Required Courses and Semester Credit Hours

Required Foundation Courses

CMCI 6051	Media Theories	3
MDST 5001	Connected Media Practices	3
MDST 5002	Media Activism and Public Engagement	3

Additional Requirements

Methods of media practice and/or research. ¹	6	
Electives in the student's area of emphasis. ²	9	
MDST 6951	Master's Thesis	6
Total Credit Hours	30	

¹ Could consist of an internship or practicum.

² Students may take a wide range of electives, including graduate seminars in media studies, hands-on courses throughout CMCI and topical offerings throughout the university.

Media Research and Practice - Doctor of Philosophy (PhD)

The media research and practice PhD program is dedicated to interdisciplinary inquiry into the social, political, economic and cultural dimensions of media, strategic communication and journalism, both nationally and internationally, and in historical and contemporary contexts.

The degree combines the research and teaching emphases of the three participating departments – advertising, public relations and design (APRD), journalism (JRNL) and media studies (MDST) – and encourages doctoral students to develop research agendas that bridge disciplines and cross between academic research and professional practice.

Because media and communication are central to social and individual life, to commerce, to understanding social change and supporting social justice, and to the health of democratic politics, the MDRP degree draws from a wide range of fields and disciplines, including anthropology, political science, cultural studies, sociology, philosophy, history, linguistics, economics, business, psychology, literature, law and public policy.

The interdisciplinary nature of media research and practice is reflected in the range of faculty research and professional practice in the media and communication industries. The program fosters theoretical and practical understanding about how media innovations serve various forms of mass and public communication, including strategic

communication, journalism, entertainment industries, and the creation and maintenance of local, national and transnational social networks. In addition to rigorous training in research and teaching, the degree program emphasizes the importance of young scholars developing the skills to share their scholarship in a variety of arenas of public life.

Students receive training in media theory, as well as qualitative and quantitative research methods, and take courses inside and outside the three departments and the college.

The program strives to produce graduates who demonstrate intellectual leadership, nationally and internationally, in the area(s) of research specialization they choose and/or pioneer, and an interest in and aptitude for generating public awareness and conversation about their scholarship.

An important part of doctoral students' education is their participation in the college's research and teaching missions through their assignments as research assistants, teaching assistants and instructors.

Requirements

Application Guidelines

Applicants to the PhD program in media research and practice are expected to hold a master's degree or have completed equivalent graduate work. In exceptional cases, applicants without a master's degree may be considered for admission.

Individuals are encouraged to apply if their record and interests promise success in the program, and they aspire to actively engage in scholarly investigation of media and communication.

Completed domestic applications must be received by the program no later than Jan. 1 prior to the fall semester for which entrance is sought. International applications should be submitted by Dec. 1. Late applications may be considered under special circumstances.

Successful applicants typically meet or exceed the following criteria:

- Have a Graduate Record Examination (GRE) score of at least 301 (1100 pre 2011) on verbal and quantitative combined. International applicants must also have a TOEFL score of 625 (IBT 106).
- Have an undergraduate cumulative GPA of at least 3.2 and a cumulative GPA of at least 3.5 in previous graduate work.
- Provide three letters of recommendation, with at least two being academic references.
- Provide a 700-word statement of purpose.
- Provide a resume or CV that includes academic and employment experience.
- Provide a writing sample that exhibits the ability to undertake the conceptual and empirical studies required of doctoral students (e.g., a chapter from a master's thesis or graduate-level term paper).

Meeting these criteria does not guarantee acceptance into the program. The program accepts relatively few new doctoral students each fall; qualified applicants may exceed available openings.

For review and decision purposes, students are required to upload an unofficial copy of their transcript(s) in the online application. The program requires one copy of the scanned transcript from each undergraduate and graduate institution attended. This includes community colleges, summer sessions and extension programs. While credits from one institution may appear on the transcript of a second institution, unofficial transcripts

must be submitted from each institution, regardless of the length of attendance and whether courses were completed.

Failure to list and submit transcripts from all institutions previously attended is considered a violation of academic ethics and may result in the cancellation of admission or dismissal from the university.

Only after a student is recommended for admission will they need to provide official transcripts.

Graduate advising is available by phone (303-492-7977), email (cmcigrad@colorado.edu) or in person (Hellems 96D).

Program Requirements

All three departments have the same structure of requirements. For a list of graduate course offerings, visit the college's PhD in Media Research and Practice (<http://www.colorado.edu/cmci/academics/media-studies/phd-media-studies>) webpage.

Core Courses (14 credit hours)

Proseminar	6
Qualitative research methods	3
Quantitative Research Methods	3
Colloquium	2

Additional Courses (60 credit hours)

Advanced research methods	3
One additional advanced methods or media practice course	3
Inside emphasis	15
Outside emphasis	9
Dissertation hours	30
Total Credit Hours	74

Time Limit

Students are expected to complete the program and defend the dissertation in four years.

Music

The College of Music provides specialized training designed to prepare students for a variety of careers in music. The college offers three undergraduate degrees, three certificate programs and four graduate degrees; numerous performance opportunities are also available.

Established by the Regents of the University of Colorado in 1920, the College of Music is a fully accredited member of the National Association of Schools of Music.

Mission

The mission of the College of Music at CU Boulder is to promote excellence in music through distinguished instruction in performance, composition, musicology, theory and teacher preparation, and to provide opportunities for performance, creative activities, research and scholarship, and teaching.

The college is dedicated to:

- providing music majors and non-majors the opportunity to develop their knowledge, understanding and ability in the various aspects of music at a level appropriate to their needs and interests;

- preparing students for careers as performers, composers, scholars, teachers, administrators and other professionals in the field of music;
- broadening and deepening the knowledge and understanding of music through research, teaching, creative activities and publication; and
- enriching the lives of students and faculty as well as the community, state, nation and the world with performances of a wide variety of music presentations and publications.

The College of Music is an academic community committed to maintaining a climate of mutual respect and collegiality.

The widely varied functions of music in the world today present many challenging and interesting opportunities for teachers, performers, creative artists, technicians and commercial personnel. While these different pursuits require specialized emphases, the faculty of the College of Music recognize the musical and educational experiences that are common to all. Therefore, each curriculum of the College of Music is designed to present music as an integrated whole. Solo performance and technique, ensemble performance, historical and theoretical studies, concert and recital opportunities and elective courses both inside and outside the college are intended to give students a balanced approach to musical understanding and musicianship.

The Entrepreneurship Center for Music is a national leader in professional development for musicians. The ECM equips today's music students with the skills and tools they need to create sustainable careers in the arts. ECM students are encouraged to develop entrepreneurial skills to explore the vast opportunities inherent in a changing marketplace, and to develop plans to implement career-enhancing ventures across the artistic spectrum. Offerings include courses for credit, an undergraduate Certificate in Music Entrepreneurship, workshops and internships with a wide range of arts organizations and businesses nationwide.

The College of Music has several beautiful performance halls, including the 2,000-seat Macky Auditorium, the 500-seat Grusin Music Hall, the 270-seat Music Theatre and the 120-seat Chamber Hall. The college is located primarily in the Warner Imig Music Building, a large complex of practice rooms, faculty studios, offices, ensemble rehearsal areas, seminar facilities and classrooms. An addition to the east side of the building features a 4,300 square foot rehearsal space with a 35-foot ceiling and acoustical draping. Additional rehearsal and classroom facilities are located in Macky.

The college's outstanding Howard B. Waltz Music Library is considered to be among the nation's most comprehensive. The library contains over 150,000 volumes, scores, recordings and periodicals. Computerized facilities are provided for listening to recordings and work stations are available for computer-based reference searching.

The college also features extensive facilities for music technology and electronic music study. The Computer-Assisted Music Laboratories (I and II) are multi-purpose labs designed primarily for classroom instruction. They feature numerous workstations, each with a Musical Instrument Digital Interface, sampling keyboard and a computer. The CRUNCH Lab is a fully-featured electronic music project studio. This lab is optimized for computer music research (including live interactive performance systems), as well as sound recording and editing projects and audio/video production. The Class Piano Laboratory is equipped with 12 digital pianos.

Each year the College of Music presents over 400 concerts by students, faculty and guests. In addition to individual musical pursuits, students

at all levels have the opportunity to perform in a variety of outstanding ensembles including orchestras, choirs, bands, world music ensembles, chamber and early music groups, jazz ensembles and combos, opera productions and musicals. Many of these groups have been invited to perform at prestigious national and international events. Recitals by students and faculty are supplemented by visits from world-class guest artists, all of which provide the Boulder community with the chance to hear some of the finest music being performed today. The vast majority of these excellent performances are free and open to the public.

Other music programs presented by CU Presents include:

- Artist Series
- Eklund Opera Program
- Takács Quartet Series
- Holiday Festival

For a schedule of all College of Music performances, call 303-492-8008 or visit [colorado.edu/music](http://www.colorado.edu/music) (<http://www.colorado.edu/music>).

Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

The student body of the College of Music has its own government, represented by the College of Music Student Government and the Graduate Music Student Council. Honorary music fraternities are Sigma Alpha Iota, Mu Phi Epsilon and Kappa Kappa Psi. Pi Kappa Lambda, a national music honor society, and the Music Teachers National Association both have active chapters within the College of Music. Music education majors are eligible for membership in student chapters of the National Association for Music Educators, the American Choral Directors Association and the American String Teachers Association. Additional organizations include CU Trombone Society, CU Trumpet Alliance and Diverse Musicians Alliance.

Policies & Requirements

Honors at Graduation

Students achieving a cumulative GPA of 3.70–3.79 graduate with honors, 3.80–3.89 with high honors and 3.90–4.00 with highest honors. These students are recognized at commencement.

Scholarships and Awards

A number of scholarships and awards are designed specifically for students in the College of Music. Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory degree progress by:

1. demonstrating adequate performance in weekly applied lessons, ensemble and scholarship auditions, applied proficiencies/juries, and recitals/previews,
2. maintaining at least a 3.0 cumulative grade point average in those classes that count toward the music degree and
3. successfully completing at least two-thirds of the credit hours attempted while a music major at CU-Boulder.

Graduate students must enroll as full-time students, maintaining a 3.00 GPA, and make adequate progress toward their degrees. The college offers approximately 100 graduate assistantships as well as graduate fellowships and a variety of endowed scholarships for graduate students.

Academic Ethics

Students are expected to conduct themselves in accordance with the highest standards of honesty and integrity. Cheating, plagiarism, illegitimate possession and disposition of examinations, alteration, forgery, or falsification of official records and similar acts or the attempt to engage in such acts are grounds for suspension or expulsion from the university.

In particular, students are advised that plagiarism consists of any act involving the offering of the work of someone else as their own. It is recommended that students consult with their instructors as to the proper preparation of reports, papers, etc., in order to avoid this and similar offenses. Students are expected to be acquainted with and abide by provisions of the University of Colorado Boulder Honor Code.

Scholastic Requirements

To remain in good academic standing, a student must maintain at least a 2.00 cumulative grade point average (GPA) and make satisfactory progress toward the degree as defined by the College of Music and area faculty.

Academic probation is an official warning that a student's grades are unsatisfactory. Any undergraduate student who has a cumulative or semester grade point average below 2.00 is automatically placed on probation for the following three semesters. (Cumulative grade point average is calculated on grades earned at this university.) If a probationary student's grade point averages (semester and cumulative) at the end of any probationary semester and the cumulative probationary period are not 2.00 or above, automatic suspension results. Any undergraduate student who has a cumulative or semester grade point average below 1.00 also is automatically suspended without a probationary period.

While on suspension, students may not register for regular day classes during the fall or spring semester on any CU campus and are not considered eligible for graduation. To regain good academic standing, suspended students must earn a semester GPA of 2.00 or higher and raise their cumulative GPA to 2.00 or above during the following term by successfully completing at least 12 credit hours (with no withdrawals, no incomplete grades, and no courses taken pass/fail) through the Division of Continuing Education and Professional Studies or summer session.

Courses taken at other campuses or institutions will not be used for purposes of reinstatement, but credits earned may be transferred according to normal procedures and policies after reinstatement and readmission. Suspended students who raise their cumulative GPA to 2.00 or above may then petition for readmission and receive a personal hearing before the associate dean. Suspended students who do not raise their cumulative GPA to 2.00 or above are dismissed from the college and university. Students who have been dismissed must reapply for admission to the university after being reinstated by the college.

Undergraduate music majors are eligible for scholarships or renewal of their scholarships as long as they make satisfactory progress in their major (as determined by the faculty), demonstrate satisfactory proficiency in jury exams and auditions, enroll in ensemble and maintain a minimum cumulative GPA of 3.00. Students who have a cumulative GPA below 3.00 will be placed on scholarship probation for a maximum of two semesters (consecutive or cumulative), provided the GPA improves each semester. Students on scholarship probation who do not earn a

cumulative GPA of 3.00 or higher by the end of the probationary period will have their scholarships revoked.

Appeals

Students have the right to appeal decisions of academic dishonesty and to petition for exceptions to the academic policies stated in this catalog. Appeals should be directed to the Associate Dean for Undergraduate Studies. College of Music policies are in addition to the campus policies.

Admission Requirements

Admission requirements for specific degree programs that supplement the Graduate School requirements are discussed in the degree program descriptions that follow. Students are urged to take the general (verbal, quantitative, analytical) portions of the Graduate Record Examination (GRE). GRE scores are required as part of the application to the PhD programs and MM in music theory, and they are recommended for the DMA programs and Master of Music Education degree.

Preliminary Examinations

Just before the beginning of their first semester of work toward a master's or doctoral degree, students are given preliminary exams covering the major field, several areas of music theory and music history. Specific requirements vary with the student's degree and program. Students pursuing the master's and doctoral degrees in voice also must pass proficiency requirements in piano and diction (English, French, German and Italian).

Results from the major-field examination serve as one basis for recommending specific course work in the program. The major-field examination in musicology includes essay questions, score analysis and identification of terms. Conducting majors should be knowledgeable in areas of repertoire, score analysis and conducting techniques. Performance majors are examined in the areas of technique, repertoire, stylistically informed performance and pedagogy. Students enrolled in the master's degree in Jazz Performance and Pedagogy must demonstrate knowledge of jazz theory and history and jazz keyboard proficiency.

College Teaching and Professional Development

Most graduate degrees in music require coursework in music pedagogy. Students who plan to teach at the college level are urged to be involved in the many offerings of CU Boulder's renowned Graduate Teacher Program. Workshops, observations, consultations, and other professional development opportunities are scheduled throughout the academic year. These include campus-level offerings as posted at the Graduate Teacher Program (<http://www.colorado.edu/gtp>) website, as well as music-specific events organized by the Lead TAs in the College of Music. The GTP offers three certificates that graduate students may pursue during their studies at CU Boulder: the Certificate in College Teaching (CCT), Professional Development Certificate for Preparing Future Faculty (PDC:PFF) (<http://www.colorado.edu/gtp/certificates/professional-development-certificate-preparing-future-faculty>), and Professional Development Certificate for Preparing Future Professionals in Business, Government, Industry and the Arts (PDC:BGIA). For details, see Graduate Teacher Program Certificates (<http://www.colorado.edu/gtp/certificates>).

Financial Aid

In addition to the opportunities for financial aid described in the Graduate School section, the College of Music grants merit aid in the form

of teaching assistantships and graduate part-time instructorships (GPTI) to numerous graduate students each year. The assistantships and instructorships, which are usually one-quarter time (25 percent), include both a stipend and the waiver of 5 or 6 credit hours of tuition each semester. There are also scholarships offered by the individual departments and external fellowships awarded through the Graduate School. All prospective students who have completed their applications by December 1 will automatically be considered for available scholarships and assistantships.

English Language Requirements

A student who is noticeably deficient in the use of the English language may not obtain an advanced degree from the University of Colorado. Satisfaction of this requirement depends not so much upon ability to pass formal tests, although these may be required, as upon the consistent use of good English in all oral and written work.

Therefore, the TOEFL exam is required of ALL international graduate applicants whose native language is not English. *This includes applicants who have already completed a degree or studied in an English-speaking country for any length of time.* An acceptable score must be reported directly to the CU Boulder Office of Admissions by the December 1 deadline in order for the applicant to be considered.

The College of Music has an additional requirement that all admitted students whose language is not English are required to take an English placement exam with the English as a Second Language (ESL) department upon arrival on campus and to abide by the recommendations made.

Graduate Auditions

Auditions are required for all performance and performance/pedagogy programs. A personal audition is strongly preferred, but students may be accepted into most programs by submitting a recorded audition. Note that some studios require a preliminary, recorded audition before a student may be invited to schedule an audition on campus. For specific information and audition dates, refer to the Prospective Graduate Students Auditions (<http://www.colorado.edu/music/admissions/prospective-graduate-students/auditions>) website or contact the office of the associate dean for graduate studies at 303-492-2207 or gradmusic@colorado.edu.

Programs of Study

Music

The College of Music's renowned faculty will guide you through the Master of Music, Doctor of Philosophy in music, or professional certificate programs, while a variety of ensembles are available for honing performance skills.

Visit the College of Music (<http://www.colorado.edu/music>) website for more information about the school, academics, ensembles and more.

Master's Degree

- Music - Master of Music (MMus) (p. 1322)

Doctoral Degree

- Music - Doctor of Philosophy (PhD) (p. 1323)

Certificates

- Opera and Solo Vocal Performance - Graduate Certificate (p. 1324)
- String Quartet Performance - Graduate Certificate (p. 1324)
- Woodwind Performance - Graduate Certificate (p. 1324)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaholm, Philip
Professor Emeritus

Austin, James R (https://experts.colorado.edu/display/fisid_103455)
Professor; PhD, University of Iowa

Bernstein, Giora
Professor Emeritus

Bird-Arvidsson, Jennifer (https://experts.colorado.edu/display/fisid_147651)
Associate Professor; MM, University of Michigan Ann Arbor

Brody, James M (https://experts.colorado.edu/display/fisid_101948)
Associate Professor; MM, Indiana University Bloomington

Bruns, Steven M (https://experts.colorado.edu/display/fisid_103483)
Associate Professor; PhD, University of Wisconsin-Madison

Caballero, Carlo (https://experts.colorado.edu/display/fisid_111681)
Associate Professor; PhD, University of Pennsylvania

Carthy, Nicholas R. (https://experts.colorado.edu/display/fisid_135356)
Associate Professor/Instructor; BA, Guildhall School of Music, London (England)

Chang, Philip C (https://experts.colorado.edu/display/fisid_143541)
Senior Instructor; MA, University of Rochester

Chellis, Matthew Wren (https://experts.colorado.edu/display/fisid_154415)
Assistant Professor; MM, Manhattan School of Music

Conlon, Joan Catoni
Professor Emeritus

Cooper, Peter W. (https://experts.colorado.edu/display/fisid_134522)
Senior Instructor

Cooperstock, Andrew B (https://experts.colorado.edu/display/fisid_115393)
Professor; DMA, Peabody Institute of Johns Hopkins University

Cremaschi, Alejandro M. (https://experts.colorado.edu/display/fisid_134168)
Associate Professor; DMA, University of Minnesota Twin Cities

Davis, John S (https://experts.colorado.edu/display/fisid_115443)
Professor; DMA, University of Northern Colorado

Dockendorf, Matthew Paul (https://experts.colorado.edu/display/fisid_154511)
Instructor; MM, Ohio State University

Drumheller, John E (https://experts.colorado.edu/display/fisid_103707)
Senior Instructor; DMA, University of Colorado Boulder

Dunn, James M (https://experts.colorado.edu/display/fisid_140593)
Associate Professor; DMus, Arizona State University

Dusinberre, Edward (https://experts.colorado.edu/display/fisid_101358)
Assoc Professor Attendant RankArtist in Residence

Eakin, Charles
Professor Emeritus

Eckert, Erika L (https://experts.colorado.edu/display/fisid_101844)
Associate Professor; BM, University of Rochester

Eddy, Marjorie Alexandra (https://experts.colorado.edu/display/fisid_111634)
Lecturer

Ellsworth, Oliver
Professor Emeritus

Erhard, Paul M (https://experts.colorado.edu/display/fisid_100493)
Professor; DMA, The Juilliard School

Farr, Elizabeth G (https://experts.colorado.edu/display/fisid_101732)
Professor; DMA, University of Michigan Ann Arbor

Fejer, Andras (https://experts.colorado.edu/display/fisid_103923)
Artist in Residence

Fink, Robert
Professor Emeritus

Galm, John
Professor Emeritus

Gentry, Gregory R (https://experts.colorado.edu/display/fisid_151707)
Associate Professor; DMA, University of Missouri-Kansas City

Gonzalez, Luis
Professor Emeritus

Goode, Bradley M. (https://experts.colorado.edu/display/fisid_134686)
Associate ProfessorInstructor; MM, DePaul University

Graham, Larry
Professor Emeritus

Gunther, John G (https://experts.colorado.edu/display/fisid_141165)
Associate Professor; PhD, New York University

Hata, Kuniaki
Professor Emeritus

Hayes, Deborah
Professor Emeritus

Hayghe, Jennifer C (https://experts.colorado.edu/display/fisid_155969)
Associate Professor; DMA, The Juilliard School

Holman-Johnson, Leigh (https://experts.colorado.edu/display/fisid_141980)
Associate Professor; DMA, University of Colorado Boulder

Ishikawa, Yoshiyuki (https://experts.colorado.edu/display/fisid_102125)
Professor; DMA, University of Michigan Ann Arbor

Jackson, Dennis
Professor Emeritus

Jennings, Christina A (https://experts.colorado.edu/display/fisid_143545)
Associate Professor; MM, The Juilliard School

Kearns, William
Professor Emeritus

Keister, Jay (https://experts.colorado.edu/display/fisid_115734)
Associate Professor; PhD, University of California-Los Angeles

Kellogg, Daniel Dixon (https://experts.colorado.edu/display/fisid_141124)
Associate Professor; DMA, Yale University

Kim, Suyeon (https://experts.colorado.edu/display/fisid_153470)
LecturerInstructor

Korevaar, David J (https://experts.colorado.edu/display/fisid_118374)
Professor; DMA, The Juilliard School

Lehnert, Doris Pridonoff
Professor Emeritus

Lehnert, Oswald
Professor Emeritus

Leong, Daphne (https://experts.colorado.edu/display/fisid_115747)
Associate Professor; PhD, University of Rochester

Lewis, Gary J (https://experts.colorado.edu/display/fisid_145854)
ProfessorInstructor; MM, Texas Tech University

Lin, Hsiao-Ling (https://experts.colorado.edu/display/fisid_149958)
Instructor; MM, DePaul University

Malin, Jonathan (https://experts.colorado.edu/display/fisid_151714)
Associate Professor; PhD, University of Chicago

Maloy, Rebecca (https://experts.colorado.edu/display/fisid_125582)
ProfessorAssociate Professor; PhD, University of Cincinnati

Mason, Patrick C (https://experts.colorado.edu/display/fisid_101840)
Professor; MM, University of Nebraska-Lincoln

McCarthy, Kevin
Professor Emeritus

McDonald, Margaret M (https://experts.colorado.edu/display/fisid_134703)
Associate Professor; DMA, University of California-Santa Barbara

McKee, Paul (https://experts.colorado.edu/display/fisid_154465)
Associate Professor; MM, University of Texas at Austin

McKinney, Donald J (https://experts.colorado.edu/display/fisid_152974)
Associate Professor; DMA, University of Michigan Ann Arbor

Moteki, Mutsumi (https://experts.colorado.edu/display/fisid_100992)
Professor; DMA, University of Michigan Ann Arbor

Myer, Tom R (https://experts.colorado.edu/display/fisid_100922)
Associate Professor; MM, East Texas State University

Nguyen, Alexandra (https://experts.colorado.edu/display/fisid_145847)
Associate Professor; DMA, University of Rochester

Nims, Abigail Andrews (https://experts.colorado.edu/display/fisid_152977)
Assistant Professor; MM, Westminster Choir College

Nytch, Jeffrey C. (https://experts.colorado.edu/display/fisid_147341)
Associate Professor; DMA, Rice University

Okigbo, Austin Chinagorom (https://experts.colorado.edu/display/fisid_151507)
Assistant Professor; PhD, Indiana University Bloomington

Pann, Carter N (https://experts.colorado.edu/display/fisid_141461)
Associate Professor; DMA, University of Michigan Ann Arbor

Peterson, Patti H (https://experts.colorado.edu/display/fisid_101502)
Associate Professor; DMA, University of Colorado Boulder

Pinkow, David
Professor Emeritus

Ramsey, Andrea L (https://experts.colorado.edu/display/fisid_154420)
Assistant Professor; PhD, Michigan State University

Reger, Jeremy J (https://experts.colorado.edu/display/fisid_156224)
Instructor; DMA, University of Michigan Ann Arbor

Requiro, David (https://experts.colorado.edu/display/fisid_155785)
Associate ProfessorAssistant Professor; MM, University of Michigan Ann Arbor

Rhodes, Harumi B (https://experts.colorado.edu/display/fisid_155971)
Associate ProfessorAssistant Professor; Not Listed, New England Conservatory of Music

Riis, Thomas L (https://experts.colorado.edu/display/fisid_100723)
Professor; PhD, University of Michigan Ann Arbor

Roeder, Matthew J (https://experts.colorado.edu/display/fisid_120180)
Associate Professor; DMA, University of Colorado Boulder

Romero, Brenda M (https://experts.colorado.edu/display/fisid_106117)
Associate Professor; PhD, University of California-Los Angeles

Sable, Barbara Kinsey
Professor Emeritus

Sampsel, Laurie (https://experts.colorado.edu/display/fisid_101802)
Professor; MLS, Kent State University

Sawchuk, Terry M (https://experts.colorado.edu/display/fisid_102477)
Associate Professor; MM, University of Michigan Ann Arbor

Schranz, Karoly (https://experts.colorado.edu/display/fisid_103924)
Assoc Professor Attendant RankArtist in Residence

Scott, F. Wayne
Professor Emeritus

Shay, Robert S. (https://experts.colorado.edu/display/fisid_154671)
Professor; PhD, University of North Carolina Chapel Hill

Silver, Daniel S (https://experts.colorado.edu/display/fisid_115564)
Associate Professor; MM, University of Michigan Ann Arbor

Smith, Jeremy L (https://experts.colorado.edu/display/fisid_118265)
ProfessorAssociate Professor; PhD, University of California-Santa Barbara

Spera, Nicolo Ruggero Ferruccio (https://experts.colorado.edu/display/fisid_148406)
Assistant Professor; DMA, University of Colorado Boulder

Spillman, Robert
Professor Emeritus

Stanley, William J (https://experts.colorado.edu/display/fisid_103616)
Associate Professor; DMA, University of Illinois at Urbana-Champaign

Swadener, Marc
Professor Emeritus

Teitelbaum, Benjamin Raphael (https://experts.colorado.edu/display/fisid_151338)
Assistant Professor; PhD, Brown University

Theodore, Michael (https://experts.colorado.edu/display/fisid_113318)
Associate Professor; PhD, University of California-San Diego

Thornton, Michael Robert (https://experts.colorado.edu/display/fisid_116318)
Associate Professor; BM, Temple University

Walter, Douglas W (https://experts.colorado.edu/display/fisid_101811)
Professor; DMA, Temple University

Walther, Geraldine E (https://experts.colorado.edu/display/fisid_142000)
Artist in Residence

Waters, Keith John (https://experts.colorado.edu/display/fisid_107518)
Professor; PhD, University of Rochester

Wetherbee, Charles Tyler (https://experts.colorado.edu/display/fisid_151515)
Assistant Professor; BM, Curtis Institute of Music

Wolzien, Charles
Professor Emeritus

Courses

MUSC 5002 (3) Proseminar in Historical Musicology

Prepares students to pursue independent research in the history of music. Meeting as a seminar, the course focuses on the nature of evidence, methods and tools of research, and theoretical or historiographic issues.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4011

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4012 and MUEL 4012

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the styles. Offered fall terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5026 (2) Percussion Literature

In-depth investigation of major original solo works for percussion, significant ensemble literature including chamber and large ensembles, and selected transcriptions. Instructor consent required.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5036 (2) Brass Literature

Investigates major original solo works for trumpet, horn, trombone, euphonium, and tuba, and ensemble literature including chamber and large settings. Offered every other spring term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5041 (2) Advanced Orchestration

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5061 (3) Advanced Tonal Analysis

Surveys tonal repertory and analytical techniques. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5071 (3) Post-tonal Theory and Analysis I

Focuses on theory and analysis of post-tonal literature pre-1945. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4078

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite piano majors.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5081 (3) Applications in Music Technology

Presents advanced strategies for applying computer technology in music creation. Synthesis, DSP, MIDI and audio sequencing, as well as advanced music engraving, will be explored through the use of various software platforms including Logic, Reason, MAX and Finale. Offered fall term only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5091 (3) Contemporary Theory - Jazz and Modal Music

Studies the composition and improvisation of Herbie Hancock, Wayne Shorter, Chick Corea and their contemporaries. Broadly examines modality in jazz and its similarities to music of Ravel and Debussy, as well as systems of organization in Messiaen and others. Strategies for analysis and integration of the material into a personal vocabulary as a composer and improviser are explored. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5103 (3) Teaching General Music

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental, and speech-based arrangements. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5106 (2) Guitar Literature

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4106

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5112 (3) Proseminar in Ethnomusicology

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5121 (3) Advanced Topics in Music Technology

Conducts advanced research in techniques and tools of music technology. Topics vary from term to term and may include: user interfaces for computer music; advanced sound design; digital modeling of acoustic sounds; computer-aided analysis of sound; modeling music intelligence in real time. Lectures and work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 5081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5136 (2) Advanced Conducting

Offers advanced work in conducting.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5138 (2) Advanced Choral Conducting

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5142 (3) American Indian Music

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4142

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5143 (2) Developing Children's Choirs

Examines the musical skills, teaching techniques and administrative procedures necessary for developing a children's choir. Offered fall term of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4143

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5151 (3) Topics in Music Analysis

Analytical study of a specific topic to be determined by the instructor (e.g., German Lieder, Bartok quartets, tonal rhythm, Schenker, etc). Study published analyses representing a variety of methodologies and produce original analyses. Student must have passed graduate preliminary exams or completed remediation before enrolling in this course.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5061 or MUSC 5071 as appropriate to the topic, or instructor consent required.

Additional Information: Departmental Category: Theory and Composition

MUSC 5156 (2) Symposium in Choral Music

Provides an advanced study of choral repertoire by style period. Required of all choral graduate students for a minimum of two semesters.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5168 (3) World Music Theories

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4168

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5183 (2) Research in Music Teaching

Introduces basic descriptive, experimental, and qualitative research methods, including sampling, design, data collection, and analysis. Students review published music research and conduct one original research study. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5203 (2) Topics in Music Education

Provides an in-depth examination of contemporary topics in music education. Students implement and design relevant projects.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5215 (1-2) Studies in Piano Teaching

Studies the practical aspects and techniques for teaching piano at the intermediate and advanced levels in pre-college and college settings, as well as teaching group piano at the college level.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisites: MUSC 5305 and MUSC 5315.

Additional Information: Departmental Category: Keyboard

MUSC 5246 (3) Jazz Improvisation and Analysis

Application of performance skills for the advanced improviser through specific harmonic, melodic and rhythmic techniques. Includes analysis of transcriptions and varied harmonic contexts as well as a focus on the development of repertoire. Offered fall semester of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 3071 (minimum grade D-). Restricted to Music (MUSC) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5255 (2) Service Playing Techniques

Study of church music for liturgical and non-liturgical denominations; includes hymn playing, anthem accompaniments, basics of conducting from the organ console and improvisation and selection of organ music appropriate to the requirements of the church year and other special services.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4255

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5256 (3) Jazz Studies Administration and Pedagogy

Surveys approaches, techniques, philosophies and materials available for teaching jazz at both pre-college and collegiate level. Subject areas covered include improvisation, composition and arranging, studio teaching and directing ensembles. Studies the organization and administration of collegiate jazz programs. Topics include curriculum, program philosophy, teaching techniques, funding, teacher training and evaluation. Offered fall terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 3253.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5273 (2) Comprehensive String Pedagogy

Comparative study and application of the principles of string teaching. In-depth analysis of individual instrument pedagogy and application to advanced studio and class teaching. Historical survey of major violin, viola, cello, and double bass pedagogues. Includes apprenticeship teaching. Offered fall of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5285 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4285

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5295 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4295

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5305 (2) Piano Pedagogy Group Techniques

Discusses materials and techniques for teaching beginning piano students of various ages in studio and class settings. Special attention given to adult classes. Includes an introduction to educational technology used in group instruction. Offered fall of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5313 (3) Teaching Choral Music

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4313

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5315 (2) Piano Pedagogy: Intermediate Literature

Surveys repertoire at the intermediate level and discusses teaching techniques. Explores issues related to intermediate and advanced piano performance, such as performance anxiety, physical and psychological well-being of the performer, and the development of technique. Introduces educational technology relevant to intermediate teaching. Offered spring of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5325 (2) Keyboard Literature 1

Examines areas of style, genre, and performance practice in selected keyboard music from 1600 to 1830. Emphasizes student presentation of specific topic areas. Offered fall terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5335 (2) Keyboard Literature 2

Examines areas of style, genre, and performance practice in selected areas of keyboard music from 1830 to the present. Emphasizes student presentation of specific topic areas. Offered spring terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5336 (2) Brass Pedagogy

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5345 (2) Research: Piano Literature and Pedagogy

Looks at individual or group research related to piano pedagogy or literature for piano.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5346 (3) Woodwind Pedagogy

Provides the knowledge and skills to teach woodwind instruments in both individual studio and collegiate class settings. Considers pedagogical techniques for all levels of instruction. Offered fall terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5356 (2) Jazz Studies Practicum

Implements independent, project-based studies for further developing knowledge and experience in jazz pedagogy, performance and composition. Student is assessed and guided by faculty to develop specific skills needed toward becoming a more effective jazz educator. Offered spring of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5256.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5365 (2) Advanced Accompanying

An in-depth study of collaborative repertoire in individually assigned projects, coached by collaborative piano faculty and others.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5375 (2) Opera Coaching for Pianists

Teaches skills for opera coaches and rehearsal pianists.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5405 (2) Basso-Continuo Accompaniment

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4405

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5425 (2) Collaborative Literature for Piano with Winds, Brass, and Percussion

Study of all forms of wind, brass and percussion repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered fall terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5435 (2) Collaborative Literature for Piano with Strings

Study of all forms string repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered spring terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5443 (3) Teaching Instrumental Music

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4443

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5444 (2) Vocal Pedagogy

In depth study of the physiology, acoustics, and health aspects of the singing voice. Recommended for all graduate students in voice.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5454 (2) Repertory for Young Voices

Survey of the solo repertoire for young voices, the physiological aspects of mutational voices, techniques of vocalizing young voices, and class voice procedure.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5464 (2) French Song Literature

Provides an extensive analytical and historical discussion of French song literature styles, from the 12th century to the present.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5484 (2) Graduate Seminar in Vocal Pedagogy

A thorough investigation of the challenges of studio voice pedagogy, including corrective techniques, psychological philosophies, and video analysis of student teaching. Examination and evaluation of comparative methodologies of vocal technique.

Requisites: Requires prerequisite course of MUSC 5444 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5564 (2) German Song Literature

Provides an extensive analytical and historical discussion of German song literature styles, from the 18th century to the present. Offered fall terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5583 (2) Inclusive Music Classroom

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4583

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5608 (1) Graduate Studies in the Alexander Technique

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities. Analysis and research regarding Alexander's principles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2608

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5642 (3) Jazz History and Literature

Studies musical trends and cultural forces influencing jazz, with analysis of improvisational styles, melodic and motivic variations, transcriptions and orchestrations from significant periods in its history. Offered spring terms only.

Requisites: Requires prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5666 (2) Chamber Music Literature: Woodwinds

Provides a stylistic-historical survey in various genres from Baroque era to present. Offered fall terms of even numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5708 (2) Introduction to Music Bibliography and Research

Explores basic informational sources about music and musicians; a study of citation formats, research methodologies and writing techniques employed in music research papers, theses and dissertations. Intended to increase students' information fluency. Required in all master's degree programs.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5712 (3) Renaissance Music

Provides a repertory and analysis of polyphonic music, 1400-1600.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4712

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5722 (1) Sight-Reading Medieval and Renaissance Music Literature

Provides an opportunity to read through, sing, play, study and discuss ancient repertories more intensively than is normally possible in music history lecture classes, seminars or chamber music ensembles. Evaluation is based on active participation, out-of-class research and final in-class group performance projects. Recommended for graduate students in historical musicology and choral conducting.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5742 (3) Performance Practice of Early Music

Examines instrumental and vocal performance practices through the 18th century. Topics may vary from year to year.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5752 (3) Women in Music

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4752

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5762 (3-4) History of Choral Literature

Provides a seminar in analysis of musical style and history of choral repertory. Those wishing review of literature and repertory may enroll for 4 credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5772 (3) History of Opera

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4772

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5802 (3) Studies in 20th Century Music

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4802

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5808 (1) Advanced Alexander Technique for Graduate Students

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 5608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4608

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 5608 (minimum grade C-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5822 (3) Ancient and Medieval Music

Surveys sources from the ancient Greeks to the early Christian era and music from the 8th to the 14th century.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5832 (3) Studies in American Music

Offers intensified work in folk, popular, and art music of the United States.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5842 (3) Aesthetics of Music

Surveys various philosophies of music in writings of philosophers, psychologists, sociologists, composers, critics and historians.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5852 (3) 17th and Early 18th Century Music

Examines music and writings about music from the Baroque era. Emphasizes cultural and musical analysis and surveys current musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4852

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5872 (3) Late 18th and 19th Century Music

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4872

Repeatable: Repeatable for up to 12.00 total credit hours.

Recommended: Prerequisite or corequisite MUSC 3812.

Additional Information: Departmental Category: Musicology

MUSC 5882 (3) Studies in 18th and 19th Century Music

Meets as a seminar and examines selected topics in Classic and Romantic music, 1750-1900. Topics vary from year to year.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5892 (3) Latin American Music

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4892

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5908 (1-3) Internship in Music Business

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4908

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5918 (2) Building Your Music Career

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2918

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5938 (3) Management and Leadership in the Arts

Presents leadership theories and management principles and their application to arts organizations. Examines concepts and approaches for leaders of small, medium and large arts organizations in both the for-profit and nonprofit sectors, including human resource management and effective communication.

Grading Basis: Letter Grade

MUSC 5948 (3) Sustainable Arts Organizations: Forecasting and Fundraising

Equips students to create comprehensive fundraising plans rooted in strategic business planning for arts organizations, which depend on contributed income for sustainability. Students will learn the basics of planning, budgeting and forecasting, along with proven, effective fundraising strategies and techniques. Includes case studies and guest speakers with extensive professional expertise in the field.

Grading Basis: Letter Grade

MUSC 5958 (2) Community Performances

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4958

Requisites: Requires prerequisite course of MUSC 5918 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5968 (2) Entrepreneurial Ventures in the Arts

Prepares students to evaluate opportunities in their specific arts field by analyzing existing arts organizations and then applying entrepreneurial concepts to create new enterprises. Topics for research and discussion include current issues in the arts, introduction to entrepreneurship, preparing a business feasibility study, market information for new ventures and funding sources.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5978 (3) Arts Administration & Management

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4978

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5988 (3) The Entrepreneurial Artist

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4988

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5918.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 6041 (3) Orchestration since 1940

Studies significant and distinctive orchestration techniques of the 20th century and 21st centuries. Offered spring of even-numbered years.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6051 (3) Pedagogy of Music Theory

Explores methods, materials, practical techniques for teaching undergraduate music theory, aural skills and analysis. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course. Offered spring of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6113 (2) Foundations of Music Education

Surveys historical and philosophical bases of contemporary music education. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6133 (2) Comprehensive Musicianship through Performance

Explores curricular models for music education. Emphasizes comprehensive musicianship and standards-based frameworks for curriculum and development. Offered spring terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6193 (1-3) Selected Studies in Music Education

Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Music (MUSD) or Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 6203 (2) Psychology of Music Learning

Provides an overview of psychological concepts relevant to music teaching and learning. Topics include learning theories, selected individual difference variables (motivation, anxiety, creativity, and personality), physiological structures related to hearing, psychoacoustics, and approaches to examining musical ability (e.g. brain research, music aptitude, and skill acquisition). Offered spring terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6213 (2) Assessment of Music Learning

Provides an overview of traditional and contemporary approaches to music assessment. Topics include psychometrics, standardized tests, test construction, grade reports, and student portfolios. Offered on a rotating basis during summer session.

Requisites: Restricted to Music Education (MMED-MMUE) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6223 (2) Sociology of Music Education

Studies sociological perspectives related to music education. Topics include functions and uses of music; teacher and student role/identity development; social aspects of music performance, and cultural perspectives on music learning. Offered fall of even-numbered years.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Recommended: Prerequisite MUSC 6113.

Additional Information: Departmental Category: Music Education

MUSC 6233 (2) Pedagogy of Music Teaching and Learning

Explores four topics (reflective/critical thinking, teacher effectiveness, cultural/program contexts, teachers' lives/career development) relevant to long-term teacher development. Includes individualized feedback on teaching. Open to graduate students in music education and performance-pedagogy. Offered spring terms of odd numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 6113 and/or significant teaching experience.

Additional Information: Departmental Category: Music Education

MUSC 6243 (1) Applications of Music Pedagogy

Provides a structured, collaborative environment for graduate students with K-12 teaching duties to apply the content from music education courses to their current pedagogical environments. Students will apply inquiry strategies as they design and implement an applied project that synthesizes specific theoretical or conceptual areas. Offered fall term only.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to Music Education (MMED-MMUE) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Music Education

MUSC 6325 (2) Seminar in Piano Literature

Provides an intensive study of a selected area of repertoire or history. Offered fall terms only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 6801 (3) Advanced Topics in Music Theory

Intensive study of a specialized topics in theory and analysis through critical reading and analysis, class presentations and independent research. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6822 (3) Advanced Studies in Musicology

Intensive study of a specialized topic in musicology. Students will be guided in critical reading, historical or ethnographic issues, analysis, oral presentations, and independent research.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 6948 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Theses and Recitals

MUSC 7046 (3) Seminar in Jazz Literature

Provides advanced study in jazz literature and styles. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires class presentations and a major paper or project. Offered spring semester only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Recommended: Prerequisites MUSC 5091 and MUSC 5642.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 7103 (3) Historical Research in Music Education

Topics include oral history, archival collections, data verification, and critiquing/publishing research. Students conduct one original research study. Offered spring of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) doctoral students only.

Additional Information: Departmental Category: Music Education

MUSC 7113 (3) Quantitative Research in Music Education

Topics include sampling, questionnaire development, research design, intermediate and advanced statistics, presenting/publishing research, and research ethics. Students conduct an original research study. Offered fall of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7138 (3) Contemporary Issues in College Teaching

Examines music teaching within colleges and universities, including the evolution of university music programs, undergraduate and graduate music curricula, music professors and their work, and sociopolitical issues. Offered spring of odd-numbered terms.

Requisites: Restricted to College of Music (MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 7143 (3) Qualitative Research in Music Education

Topics include qualitative research traditions, site and participant selection, data collection and analysis methods, quality standards, and research ethics. Students conduct an original research study. Offered fall of odd-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7203 (3) Doctoral Seminar in Music Education

Provides an advanced study of topics central to the music education profession. Requires class presentations and a major paper or project. Offered fall of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7801 (3) Doctoral Seminar in Music Theory

Provides advanced study in theory. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires a major paper or project. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

Requisites: Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to College of Music (MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 7822 (3) Seminar in Musicology

Required of all musicology majors before completion of comprehensive examinations. A different research area is designated each semester. See also MUSC 7832. Offered fall only.

Requisites: Restricted to Music (MUSD) graduate students only.

Additional Information: Departmental Category: Musicology

Music - Master of Music (MMus)

The major fields for this degree are composition, conducting, music theory, performance and the combined major of performance/pedagogy. Conducting students may concentrate in choral, orchestral or wind symphony/band. Performance and performance/pedagogy majors may

concentrate in brass instruments, early keyboard, jazz, piano, percussion, organ, harpsichord, string instruments (including harp and guitar), voice or woodwind instruments.

Major work in the conducting degrees includes advanced conducting, analytical studies, score reading, orchestration, arranging, conducting practica and research and writing. In music theory, course work and two thesis papers are required. In pedagogy, courses in the psychology of music learning, the pedagogy and literature of one's performing area and a written thesis are required. In performance, students complete applied study, recitals and courses that investigate the repertoire of their performance areas. All master's degree students are required to take a course in bibliographic research and 6 credits outside their major area.

Brass, conducting, percussion, string, voice and woodwind majors are required to participate in a music ensemble. Committee chairs advise students concerning the appropriate choice of ensemble.

Dual Degree Program

Master's Degree in Two College of Music Programs

Students may apply for a dual master's degree that combines any two master's programs in the College of Music. The student must apply separately and be admitted by the faculty in each of the degree programs under their respective admissions procedures and standards. The student must be accepted to both degree programs at the time of the initial application. With the exception of thesis credit hours, courses that fulfill requirements in both degree programs need only be taken once to be counted for both. A minimum of 45 credit hours must be earned. For most students, it is far preferable to pursue the DMA or PhD degree after completing a master's degree, rather than to pursue a dual master's degree.

Requirements

Prerequisites

Students should have completed undergraduate preparation equivalent to that expected for the bachelor's degree at this university. Normally this is a bachelor of music degree in the proposed area of concentration.

Before admission, composition majors should submit representative scores and recordings (CD format), and a list of completed compositions. Theory majors should submit two scholarly writing samples that demonstrate ability in critical analysis, appropriate research techniques and skill in the cogent use of English. For further details, see the Application Process section of the website. Performance majors must submit a repertoire list and arrange for an audition, or submit a non-returnable recording of their performance. Conducting majors must submit a videotape or DVD of their performance.

Program Requirements

The master of music (MM) degree, which the Graduate School considers a Plan II program, requires a minimum of 30–32 credit hours of graduate course work, including thesis projects. Many students find it necessary to exceed this minimum in order to meet the musical and academic standards demanded by the MM qualifying examination. Outlines of specific programs may be obtained online at www.colorado.edu/music/academics/graduate-advising/degrees.

Each student's program is directed by a three-member advisory committee headed by the major advisor (the student's major professor). A second member is chosen from the major area, and a third from outside the major area. (The major areas are music education, music theory,

composition and performance.) By the second semester of residence, the student should complete a tentative degree plan and obtain the approval of the advisory committee and the associate dean for graduate studies. Students must complete the master's degree within four years of matriculation into the program.

Examinations

In addition to preliminary examinations, master's degree students in music must take the master's qualifying examination. The procedures, guidelines for registration and deadlines for taking these examinations are announced by the Music Graduate Office.

Recital/Thesis Requirements

The recital/thesis requirement for the MM in composition is the composition (during the period of graduate study) of several works of major proportion, at least one of which must receive public performance. For the major in conducting, the requirement is a public practicum and a performance-related or other scholarly document. For the major in music theory, it is two thesis papers. For the major in performance, presentation of two public recitals constitute the requirement. For the major in performance and pedagogy, a full-length recital and a research document in pedagogy are required.

Music - Doctor of Philosophy (PhD)

The doctor of philosophy (PhD) in music degree is offered through the Graduate School for students who seek a terminal degree with an emphasis on research.

Areas of Emphasis

The two principal areas of study are music education and musicology (including ethnomusicology).

Music Education Emphasis

The Doctor of Philosophy degree in music, with music education as a field of specialization, is offered through the Graduate School for students who demonstrate both scholarly potential and a superior commitment to the music education profession.

This degree program requires that individuals think abstractly, generalize knowledge, apply research results to areas of specialization, and communicate effectively in both oral and written forms.

Course work emphasizes the study of historical, philosophical, psychological and sociological foundations of music education; the theoretical and pedagogical principles of music teaching and learning; curriculum development; testing and assessment; and research techniques.

Graduates typically pursue careers in music education at the college level or supervisory positions in elementary and secondary schools.

Musicology Emphasis

For the musicology student, the Doctor of Philosophy in music degree is intended to emphasize research in music history, music theory, ethnomusicology or some other aspect of music in culture.

The musicology faculty encourage students entering the graduate program, whether from the bachelor's or master's level, to pursue the PhD, the benchmark of professional education within the field.

Requirements

Prerequisites

Students applying to the PhD program should have a bachelor's degree or equivalent in a music field related to their intended area of study. Applicants for the PhD with an emphasis in music education should hold an MME degree.

Letters of recommendation, representative research papers and satisfactory scores on the GRE (the general test) are required elements of the student's application for the degree.

Upon entrance to the degree program, students must pass the preliminary examinations and begin working toward basic requirements.

Degree Requirements

Music Education Emphasis Course Requirements

Students must complete a minimum of 45 credit hours of courses numbered 5000 or above, 15 of which may be transferred from the master's degree, and a minimum of 30 credit hours of doctoral dissertation credit.

Dissertation Requirements

Each candidate must complete a dissertation based on original investigation that demonstrates mature scholarship. Following successful completion of the comprehensive examination, the student designates a dissertation committee, develops a dissertation prospectus and presents it to the committee for approval. After the dissertation has been accepted, a final oral examination on the dissertation and related topics is conducted by the student's dissertation committee.

Musicology Emphasis Course Requirements

Students must complete a minimum of 30 credit hours of courses numbered 5000 or above, although the minimum number is almost always exceeded. At least four doctoral seminars (7000 level) in musicology and music theory (3 plus 1, 1 plus 3, or 2 plus 2) must be taken at CU Boulder as part of this course work.

Students must also complete at least 30 credit hours of dissertation credit, with not more than 10 of those credit hours in any one semester. Furthermore, not more than 10 credit hours of dissertation credit earned prior to a student's advancement to candidacy may be applied toward the required 30 credit hours.

Up to 21 credit hours of graduate work taken at another institution may be considered for transfer.

The College of Music requires proficiency in two foreign languages appropriate to the student's program of study. Normally, the language requirement is met by a translation examination scheduled twice a semester through the graduate music office.

Dissertation Requirements

The dissertation should be an original and worthwhile contribution to knowledge in the field of musicology. It is expected that the student work closely with a major professor who will serve as the first reader and critic before the dissertation is submitted to the other dissertation committee members.

Opera and Solo Vocal Performance - Graduate Certificate

This program provides instruction and experiences for a select number of young artists, most of whom have already completed a master's degree in performance. Participants in the certificate program will concentrate significantly on the performance aspect of their work. This program is considered a path to a specialized career in solo vocal performance.

Required Courses and Semester Credit Hours

Requirements in Major Area

PMUS 6726	Voice (four semesters required; 2 credits each) ¹	8
TMUS 6956	Master's Thesis (two major opera roles)	4
TMUS 6957	Master's Thesis 2 (recital)	2
TMUS 6957	Master's Thesis 2 (major role in an oratorio or opera, a major work with orchestra, or a second recital)	2

Other Requirements in Music

Entrepreneurship. Select from the following: ²		2
MUSC 5918	Building Your Music Career	
MUSC 5908	Internship in Music Business	
MUSC 5958	Community Performances	

Electives

Additional coursework shall be taken in vocal literature, voice pedagogy, entrepreneurship, or musicology/music theory at the 4000- or 5000-level. ³		2
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Total Credit Hours 20

- One-hour weekly lesson, plus one-hour weekly performance class.
- A maximum of two credits at the 4000-level may be taken in fulfillment of the certificate requirements.
- Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary exams.

String Quartet Performance - Graduate Certificate

The Professional Certificate in String Quartet Performance is designed to provide instruction and experiences for young artists who have already completed a master's degree or its equivalent in performance. Students are generally accepted into the certificate program as part of a preformed string quartet, which will apply for admission into the College of Music graduate program as a unit.

Required Courses and Semester Credit Hours

Requirements in Major Area

PMUS 6696	Viola (two semesters for one year) ¹	4
	or PMUS 6706 Violin	
	or PMUS 6716 Violoncello	
TMUS 6956	Master's Thesis (chamber music recitals; two semesters) ²	4

TMUS 6957	Master's Thesis 2 (chamber music recitals; two semesters) ²	4
EMUS 5327	Symphony Orchestra (two semesters) ³	1

Other Requirements in Music

Entrepreneurship. Select from the following: ⁴		2
MUSC 5918	Building Your Music Career	
MUSC 5988	The Entrepreneurial Artist	
MUSC 5978	Arts Administration & Management	

Electives

Additional credits in the College of Music at the 4000- or 5000-level. ⁵		4
Total Credit Hours		19

- Applied string instruction. Registration for applied study is for two credit hours per semester, entitling each member of the quartet to one hour of private lessons per week.
- This four-recital requirement entitles the quartet to one hour of coaching per week. The string faculty will decide if one of these recitals should be a solo recital.
- Two fall semesters as principals in the Chamber Orchestra (1 credit each).
- A maximum of two credits at the 4000-level may be taken in fulfillment of the certificate requirements.
- Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary examinations.

Woodwind Performance - Graduate Certificate

This program is designed to emphasize performance experiences for truly outstanding young artists who have already completed a master's degree or its equivalent in woodwind performance. The professional certificate is intended for students who plan on careers in performance and admission and is highly selective.

Required Courses and Semester Credit Hours

Requirements in Major Area

PMUS 6506	Bassoon (four semesters required) ¹	8
	or PMUS 6516 Clarinet	
	or PMUS 6556 Flute	
	or PMUS 6596 Horn	
	or PMUS 6606 Oboe	
TMUS 6956	Master's Thesis (one solo recital) ²	2
TMUS 6957	Master's Thesis 2 (one chamber music recital) ³	2
TMUS 6956	Master's Thesis (one chamber music or solo recital)	2
	or TMUS 6957 Master's Thesis 2	
TMUS 6957	Master's Thesis 2 (orchestral repertoire [excerpts]; one public performance and lecture)	2
EMUS 5327	Symphony Orchestra (four semesters) ⁴	4

Other Requirements in Music

Entrepreneurship. Select from the following: ⁵		2
MUSC 5918	Building Your Music Career	
MUSC 5908	Internship in Music Business	

MUSC 5958	Community Performances
Electives	
Additional coursework in woodwind literature, woodwind pedagogy, entrepreneurship, or musicology/music theory at the 4000- or 5000-level. ⁶	2
Total Credit Hours	24

¹ Applied woodwind instruction. One-hour weekly lesson, plus one-hour weekly performance class.

² Two concerto performances may be substituted for one solo recital.

³ Must include woodwind quintet and other mixed ensembles.

⁴ Orchestra (symphony, chamber, or opera) or Wind Symphony.

⁵ A maximum of two credits at the 4000-level may be taken in fulfillment of the certificate requirements.

⁶ Students who wish to take academic classes at the 5000-level or above will be required to pass the appropriate preliminary examinations.

Music Education

Students in this degree program complete advanced studies that are designed to refine their teaching philosophy and practices. These studies include courses in historical and philosophical foundations of music education, psychological theories of music learning, basic research methods, curriculum development, and assessment. The minimum number of credit hours required is 30.

The college also offers a master of music education degree/certification with K–12 teaching for students who have completed an undergraduate degree in music, but in a major area other than music education. Course work leads to a master's degree and a Colorado K–12 music teaching license. The entire program requires a minimum of 71 credit hours.

Master's Degree

- Music Education - Master of Music Education (MMusEd) (p. 1333)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Austin, James R (https://experts.colorado.edu/display/fisid_103455)
Professor; PhD, University of Iowa

Berg, Margaret H (https://experts.colorado.edu/display/fisid_118371)
Associate Professor; PhD, Northwestern University

Dockendorf, Matthew Paul (https://experts.colorado.edu/display/fisid_154511)
Instructor; MM, Ohio State University

Heil, Leila Theresa (https://experts.colorado.edu/display/fisid_149780)
Assistant Professor; PhD, University of Colorado Boulder

Miranda, Martina L (https://experts.colorado.edu/display/fisid_140091)
Associate Professor; DMA, Arizona State University

Rickels, David Aaron (https://experts.colorado.edu/display/fisid_151424)
Assistant Professor; DMA, Arizona State University

Roeder, Matthew J (https://experts.colorado.edu/display/fisid_120180)
Associate Professor; DMA, University of Colorado Boulder

Courses

MUSC 5002 (3) Proseminar in Historical Musicology

Prepares students to pursue independent research in the history of music. Meeting as a seminar, the course focuses on the nature of evidence, methods and tools of research, and theoretical or historiographic issues.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4011

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4012 and MUEL 4012

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the styles. Offered fall terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5026 (2) Percussion Literature

In-depth investigation of major original solo works for percussion, significant ensemble literature including chamber and large ensembles, and selected transcriptions. Instructor consent required.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5036 (2) Brass Literature

Investigates major original solo works for trumpet, horn, trombone, euphonium, and tuba, and ensemble literature including chamber and large settings. Offered every other spring term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5041 (2) Advanced Orchestration

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5061 (3) Advanced Tonal Analysis

Surveys tonal repertory and analytical techniques. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5071 (3) Post-tonal Theory and Analysis I

Focuses on theory and analysis of post-tonal literature pre-1945. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4078

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite piano majors.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5081 (3) Applications in Music Technology

Presents advanced strategies for applying computer technology in music creation. Synthesis, DSP, MIDI and audio sequencing, as well as advanced music engraving, will be explored through the use of various software platforms including Logic, Reason, MAX and Finale. Offered fall term only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5091 (3) Contemporary Theory - Jazz and Modal Music

Studies the composition and improvisation of Herbie Hancock, Wayne Shorter, Chick Corea and their contemporaries. Broadly examines modality in jazz and its similarities to music of Ravel and Debussy, as well as systems of organization in Messiaen and others. Strategies for analysis and integration of the material into a personal vocabulary as a composer and improviser are explored. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5103 (3) Teaching General Music

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental, and speech-based arrangements. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5106 (2) Guitar Literature

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4106

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5112 (3) Proseminar in Ethnomusicology

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5121 (3) Advanced Topics in Music Technology

Conducts advanced research in techniques and tools of music technology. Topics vary from term to term and may include: user interfaces for computer music; advanced sound design; digital modeling of acoustic sounds; computer-aided analysis of sound; modeling music intelligence in real time. Lectures and work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 5081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5136 (2) Advanced Conducting

Offers advanced work in conducting.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5138 (2) Advanced Choral Conducting

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5142 (3) American Indian Music

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4142

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5143 (2) Developing Children's Choirs

Examines the musical skills, teaching techniques and administrative procedures necessary for developing a children's choir. Offered fall term of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4143

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5151 (3) Topics in Music Analysis

Analytical study of a specific topic to be determined by the instructor (e.g., German Lieder, Bartok quartets, tonal rhythm, Schenker, etc). Study published analyses representing a variety of methodologies and produce original analyses. Student must have passed graduate preliminary exams or completed remediation before enrolling in this course.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5061 or MUSC 5071 as appropriate to the topic, or instructor consent required.

Additional Information: Departmental Category: Theory and Composition

MUSC 5156 (2) Symposium in Choral Music

Provides an advanced study of choral repertoire by style period. Required of all choral graduate students for a minimum of two semesters.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5168 (3) World Music Theories

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4168

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5183 (2) Research in Music Teaching

Introduces basic descriptive, experimental, and qualitative research methods, including sampling, design, data collection, and analysis. Students review published music research and conduct one original research study. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5203 (2) Topics in Music Education

Provides an in-depth examination of contemporary topics in music education. Students implement and design relevant projects.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5215 (1-2) Studies in Piano Teaching

Studies the practical aspects and techniques for teaching piano at the intermediate and advanced levels in pre-college and college settings, as well as teaching group piano at the college level.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisites: MUSC 5305 and MUSC 5315.

Additional Information: Departmental Category: Keyboard

MUSC 5246 (3) Jazz Improvisation and Analysis

Application of performance skills for the advanced improviser through specific harmonic, melodic and rhythmic techniques. Includes analysis of transcriptions and varied harmonic contexts as well as a focus on the development of repertoire. Offered fall semester of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 3071 (minimum grade D-). Restricted to Music (MUSC) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5255 (2) Service Playing Techniques

Study of church music for liturgical and non-liturgical denominations; includes hymn playing, anthem accompaniments, basics of conducting from the organ console and improvisation and selection of organ music appropriate to the requirements of the church year and other special services.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4255

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5256 (3) Jazz Studies Administration and Pedagogy

Surveys approaches, techniques, philosophies and materials available for teaching jazz at both pre-college and collegiate level. Subject areas covered include improvisation, composition and arranging, studio teaching and directing ensembles. Studies the organization and administration of collegiate jazz programs. Topics include curriculum, program philosophy, teaching techniques, funding, teacher training and evaluation. Offered fall terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 3253.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5273 (2) Comprehensive String Pedagogy

Comparative study and application of the principles of string teaching. In-depth analysis of individual instrument pedagogy and application to advanced studio and class teaching. Historical survey of major violin, viola, cello, and double bass pedagogues. Includes apprenticeship teaching. Offered fall of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5285 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4285

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5295 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4295

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5305 (2) Piano Pedagogy Group Techniques

Discusses materials and techniques for teaching beginning piano students of various ages in studio and class settings. Special attention given to adult classes. Includes an introduction to educational technology used in group instruction. Offered fall of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5313 (3) Teaching Choral Music

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4313

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5315 (2) Piano Pedagogy: Intermediate Literature

Surveys repertoire at the intermediate level and discusses teaching techniques. Explores issues related to intermediate and advanced piano performance, such as performance anxiety, physical and psychological well-being of the performer, and the development of technique. Introduces educational technology relevant to intermediate teaching. Offered spring of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5325 (2) Keyboard Literature 1

Examines areas of style, genre, and performance practice in selected keyboard music from 1600 to 1830. Emphasizes student presentation of specific topic areas. Offered fall terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5335 (2) Keyboard Literature 2

Examines areas of style, genre, and performance practice in selected areas of keyboard music from 1830 to the present. Emphasizes student presentation of specific topic areas. Offered spring terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5336 (2) Brass Pedagogy

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5345 (2) Research: Piano Literature and Pedagogy

Looks at individual or group research related to piano pedagogy or literature for piano.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5346 (3) Woodwind Pedagogy

Provides the knowledge and skills to teach woodwind instruments in both individual studio and collegiate class settings. Considers pedagogical techniques for all levels of instruction. Offered fall terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5356 (2) Jazz Studies Practicum

Implements independent, project-based studies for further developing knowledge and experience in jazz pedagogy, performance and composition. Student is assessed and guided by faculty to develop specific skills needed toward becoming a more effective jazz educator. Offered spring of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5256.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5365 (2) Advanced Accompanying

An in-depth study of collaborative repertoire in individually assigned projects, coached by collaborative piano faculty and others.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5375 (2) Opera Coaching for Pianists

Teaches skills for opera coaches and rehearsal pianists.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5405 (2) Basso-Continuo Accompaniment

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4405

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5425 (2) Collaborative Literature for Piano with Winds, Brass, and Percussion

Study of all forms of wind, brass and percussion repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered fall terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5435 (2) Collaborative Literature for Piano with Strings

Study of all forms string repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered spring terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5443 (3) Teaching Instrumental Music

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4443

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5444 (2) Vocal Pedagogy

In depth study of the physiology, acoustics, and health aspects of the singing voice. Recommended for all graduate students in voice.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5454 (2) Repertory for Young Voices

Survey of the solo repertoire for young voices, the physiological aspects of mutational voices, techniques of vocalizing young voices, and class voice procedure.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5464 (2) French Song Literature

Provides an extensive analytical and historical discussion of French song literature styles, from the 12th century to the present.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5484 (2) Graduate Seminar in Vocal Pedagogy

A thorough investigation of the challenges of studio voice pedagogy, including corrective techniques, psychological philosophies, and video analysis of student teaching. Examination and evaluation of comparative methodologies of vocal technique.

Requisites: Requires prerequisite course of MUSC 5444 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5564 (2) German Song Literature

Provides an extensive analytical and historical discussion of German song literature styles, from the 18th century to the present. Offered fall terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5583 (2) Inclusive Music Classroom

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4583

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5608 (1) Graduate Studies in the Alexander Technique

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities. Analysis and research regarding Alexander's principles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2608

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5642 (3) Jazz History and Literature

Studies musical trends and cultural forces influencing jazz, with analysis of improvisational styles, melodic and motivic variations, transcriptions and orchestrations from significant periods in its history. Offered spring terms only.

Requisites: Requires prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5666 (2) Chamber Music Literature: Woodwinds

Provides a stylistic-historical survey in various genres from Baroque era to present. Offered fall terms of even numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5708 (2) Introduction to Music Bibliography and Research

Explores basic informational sources about music and musicians; a study of citation formats, research methodologies and writing techniques employed in music research papers, theses and dissertations. Intended to increase students' information fluency. Required in all master's degree programs.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5712 (3) Renaissance Music

Provides a repertory and analysis of polyphonic music, 1400-1600.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4712

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5722 (1) Sight-Reading Medieval and Renaissance Music Literature

Provides an opportunity to read through, sing, play, study and discuss ancient repertoires more intensively than is normally possible in music history lecture classes, seminars or chamber music ensembles. Evaluation is based on active participation, out-of-class research and final in-class group performance projects. Recommended for graduate students in historical musicology and choral conducting.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5742 (3) Performance Practice of Early Music

Examines instrumental and vocal performance practices through the 18th century. Topics may vary from year to year.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5752 (3) Women in Music

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4752

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5762 (3-4) History of Choral Literature

Provides a seminar in analysis of musical style and history of choral repertory. Those wishing review of literature and repertory may enroll for 4 credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5772 (3) History of Opera

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4772

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5802 (3) Studies in 20th Century Music

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4802

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5808 (1) Advanced Alexander Technique for Graduate Students

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 5608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4608

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 5608 (minimum grade C-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5822 (3) Ancient and Medieval Music

Surveys sources from the ancient Greeks to the early Christian era and music from the 8th to the 14th century.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5832 (3) Studies in American Music

Offers intensified work in folk, popular, and art music of the United States.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5842 (3) Aesthetics of Music

Surveys various philosophies of music in writings of philosophers, psychologists, sociologists, composers, critics and historians.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5852 (3) 17th and Early 18th Century Music

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4852

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5872 (3) Late 18th and 19th Century Music

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4872

Repeatable: Repeatable for up to 12.00 total credit hours.

Recommended: Prerequisite or corequisite MUSC 3812.

Additional Information: Departmental Category: Musicology

MUSC 5882 (3) Studies in 18th and 19th Century Music

Meets as a seminar and examines selected topics in Classic and Romantic music, 1750-1900. Topics vary from year to year.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5892 (3) Latin American Music

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4892

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5908 (1-3) Internship in Music Business

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4908

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5918 (2) Building Your Music Career

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2918

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5938 (3) Management and Leadership in the Arts

Presents leadership theories and management principles and their application to arts organizations. Examines concepts and approaches for leaders of small, medium and large arts organizations in both the for-profit and nonprofit sectors, including human resource management and effective communication.

Grading Basis: Letter Grade

MUSC 5948 (3) Sustainable Arts Organizations: Forecasting and Fundraising

Equips students to create comprehensive fundraising plans rooted in strategic business planning for arts organizations, which depend on contributed income for sustainability. Students will learn the basics of planning, budgeting and forecasting, along with proven, effective fundraising strategies and techniques. Includes case studies and guest speakers with extensive professional expertise in the field.

Grading Basis: Letter Grade

MUSC 5958 (2) Community Performances

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4958

Requisites: Requires prerequisite course of MUSC 5918 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5968 (2) Entrepreneurial Ventures in the Arts

Prepares students to evaluate opportunities in their specific arts field by analyzing existing arts organizations and then applying entrepreneurial concepts to create new enterprises. Topics for research and discussion include current issues in the arts, introduction to entrepreneurship, preparing a business feasibility study, market information for new ventures and funding sources.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5978 (3) Arts Administration & Management

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4978

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5988 (3) The Entrepreneurial Artist

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4988

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5918.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 6041 (3) Orchestration since 1940

Studies significant and distinctive orchestration techniques of the 20th century and 21st centuries. Offered spring of even-numbered years.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6051 (3) Pedagogy of Music Theory

Explores methods, materials, practical techniques for teaching undergraduate music theory, aural skills and analysis. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course. Offered spring of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6113 (2) Foundations of Music Education

Surveys historical and philosophical bases of contemporary music education. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6133 (2) Comprehensive Musicianship through Performance

Explores curricular models for music education. Emphasizes comprehensive musicianship and standards-based frameworks for curriculum and development. Offered spring terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6193 (1-3) Selected Studies in Music Education

Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Music (MUSD) or Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 6203 (2) Psychology of Music Learning

Provides an overview of psychological concepts relevant to music teaching and learning. Topics include learning theories, selected individual difference variables (motivation, anxiety, creativity, and personality), physiological structures related to hearing, psychoacoustics, and approaches to examining musical ability (e.g. brain research, music aptitude, and skill acquisition). Offered spring terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6213 (2) Assessment of Music Learning

Provides an overview of traditional and contemporary approaches to music assessment. Topics include psychometrics, standardized tests, test construction, grade reports, and student portfolios. Offered on a rotating basis during summer session.

Requisites: Restricted to Music Education (MMED-MMUE) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6223 (2) Sociology of Music Education

Studies sociological perspectives related to music education. Topics include functions and uses of music; teacher and student role/identity development; social aspects of music performance, and cultural perspectives on music learning. Offered fall of even-numbered years.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Recommended: Prerequisite MUSC 6113.

Additional Information: Departmental Category: Music Education

MUSC 6233 (2) Pedagogy of Music Teaching and Learning

Explores four topics (reflective/critical thinking, teacher effectiveness, cultural/program contexts, teachers' lives/career development) relevant to long-term teacher development. Includes individualized feedback on teaching. Open to graduate students in music education and performance-pedagogy. Offered spring terms of odd numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 6113 and/or significant teaching experience.

Additional Information: Departmental Category: Music Education

MUSC 6243 (1) Applications of Music Pedagogy

Provides a structured, collaborative environment for graduate students with K-12 teaching duties to apply the content from music education courses to their current pedagogical environments. Students will apply inquiry strategies as they design and implement an applied project that synthesizes specific theoretical or conceptual areas. Offered fall term only.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to Music Education (MMED-MMUE) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Music Education

MUSC 6325 (2) Seminar in Piano Literature

Provides an intensive study of a selected area of repertoire or history. Offered fall terms only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 6801 (3) Advanced Topics in Music Theory

Intensive study of a specialized topics in theory and analysis through critical reading and analysis, class presentations and independent research. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6822 (3) Advanced Studies in Musicology

Intensive study of a specialized topic in musicology. Students will be guided in critical reading, historical or ethnographic issues, analysis, oral presentations, and independent research.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 6948 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Theses and Recitals

MUSC 7046 (3) Seminar in Jazz Literature

Provides advanced study in jazz literature and styles. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires class presentations and a major paper or project. Offered spring semester only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Recommended: Prerequisites MUSC 5091 and MUSC 5642.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 7103 (3) Historical Research in Music Education

Topics include oral history, archival collections, data verification, and critiquing/publishing research. Students conduct one original research study. Offered spring of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) doctoral students only.

Additional Information: Departmental Category: Music Education

MUSC 7113 (3) Quantitative Research in Music Education

Topics include sampling, questionnaire development, research design, intermediate and advanced statistics, presenting/publishing research, and research ethics. Students conduct an original research study. Offered fall of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7138 (3) Contemporary Issues in College Teaching

Examines music teaching within colleges and universities, including the evolution of university music programs, undergraduate and graduate music curricula, music professors and their work, and sociopolitical issues. Offered spring of odd-numbered terms.

Requisites: Restricted to College of Music (MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 7143 (3) Qualitative Research in Music Education

Topics include qualitative research traditions, site and participant selection, data collection and analysis methods, quality standards, and research ethics. Students conduct an original research study. Offered fall of odd-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7203 (3) Doctoral Seminar in Music Education

Provides an advanced study of topics central to the music education profession. Requires class presentations and a major paper or project. Offered fall of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7801 (3) Doctoral Seminar in Music Theory

Provides advanced study in theory. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires a major paper or project. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

Requisites: Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to College of Music (MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 7822 (3) Seminar in Musicology

Required of all musicology majors before completion of comprehensive examinations. A different research area is designated each semester. See also MUSC 7832. Offered fall only.

Requisites: Restricted to Music (MUSD) graduate students only.

Additional Information: Departmental Category: Musicology

NCMU 5093 (0.2-3) Special Topics in Music

Repeatable: Repeatable for up to 3.00 total credit hours.

Music Education - Master of Music Education (MMusEd)

The Master of Music Education program addresses the professional development needs of music teachers in the field. Students are challenged to develop a greater understanding and mastery of music teaching-learning processes, to improve personal musicianship, and to become committed leaders within the music education profession.

Dual Degree Program

Master's Degree in Two College of Music Programs

Students may apply for a dual master's degree that combines any two master's programs in the College of Music. The student must apply separately and be admitted by the faculty in each of the degree programs under their respective admissions procedures and standards. The student must be accepted to both degree programs at the time of the initial application. With the exception of thesis credit hours, courses that fulfill requirements in both degree programs need only be taken once to be counted for both. A minimum of 45 credit hours must be earned.

For most students, it is far preferable to pursue the DMA or PhD degree after completing a master's degree, rather than to pursue a dual master's degree.

Requirements

Prerequisites

Applicants are expected to provide evidence of undergraduate preparation equivalent to that required for the bachelor of music education degree at this university. Applicants also must possess a music teaching certificate/license or agree to work toward a Colorado music teaching license. GRE scores are not required for admission, but can be helpful in determining merit-based financial aid. Individuals who wish to pursue music performance or conducting as their cognate area

must demonstrate at least senior-level proficiency on their particular medium through an audition.

Program of Study

Students earning the MMusEd degree must complete a minimum of 30 credit hours of course work, including 12 credit hours in music education, 12 credit hours in music and 6 credit hours of electives in a specialization area or other areas of interest. Of the 12 credit hours in music, a 2-credit-hour course in bibliography and research is required, as well as 6 credit hours of study in a cognate area, which includes musicology, music theory or performance (including conducting and jazz studies).

The music component of the degree should assist students in developing their musical knowledge and skills. One member of the student's graduate advisory committee should be from the cognate area, and it is assumed that at least some part of the student's study is with that faculty member. All music studies must be at the 5000 level or above. Under special circumstances, up to 6 credit hours at the 4000-level may be applied to the open electives portion of the degree.

As an MMusEd degree candidate, each student must produce a culminating paper that focuses on a topic of vital interest or importance. This paper may be developed as part of the requirements for a music education course or may take the form of a master's thesis. Culminating papers or theses are defended during final oral examinations.

Students typically complete the degree in two academic years, or one academic year plus two summers. Degree work must be completed within four years of the semester in which the student is accepted into a degree program and begins studies. Because most master's level music education courses are offered in late afternoons, students who live within commuting distance can earn a significant portion of credit toward the degree while continuing to work full time.

Musical Arts

The faculty of the College of Music has modeled the DMA degree programs at CU Boulder after the guiding principles outlined by the National Association of Schools of Music. As defined by the NASM, the Doctor of Musical Arts degree is intended for those seeking "the highest level of professional practice emphasizing the creation or performance of musical works and the application and transmission of knowledge about musical works, or pedagogy... Creation, performance, and teaching are highly disciplined efforts; inquiry and investigation, and often research and scholarship, are components of performance practice" (*NASM Handbook*, 2009–10: 116).

Doctoral Degree

- Doctor of Musical Arts (DMA) (p. 1336)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaholm, Philip
Professor Emeritus

Austin, James R (https://experts.colorado.edu/display/fisid_103455)
Professor; PhD, University of Iowa

Bernstein, Giora
Professor Emeritus

Bird-Arvidsson, Jennifer (https://experts.colorado.edu/display/fisid_147651)
Associate Professor; MM, University of Michigan Ann Arbor

Brody, James M (https://experts.colorado.edu/display/fisid_101948)
Associate Professor; MM, Indiana University Bloomington

Bruns, Steven M (https://experts.colorado.edu/display/fisid_103483)
Associate Professor; PhD, University of Wisconsin-Madison

Caballero, Carlo (https://experts.colorado.edu/display/fisid_111681)
Associate Professor; PhD, University of Pennsylvania

Carthy, Nicholas R. (https://experts.colorado.edu/display/fisid_135356)
Associate Professor/Instructor; BA, Guildhall School of Music, London (England)

Chang, Philip C (https://experts.colorado.edu/display/fisid_143541)
Senior Instructor; MA, University of Rochester

Chellis, Matthew Wren (https://experts.colorado.edu/display/fisid_154415)
Assistant Professor; MM, Manhattan School of Music

Conlon, Joan Catoni
Professor Emeritus

Cooper, Peter W. (https://experts.colorado.edu/display/fisid_134522)
Senior Instructor

Cooperstock, Andrew B (https://experts.colorado.edu/display/fisid_115393)
Professor; DMA, Peabody Institute of Johns Hopkins University

Cremschi, Alejandro M. (https://experts.colorado.edu/display/fisid_134168)
Associate Professor; DMA, University of Minnesota Twin Cities

Davis, John S (https://experts.colorado.edu/display/fisid_115443)
Professor; DMA, University of Northern Colorado

Dockendorf, Matthew Paul (https://experts.colorado.edu/display/fisid_154511)
Instructor; MM, Ohio State University

Drumheller, John E (https://experts.colorado.edu/display/fisid_103707)
Senior Instructor; DMA, University of Colorado Boulder

Dunn, James M (https://experts.colorado.edu/display/fisid_140593)
Associate Professor; DMus, Arizona State University

Dusinberre, Edward (https://experts.colorado.edu/display/fisid_101358)
Assoc Professor Attendant Rank/Artist in Residence

Eakin, Charles
Professor Emeritus

Eckert, Erika L (https://experts.colorado.edu/display/fisid_101844)
Associate Professor; BM, University of Rochester

Eddy, Marjorie Alexandra (https://experts.colorado.edu/display/fisid_111634)
Lecturer

Ellsworth, Oliver
Professor Emeritus

Erhard, Paul M (https://experts.colorado.edu/display/fisid_100493)
Professor; DMA, The Juilliard School

Farr, Elizabeth G (https://experts.colorado.edu/display/fisid_101732)
Professor; DMA, University of Michigan Ann Arbor

Fejer, Andras (https://experts.colorado.edu/display/fisid_103923)
Artist in Residence

Fink, Robert
Professor Emeritus

Galm, John
Professor Emeritus

Gentry, Gregory R (https://experts.colorado.edu/display/fisid_151707)
Associate Professor; DMA, University of Missouri-Kansas City

Gonzalez, Luis
Professor Emeritus

Goode, Bradley M. (https://experts.colorado.edu/display/fisid_134686)
Associate Professor/Instructor; MM, DePaul University

Graham, Larry
Professor Emeritus

Gunther, John G (https://experts.colorado.edu/display/fisid_141165)
Associate Professor; PhD, New York University

Hata, Kuniaki
Professor Emeritus

Hayes, Deborah
Professor Emeritus

Hayghe, Jennifer C (https://experts.colorado.edu/display/fisid_155969)
Associate Professor; DMA, The Juilliard School

Holman-Johnson, Leigh (https://experts.colorado.edu/display/fisid_141980)
Associate Professor; DMA, University of Colorado Boulder

Ishikawa, Yoshiyuki (https://experts.colorado.edu/display/fisid_102125)
Professor; DMA, University of Michigan Ann Arbor

Jackson, Dennis
Professor Emeritus

Jennings, Christina A (https://experts.colorado.edu/display/fisid_143545)
Associate Professor; MM, The Juilliard School

Kearns, William
Professor Emeritus

Keister, Jay (https://experts.colorado.edu/display/fisid_115734)
Associate Professor; PhD, University of California-Los Angeles

Kellogg, Daniel Dixon (https://experts.colorado.edu/display/fisid_141124)
Associate Professor; DMA, Yale University

Kim, Suyeon (https://experts.colorado.edu/display/fisid_153470)
Lecturer/Instructor

Korevaar, David J (https://experts.colorado.edu/display/fisid_118374)
Professor; DMA, The Juilliard School

Lehnert, Doris Pridonoff
Professor Emeritus

Lehnert, Oswald
Professor Emeritus

Leong, Daphne (https://experts.colorado.edu/display/fisid_115747)
Associate Professor; PhD, University of Rochester

Lewis, Gary J (https://experts.colorado.edu/display/fisid_145854)
Professor/Instructor; MM, Texas Tech University

Lin, Hsiao-Ling (https://experts.colorado.edu/display/fisid_149958)
Instructor; MM, DePaul University

Malin, Jonathan (https://experts.colorado.edu/display/fisid_151714)
Associate Professor; PhD, University of Chicago

Maloy, Rebecca (https://experts.colorado.edu/display/fisid_125582)
Professor/Associate Professor; PhD, University of Cincinnati

Mason, Patrick C (https://experts.colorado.edu/display/fisid_101840)
Professor; MM, University of Nebraska-Lincoln

McCarthy, Kevin
Professor Emeritus

McDonald, Margaret M (https://experts.colorado.edu/display/fisid_134703)
Associate Professor; DMA, University of California-Santa Barbara

McKee, Paul (https://experts.colorado.edu/display/fisid_154465)
Associate Professor; MM, University of Texas at Austin

McKinney, Donald J (https://experts.colorado.edu/display/fisid_152974)
Associate Professor; DMA, University of Michigan Ann Arbor

Moteki, Mutsumi (https://experts.colorado.edu/display/fisid_100992)
Professor; DMA, University of Michigan Ann Arbor

Myer, Tom R (https://experts.colorado.edu/display/fisid_100922)
Associate Professor; MM, East Texas State University

Nguyen, Alexandra (https://experts.colorado.edu/display/fisid_145847)
Associate Professor; DMA, University of Rochester

Nims, Abigail Andrews (https://experts.colorado.edu/display/fisid_152977)
Assistant Professor; MM, Westminster Choir College

Nytch, Jeffrey C. (https://experts.colorado.edu/display/fisid_147341)
Associate Professor; DMA, Rice University

Okigbo, Austin Chinagorom (https://experts.colorado.edu/display/fisid_151507)
Assistant Professor; PhD, Indiana University Bloomington

Pann, Carter N (https://experts.colorado.edu/display/fisid_141461)
Associate Professor; DMA, University of Michigan Ann Arbor

Peterson, Patti H (https://experts.colorado.edu/display/fisid_101502)
Associate Professor; DMA, University of Colorado Boulder

Pinkow, David
Professor Emeritus

Ramsey, Andrea L (https://experts.colorado.edu/display/fisid_154420)
Assistant Professor; PhD, Michigan State University

Reger, Jeremy J (https://experts.colorado.edu/display/fisid_156224)
Instructor; DMA, University of Michigan Ann Arbor

Requiro, David (https://experts.colorado.edu/display/fisid_155785)
Associate Professor/Assistant Professor; MM, University of Michigan Ann Arbor

Rhodes, Harumi B (https://experts.colorado.edu/display/fisid_155971)
Associate Professor/Assistant Professor; Not Listed, New England Conservatory of Music

Riis, Thomas L (https://experts.colorado.edu/display/fisid_100723)
Professor; PhD, University of Michigan Ann Arbor

Roeder, Matthew J (https://experts.colorado.edu/display/fisid_120180)
Associate Professor; DMA, University of Colorado Boulder

Romero, Brenda M (https://experts.colorado.edu/display/fisid_106117)
Associate Professor; PhD, University of California-Los Angeles

Sable, Barbara Kinsey
Professor Emeritus

Sampsel, Laurie (https://experts.colorado.edu/display/fisid_101802)
Professor; MLS, Kent State University

Sawchuk, Terry M (https://experts.colorado.edu/display/fisid_102477)
Associate Professor; MM, University of Michigan Ann Arbor

Schranz, Karoly (https://experts.colorado.edu/display/fisid_103924)
Assoc Professor Attendant Rank/Artist in Residence

Scott, F. Wayne
Professor Emeritus

Shay, Robert S. (https://experts.colorado.edu/display/fisid_154671)
Professor; PhD, University of North Carolina Chapel Hill

Silver, Daniel S (https://experts.colorado.edu/display/fisid_115564)
Associate Professor; MM, University of Michigan Ann Arbor

Smith, Jeremy L (https://experts.colorado.edu/display/fisid_118265)
Professor/Associate Professor; PhD, University of California-Santa Barbara

Spera, Nicolo Ruggero Ferruccio (https://experts.colorado.edu/display/fisid_148406)
Assistant Professor; DMA, University of Colorado Boulder

Spillman, Robert
Professor Emeritus

Stanley, William J (https://experts.colorado.edu/display/fisid_103616)
Associate Professor; DMA, University of Illinois at Urbana-Champaign

Swadener, Marc
Professor Emeritus

Teitelbaum, Benjamin Raphael (https://experts.colorado.edu/display/fisid_151338)
Assistant Professor; PhD, Brown University

Theodore, Michael (https://experts.colorado.edu/display/fisid_113318)
Associate Professor; PhD, University of California-San Diego

Thornton, Michael Robert (https://experts.colorado.edu/display/fisid_116318)
Associate Professor; BM, Temple University

Walter, Douglas W (https://experts.colorado.edu/display/fisid_101811)
Professor; DMA, Temple University

Walther, Geraldine E (https://experts.colorado.edu/display/fisid_142000)
Artist in Residence

Waters, Keith John (https://experts.colorado.edu/display/fisid_107518)
Professor; PhD, University of Rochester

Wetherbee, Charles Tyler (https://experts.colorado.edu/display/fisid_151515)
Assistant Professor; BM, Curtis Institute of Music

Wolzien, Charles
Professor Emeritus

Musical Arts - Doctor of Musical Arts (DMA)

The Doctor of Musical Arts (DMA) is a professional degree for creative and performing students who possess the talent as well as the breadth of knowledge, background, outlook and scholarly capacity requisite to a doctoral program.

Fields of study are composition, instrumental conducting and literature, literature and performance of choral music, performance and performance/pedagogy. Performance and/or performance/pedagogy concentration areas are brass instruments, guitar, harpsichord, organ, percussion, piano, string instruments, voice and woodwind instruments.

For outlines of specific programs, visit the college's Degrees (<http://www.colorado.edu/music/academics/graduate-advising/degrees>) webpage or contact the associate dean for graduate studies, 303-492-8468 or gradmusic@colorado.edu.

Requirements

Prerequisites

Entrance requirements include a master's degree in music or demonstrated background comparable to that of the master of music degree at this university. All graduate applicants must complete an audition, interview, or some other demonstration of their ability in the major field. If at all possible, a visit to the campus is strongly encouraged. As part of the application, composition majors should submit representative scores and recordings (CD format), and a list of completed compositions. Performance majors should submit a repertoire list and arrange for a personal audition and interview, if at all possible. (Some areas require applicants to send a pre-audition screening recording of their performance.) Conducting majors must submit a DVD of their performance. All DMA applicants must also submit a scholarly writing sample that demonstrates ability in critical thinking, appropriate research techniques, and skill in the cogent use of English. For full details concerning audition and application requirements, visit the college's Prospective Graduate Students (<http://www.colorado.edu/music/admissions/prospective-graduate-students>) webpage.

Course Requirements

Students must take a minimum of 30 credit hours of course work, of which at least 18 credit hours are dissertation projects. Students take two doctoral topic classes (at the 6000 level), one each in musicology and music theory; prerequisites are stipulated by the theory and musicology faculties. Some areas require specific course work prior to or in conjunction with work on dissertation projects. In other instances students may be advised to take course work in preparation for the comprehensive examination. Applied music instruction may be elected for the duration of the residency requirement.

Advisory Committee

Each DMA program is directed by a five-member advisory committee headed by the major advisor, who is usually the student's main studio teacher. At least one member must hold the PhD degree in musicology, music theory, or music education.

Residence Requirements

The minimum residence requirement is six semesters of work beyond the attainment of an acceptable bachelor's degree. Two semesters of residence credit may be allowed for a master's degree from another institution of approved standing, but at least four semesters of residence credit, two of which must be consecutive in one academic year, must be earned for course work and/or dissertation work taken at this university.

Not more than one-half semester of residence credit may be earned in a summer session. Students must be registered full-time to earn residence credit. For employed students, only those with one-fourth time or less in work that does not contribute directly to their degree program may earn full residence credit.

Continuous Registration

After the residence requirements for the doctor of musical arts program have been satisfied, a student must enroll for fall and spring semesters of each year until attaining the degree. If a student has enrolled in all required dissertation courses but has still to complete the work, he or she should enroll in TMUS 8019, or TMUS 8029, until the degree is completed.

Degree Plan

A degree plan approved by the advisory committee will be presented to the associate dean for graduate studies no later than the second semester of residence. The student's major professor is responsible for helping the student formulate this plan. The plan should include designated members of the student's doctoral committee, projected remedial and supporting course work, proposed dissertation projects, and tentative dates for the comprehensive and final examinations.

Language Requirement

Each DMA student must satisfy a foreign language requirement, and the one foreign language used to satisfy the requirement must be approved by the student's advisory committee. Additional language work is required for voice students. The language requirement must be completed before students may take the comprehensive exam. Advanced competence in music technology may be approved as an alternative to the foreign language requirement. Appropriate courses and projects are prescribed by the college's music technology faculty. International students whose native language is not English are exempt from the requirement.

Dissertation

The DMA dissertation consists of a specified number of performances, projects, and documents. The student's permanent advisory committee must approve all dissertation projects.

Time Limit

DMA degree work must be completed within six years of first registration.

LAW

Welcome to Colorado Law. We are an engaged, diverse, and inclusive community of students, faculty, staff, and alumni who help one another succeed. Our selective admissions process keeps our student body small, enabling our faculty, staff, alumni, and professional network to invest deeply in each student's success. Because we take our responsibility to educate and train future lawyers very seriously, our curriculum, research centers, and experiential learning opportunities are designed to prepare students for success in today's changing legal environment.

Our students have extraordinary credentials and life experiences (<http://www.colorado.edu/law/node/1759>). In addition to being intelligent, congenial, hard-working, and entrepreneurial, our students are engaged with the community. A plethora of active student organizations (<http://www.colorado.edu/law/node/239>), rich externship opportunities (<http://www.colorado.edu/law/node/117>), and a robust Public Service Pledge Program (<http://www.colorado.edu/law/node/123>) enable our students to foster Colorado Law's tradition of service.

Our faculty (<http://lawweb.colorado.edu/profiles/allFaculty.jsp>) are leaders in their fields and are committed to helping Colorado Law students develop the legal knowledge, critical thinking, writing, and problem-solving skills necessary for professional success. A deliberately low student-to-faculty ratio of 9.9 to 1 enables meaningful engagement between faculty and students, giving students abundant opportunities to develop deep substantive expertise and long-lasting professional relationships.

Our staff is devoted to helping students and alumni succeed. From the moment our students commit to attending Colorado Law and throughout their professional careers, we provide unwavering personal and professional support. Our admissions (<http://www.colorado.edu/law/node/1>) office welcomes students to the Colorado Law community, and our student affairs (<http://www.colorado.edu/law/node/235>) office provides support for students as they develop their professional identity and skills. Our career development office (<http://www.colorado.edu/law/node/177>) helps students secure and retain rewarding employment. Those unsure about their field of interest can rely on our wealth of career exploration opportunities and resources.

Our alumni (<http://www.colorado.edu/law/node/255>) represent Colorado Law in a variety of professional settings and fields across Colorado and nationwide. They thrive in a variety of professional domains: national law firms, regional law firms, government organizations (both at the federal and state levels), business organizations (often utilizing their legal skills in business roles), and public interest organizations. Not only do our alumni thrive professionally, but they also enthusiastically work with current Colorado Law students in a number of key ways that foster students' career success.

We are educating students for success. Our relevant and challenging curriculum prepares students to thrive in a variety of sectors and settings. Our three research centers enable students to develop unique connections and insights in today's most important fields, including:

- Natural Resources, Energy, and Environmental Law and Policy—the Getches Wilkinson Center (<http://www.colorado.edu/law/node/149>);
- Technology and Entrepreneurship/Business—the Silicon Flatirons Center (<http://www.siliconflatirons.com>); and

- Public Law/Public Service—the White Center (<http://www.colorado.edu/law/node/135>).

In addition, our Schaden Experiential Learning Program and Clinical Program (with nine clinics (<http://www.colorado.edu/law/node/53>) representing a range of practice areas) allow students to develop and hone their legal skills through extensive real-world experiences while in school.

We invite you to learn more about what makes the Colorado Law experience (<http://www.colorado.edu/law/node/4079>) so special. Please contact us (<http://www.colorado.edu/law/node/231>) for more information or, even better, come visit us (<http://www.colorado.edu/law/node/219>).

Thanks for taking the time to get to know us better.

Sincerely,

S. James Anaya (<http://lawweb.colorado.edu/profiles/profile.jsp?id=729>),
Dean

About Colorado Law

The University of Colorado Law School, established in 1892, has a long and proud history as a top public law school. The first students of color entered in 1898. The school became a charter member of the Association of American Law Schools, organized in 1901. The first woman graduated in 1908. And the school has been on the American Bar Association's list of accredited law schools since its first publication in 1923.

Today, Colorado Law, housed in the beautiful new "green" Wolf Law Building with one of the largest law libraries in the country, is also one of the most technologically advanced law schools in the country. Most importantly, it provides one of the best comprehensive legal educations in the nation, featuring:

- 510 students, selected from the nation's statistically best applicants with diverse backgrounds and representing 100 undergraduate institutions
- A favorable faculty-student ratio (1:10) that produces class sizes that encourage discussion
- 55 highly published resident faculty dedicated to interacting with students inside and outside the classroom
- First-year students who are placed in small sections for more class participation opportunities and to build relationships with classmates and professors
- Full-time, three-year Juris Doctor (JD) degree, one-year Master of Laws (LLM) degree, eight dual degrees, four certificates, four centers and three journals
- An Experiential Learning Program that integrates lawyering activities, including nine legal clinics, externships, public service pledge and trial and moot court competitions
- Comprehensive program to prepare students for a wide range of careers; many graduates obtain judicial clerkships

Law School Vision

A supportive and diverse community of scholars and students in a place that inspires vigorous pursuit of ideas, critical analysis and civic engagement in order to advance the rule of law in an open, sustainable society.

Our Mission

- **Teaching:** To employ robust theoretical inquiry, doctrinal and policy analysis and professional skills.
- **Scholarship:** To explore and discuss ideas, to develop and test new ideas and approaches, to challenge the status quo and to convey the school's research and ideas to lawyers, academics, policymakers and the world.
- **Public Service:** To instill in students an awareness of a lawyer's civic responsibilities and opportunities to serve and lead.

Wolf Law Building

The five-story Wolf Law Building was completed in 2006 and was only possible through the financing of alumni, friends, law firms and 61 percent by students.

- Top "green" certification, from construction to operation, including 88 percent renewable energy and electricity, 40 percent water use reduction and 59 percent regionally manufactured materials
- Technologically advanced wireless networking, video conferencing, videotaping capabilities for distance learning and digital kiosks
- All classrooms have electrical outlets for each student and complete audio-visual equipment (LCD projectors, DVD, VHS, cable) with built-in touch-screen control systems
- Student commons with café and patio, study and interview rooms, individual lockers and mailboxes, law bookstore and courtyard with barbeque
- Suites and offices for centers, clinics, student organizations, journals and all faculty offices
- 250-seat main courtroom with judge's chambers, 30-seat teaching courtroom with jury box and witness stand and a mock trial practice room for competition and clinic training

The three-story William A. Wise Law Library is housed in the Wolf Law Building.

- Most comprehensive law library in the 12-state Rocky Mountain region, one of the largest in the country, serving as a selective federal government depository
- 40 instructional student lab computers, five group study rooms, 445 seats, distributed computing stations
- 25,000 visitors served per year
- 720,000 volumes and microform equivalents

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- All classrooms have electrical outlets for each student and complete audio-visual equipment (LCD projectors, DVD, VHS, cable) with built-in touch-screen control systems

- Student commons with café and patio, study and interview rooms, individual lockers and mailboxes, law bookstore and courtyard with barbeque
- Suites and offices for centers, clinics, student organizations, journals and all faculty offices
- 250-seat main courtroom with judge's chambers, 30-seat teaching courtroom with jury box and witness stand and a mock trial practice room for competition and clinic training
- Most comprehensive law library in the 12-state Rocky Mountain region, one of the largest in the country, serving as a selective federal government depository
- 40 instructional student lab computers, five group study rooms, 445 seats, distributed computing stations
- 25,000 visitors served per year
- 720,000 volumes and microform equivalents

Student Life

Students who choose the University of Colorado Law School generally seek the very best all-around legal education combined with a great location, a supportive community, top specialties, interdisciplinary study, dedicated faculty, a public service tradition and so much more. Colorado Law is distinguished by the extraordinary quality of its students. As a competitively selective school, its students rank in the top tier, represent a rich blend of geographic and ethnic backgrounds and bring experiences of leadership, career achievement and community service. Although competitiveness among students with such elite qualifications is typical at many law schools, CU Law students have a proud history of putting collegiality first.

Commitment to Diversity

Colorado Law is proud to have been one of the earliest law schools in the nation to graduate lawyers of color. The first students of color entered the University of Colorado Law School in 1898 and the first woman graduated in 1908. Colorado Law's commitment to diversity is evident throughout the Law School. We seek students with not only the academic credentials to excel in a rigorous legal education program, but also a desire to join a diverse community of future lawyers committed to the service of others. Student organizations offer support and networking opportunities.

Academic Support

From the student's first day, Colorado Law invests in her or his academic success. Through the Rothgerber Academic Assistance Program, upper-division law students tutor first-year students in their courses, except Legal Writing and Advocacy. The program is open to all first year students, and more than 50 percent of the class participates in this free opportunity.

Honor System

Members of the legal profession are held to the highest standards of ethical and professional conduct, and Law School faculty and students are expected to maintain the same level of professional competence and integrity in their work. The Colorado Law School Honor Code, subscribed to by all students, is a system of rules administered by student officers and demands the highest ethical conduct. Law students have considerable individual freedom and responsibilities, such as being able to take unproctored exams.

Legal Research and Writing

Colorado Law's Legal Research and Writing Program ensures that its graduates are proficient in legal research, analysis and writing, and

capable of adapting these skills to varying contexts. All first-year Legal Writing and Appellate Court Advocacy courses are taught by resident legal writing faculty, and legal research and research strategy is guided by professional librarian instructors. Upper-division courses are designated as writing classes and students spend a seminar preparing a substantial paper requiring significant legal research and writing.

Journals

Colorado Law is home to three nationally respected student-led law journals. These journals provide legal research, writing, editorial and publishing experience to competitively chosen second- and third-year law students, with a select number of third-year students serving as prestigious Editorial Board members. Subscribers include government agencies, judicial courts, law school and government libraries, judges, attorneys, faculty and alumni.

- *University of Colorado Law Review* (founded in 1928)
- *Colorado Natural Resources, Energy and Environmental Law Review*
- *Journal on Telecommunications & High Technology Law*

Student Organizations

Colorado Law's student organizations reflect the diverse interests and concerns of its active student body. Students increase their knowledge in specific areas, gain leadership experience and work closely with fellow students, faculty, alumni and legal professionals with similar passions. The Student Bar Association serves as the school's student government, represents the interests of law students generally, allocates funding to other organizations and administers the school's honor code with the Honor Council.

- Aerospace Law and Policy Association
- American Bar Association, Law Student Division
- American Civil Liberties Union
- American Constitution Society
- Asian Pacific American Law Students Association
- Black Law Students Association
- Business Law Association
- Christian Legal Society
- Colorado Election Law Project
- Construction and Real Estate Law Association
- Diversity Awareness Now
- Doman Society of International Law
- Environmental Law Society
- Federalist Society for Law and Public Policy Studies
- J. Reuben Clark Law Society
- Jewish Law Students Association
- Juvenile and Family Law Club
- Latino Law Students Association
- Law Students for Reproductive Justice
- Legal Alternative Dispute Resolution Club
- National Lawyers Guild
- Native American Law Students Association
- OUTlaw
- Phi Delta Pi
- Public Interest Students Association
- Republican Law Society
- Sports and Entertainment Law Student Association

- Student Animal Legal Defense Fund
- Student Bar Association
- Student Trial Lawyers Association
- Technology and Intellectual Property Society
- Women's Law Caucus

Career Development

Colorado Law prepares students for a wide variety of careers. The Office of Career Development offers students and alumni individualized career counseling and professional development advice to help them identify and achieve their career goals. The office has career counselors with JDs who have many years of experience in a wide range of law practice areas. It maintains state-of-the-art career development and job search resources and helps students prepare for and pursue job opportunities during and after law school.

Services and Programs

- **Career Counseling:** Each first-year student meets with a career counselor who helps with résumés and job search action plans.
- **Employer Outreach:** Counselors conduct extensive employer outreach in- and out-of-state.
- **Career Fairs/Symposia:** The office organizes employer networking opportunities on and off campus.
- **On-Campus Interviews:** Each year, nearly 70 employers come on campus to interview students for summer clerkships, internships and associate attorney positions with law firms and government agencies.
- **Résumé Collections:** Résumés from interested students are sent to in- and out-of-state employers.
- **Brown Bag Speaker Series:** Practicing attorneys from the local and national legal community are regularly invited to speak to students during weekly lunch-hour informational sessions about what it's like to work in a variety of legal areas.
- **Job Postings:** Through a secure web-based system, students and alumni can review current job listings and an online resources library.
- **Mock Interviews:** Counselors set up appointments with students for practice interviews with the counselors or with volunteer attorneys. Students receive tips and feedback to help them improve.
- **Referrals:** Counselors help students connect with alumni and other legal professionals as resources for information about a field or practice area of law in Colorado or any other part of the country or world.
- **Mentoring and Community Involvement:** The office regularly helps students get involved in the legal community by referring them to mentor programs (including the Student Alumni Mentoring Program), bar associations, Inns of Court and other law-related organizations.

Job Opportunities

Colorado Law helps students pursue numerous job opportunities and helps connect them to valuable part-time and permanent legal positions, including:

- **Externships** are for students working unpaid in the legal community for academic credit, under the supervision of a field and faculty supervisor.
- **Honors programs** are prestigious programs for students and graduates to work within federal government agencies.

- **Judicial clerkships** are prestigious paid positions for new graduates working for judges in federal, state and appellate trial courts.
- **Summer law clerks** are paid part-time or full-time for first- or second-year students in law firms and other organizations.
- **Fellowships** provide funding for law students and graduates to work with public service organizations or academic programs.

Employment During Law School

The study of law is demanding and requires the highest level of concentration. Most students devote 50–70 hours a week to class time and study. Students may be employed for no more than 20 hours per week when enrolled in more than 12 credit hours, in accordance with ABA Rule 304(f).

Experiential Learning

Experiential education encompasses lawyering activities in which students receive experience outside the classroom—clinics, externships, appellate and trial competitions and voluntary public service work. Colorado Law's Experiential Learning Program gives greater coherence to our entire curriculum and builds linkages with faculty involved in experiential education and those involved in traditional classroom teaching.

Legal Clinics

Colorado Law's Clinical Education Program started in 1948 and now serves almost 900 clients each year. Clinics are courses that provide practical learning experiences for our students, much-needed assistance to those less fortunate in our community and invaluable service to the public good. By handling actual cases, students make the transition from legal theory to legal practice, enabling them to take classroom knowledge and turn it into real-world understanding. Under the supervision of expert clinical faculty, student practitioners take primary responsibility for understanding the goals of their clients, and working to represent those clients' interests persuasively and competently. Clinics are available to all interested students.

- American Indian Law Clinic
- Appellate Advocacy Clinic
- Civil Practice Clinic
- Criminal Defense Clinic
- Entrepreneurial Law Clinic
- Family Law Clinic
- Juvenile Law Clinic
- Natural Resources Litigation Clinic
- Technology Law and Policy Clinic

Public Service Pledge Program

Colorado Law is a public institution with a public spirit. The faculty and the students have a passion for and deep appreciation of a lawyer's civic responsibilities to serve the underprivileged and the community. Students who complete a voluntary pledge of at least 50 hours of law-related public service work, not for credit or other compensation, receive recognition on their transcripts. Such service provides students with valuable skills and values, such as legal research and writing, client interviewing and legal argument development. Students can perform pro bono work for any government agency engaged in legal work (administrative agencies, public defenders, district attorney offices and judiciary), nonprofits that provide legal services, public interest law firms or private firms on pro bono projects.

Trial Advocacy and Moot Court

Appellate advocacy, mock trials and moot court competitions help to develop skills in appellate brief writing and oral argument, and gain valuable trial practice experience. Colorado Law teams have consistently been extremely competitive and participate in and host more and more competitions each year. Coaching and support come from an experienced group of faculty, fellow students, alumni who recently competed and judges and lawyers in the community. Students may earn academic credit for their participation. Examples of recent competitions are:

- Constance Baker Motley National Moot Court Competition
- Emory Civil Rights and Liberties Competition
- Hispanic National Bar Association Moot Court
- Jessup International Law Moot Court Competition
- Jim R. Carrigan Trial Advocacy Competition
- Mardi Gras National Moot Court Competition
- National Moot Court Competition
- National Moot Court Competition in Child Welfare and Adoption Law
- National Student Trial Advocacy Competition
- National Telecommunications Moot Court Competition
- The National Trial Competition
- Native American Law Students Association Moot Court Competition
- Pace National Environmental Law Moot Court Competition
- Philip C. Jessup International Law Moot Court Competition:
- The Rothgerber Moot Court Competition
- Saul Lefkowitz National Moot Court Competition

Externships

Students may gain academic credit for performing substantive legal work with government agencies, public institutions and not-for-profit organizations. Students develop professional lawyering skills, gain insight into various aspects of the legal system and profession and cultivate a sense of professional responsibility. While uncompensated, students receive credit hours (1 credit hour per 50 hours of work) toward their degrees.

Research Centers

Widely recognized for its intellectual diversity and originality, the faculty at Colorado Law encompasses an array of prominent legal scholars. The faculty's record of scholarly publication is both extensive and frequently cited. Together with the faculty's commitment to public service, this work has positioned the faculty of Colorado Law to exert important and constructive influences on legal and public policy debates at the local, national, and international levels.

Colorado Law's three research centers have earned national prominence for their research, publications and leading conferences that debate legal and policy issues, foster practical solutions and innovative ideas, facilitate networking and produce scholarship. Students are an integral part of the centers. Students may work as volunteers, externs or research assistants on research projects, reports, newsletters and events. In addition, students will have unique access to national and local policymakers, researchers, scientists, entrepreneurs and legal practitioners in many areas of the law.

Byron R. White Center for the Study of American Constitutional Law

Named in honor of the retired Supreme Court Justice and CU alumnus, the Byron White Center (<http://www.colorado.edu/law/node/135>) for the Study of American Constitutional Law was founded in 1990 to enhance the study and teaching of Constitutional law and stimulate public debate and understanding of our Constitutional system. Each year, the center gathers politicians, academics and practitioners for the Ira C. Rothgerber, Jr. Conference. Recent topics have included home rule, reapportioning Colorado, state initiatives, academic freedom and conscience and the free exercise of religion. The center is the cornerstone of Colorado Law's public service (<http://www.colorado.edu/law/node/1125>) commitment.

Getches-Wilkinson Center for Natural Resources, Energy and the Environment

The Getches-Wilkinson Center (<http://www.colorado.edu/law/node/149>) for Natural Resources, Energy, and the Environment is the 21st century name of the Natural Resources Law Center (NRLC) and crown jewel of Colorado Law's dedication to natural resources, energy, and the environment. The center is dedicated to serving the people of the American West, the nation and the world through creative, interdisciplinary research, bold, inclusive teaching and innovative problem solving in order to further true sustainability for our lands, waters and environment. The Getches-Wilkinson Center is building on the successful legacies not only of the NRLC, but also of other existing programs in natural resources, energy and the environment at Colorado Law.

The Getches-Wilkinson Center regularly hosts an array of conferences and distinguished speakers, including the Annual Martz Summer Conference, the Energy Innovation Speaker Series and various seminars for practitioners and the interested public. Students are invited to join these events and visit some of the center's ongoing projects, such as the longstanding work to improve western water management, to develop and deploy best management practices for oil and gas production and to develop practical strategies and solutions to provide appropriate sustainable energy technologies.

Silicon Flatirons Center for Law, Technology and Entrepreneurship

The Silicon Flatirons Center (<http://www.colorado.edu/law/node/151>) for Law, Technology, and Entrepreneurship is Colorado Law's influential foundation that supports and enables entrepreneurship in the technology community. The center is nationally recognized as a telecommunications law powerhouse. It hosts leading technology policy conferences with legal, technical, regulatory and business experts to elevate the debate around technology policy issues, facilitate networking and develop "human capital" in the Colorado technology community. Students assist on major research projects including the Software Regulation Clearing House and help organize 15–20 events a year on topics such as digital broadband migration, entrepreneurial law and startups, new technology, business plan competition, private equity, software patents and regulatory law and economics.

Admissions

Above all, Colorado Law values leadership, character, diversity and commitment to service in its students. The small size of the Law School—about 170 in each entering class—and the large number of applicants require a very selective admissions process. Admissions decisions are based on many factors, including undergraduate grade point average

(GPA) and the Law School Admissions Test (LSAT) score, and take into account other indicators of ability, motivation and achievement as well. In the faculty's judgment, a diverse student body improves the educational experience of all students.

Application Process

Regular admission applications with all required materials should be submitted starting Oct. 1 and no later than March 15. Find complete application instructions at www.lsac.org (<http://www.lsac.org>) and on the Colorado Law (<http://www.colorado.edu/law/admissions/apply-colorado-law>) website. The Admissions Committee considers regular decision applications beginning in October. Applicants are notified by letter of decisions from early fall until the class is filled. Admission from the waitlist, which is not ranked, can occur as late as August, and the number of offers varies from year to year.

International Students

International applicants have additional requirements as explained on the school's website, including transcripts showing completion of the equivalent of an American bachelor's degree, foreign degree verification and transcript translation, if applicable. The TOEFL is required of all students whose native language is not English, as a thorough and excellent command of written and spoken English is crucial to success in law school. After admissions, international students must submit a financial affidavit stating that they have the financial resources to support themselves while attending school in the United States, since the Colorado Law cannot offer loan assistance to international students.

Transfer Students

Students who have completed at least one full year of study (approximately 30 credit hours) at a law school accredited by the American Bar Association may apply for fall transfer admission to Colorado Law. Typically, applications for fall enrollment are accepted after May 1 and must be received by July 1. The number of transfer students admitted varies each year, and only those who have done very well in their law studies elsewhere have a substantial chance of admission.

Visiting Students

Colorado Law admits some students who are receiving their law degree from another law school to study here for the fall or spring semester or both. Admission as a visiting student is available to applicants who have completed one or two years of high-quality work at another law school and have demonstrated a compelling need to attend Colorado Law. Financial aid for visiting students is usually handled by a consortium agreement between Colorado Law and the degree-granting institution.

Enrollment & Records

Credit Limits

For academic purposes, law students must be enrolled for a minimum of 10 credit hours to be considered full time in the fall and spring. For more information, visit the Colorado Law (<http://www.colorado.edu/law>) website. Law students may apply a maximum of 18 credit hours toward a degree during the fall and spring semesters. For further information and guidelines, students should see specific college and school sections of this catalog. Students who receive financial aid or veterans benefits or who live in university housing should check with the appropriate office regarding course-load requirements for eligibility purposes.

Course Enrollment

When registering for courses, most Law School classes may be located searching under the subject code LAWS.

Withdrawal

Please see the university's Registration & Enrollment (p. 22) section.

Student Finances

All admission decisions are made without regard to students' financial need. Every attempt is made to provide full financial assistance through federal and private educational loans, grants, work-study and scholarships. Students applying for financial aid, private law scholarships or grants based on financial need must complete the Free Application for Federal Student Aid (FAFSA (<http://www.fafsa.ed.gov>)) and submit it to the processor as soon as possible after admission. The priority FAFSA filing deadline is Feb. 1.

Eligible students are awarded Federal Direct Stafford/Ford Loans up to a maximum of \$20,500 per year. Graduate PLUS loans are available to students when financial need exceeds Stafford loan limit. Graduate PLUS loans are federally guaranteed, but unlike Stafford loans, they have good credit requirements for borrowers. Private alternative law loan programs have interest rates and fees that vary according to the lender, the credit rating of the student and whether there is a co-signer. Both loan fees and interest rates may be higher than those of the Stafford Direct loans and there is no cap on interest rates.

Scholarships, Fellowships and Awards

A number of scholarships, fellowships and awards are given annually on a competitive basis for academic and financial considerations. All admitted first-year students are considered for scholarships, as recipients are selected by the Admissions and Financial Aid Committee after an offer of admission has been made. It is possible for scholarships to be awarded through August. Colorado Law also offers some scholarship money to second-year and third-year students each spring. These scholarships are awarded based on academic performance and other criteria, such as economic need and demonstration of assistance in advancing the diversity of the student body.

Programs of Study

Colorado Law's curriculum provides students one of the best comprehensive legal educations in the nation, employing a solid foundation in the fundamentals of law, robust theoretical inquiry, doctrinal and policy analysis, real world experience, legal reasoning tools and professional skills. Our faculty members are passionate about teaching and are committed to providing a well-rounded learning experience that prepares students to serve wisely and with professionalism.

Master's Degree

- Law - Master of Studies in Law (MSL) (p. 1378)

Doctoral Degree

- Law - Juris Doctor of Laws (JD) (p. 1378)

Certificates

- American Indian Law - Graduate Certificate (p. 1381)

- Entrepreneurial Law - Graduate Certificate (p. 1383)
- Health Law and Policy - Graduate Certificate (p. 1383)
- Juvenile and Family Law - Graduate Certificate (p. 1384)
- Natural Resources Law and Policy - Graduate Certificate (p. 1384)
- Tax Emphasis - Graduate Certificate (p. 1385)

Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Aaronson, Norman F.
Professor Emeritus

Bauer, Amy (https://experts.colorado.edu/display/fisid_148723)
Instructor; JD, College of William and Mary

Bernthal, John Bradley (https://experts.colorado.edu/display/fisid_142379)
Associate Professor; JD, University of Colorado Boulder

Bloom, Frederic M. (https://experts.colorado.edu/display/fisid_151709)
Professor; JD, Stanford University

Boyd, William C. (https://experts.colorado.edu/display/fisid_146086)
ProfessorAssociate Professor; PhD, University of California-Berkeley

Briscoe, Georgia K (https://experts.colorado.edu/display/fisid_105331)
Senior Instructor; MA, University of Michigan Ann Arbor

Campos, Paul F (https://experts.colorado.edu/display/fisid_102518)
Professor; JD, University of Michigan Ann Arbor

Cantrell, Deborah Jane (https://experts.colorado.edu/display/fisid_144607)
Associate Professor; JD, University of Southern California

Carpenter, Kristen Ann (https://experts.colorado.edu/display/fisid_147188)
Professor; JD, Harvard University

Chapin, Violeta Raquel (https://experts.colorado.edu/display/fisid_147683)
Clinical Assoc Professor; JD, New York University

Chen, Ming Hsu (https://experts.colorado.edu/display/fisid_149591)
Associate Professor; PhD, University of California-Berkeley

Collins, Richard B (https://experts.colorado.edu/display/fisid_101884)
Professor; LLB, Harvard University

Desautels-Stein, Justin Jacob (https://experts.colorado.edu/display/fisid_147370)
Associate Professor; LLM, Harvard University

Eid, Allison Hartwell (https://experts.colorado.edu/display/fisid_113078)
Instructor Adjunct; BA, Stanford University

England, Margaret Ann (https://experts.colorado.edu/display/fisid_142239)
Clinical ProfessorInstructor Adjunct; JD, University of Denver

Fredericks, Carla Francine (https://experts.colorado.edu/display/fisid_152859)
Clinical Assoc Professor/Instructor Adjunct; JD, Columbia University
Central office

Furman, H. Patrick
Professor Emeritus

Gerding, Erik F. (https://experts.colorado.edu/display/fisid_149723)
Professor/Associate Professor; JD, Harvard University

Griffin, Amy Jo (https://experts.colorado.edu/display/fisid_151695)
Instructor; JD, University of California-Berkeley

Griffin, John David (https://experts.colorado.edu/display/fisid_151708)
Associate Professor; PhD, Duke University

Gruber, Marisa Aya (https://experts.colorado.edu/display/fisid_148523)
Professor; JD, Harvard University

Guruswamy, Lakshman (https://experts.colorado.edu/display/fisid_120000)
Professor; PhD, Univ of Durham (England)

Hart, Melissa (https://experts.colorado.edu/display/fisid_118127)
Professor; JD, Harvard University

Hasen, David Milton (https://experts.colorado.edu/display/fisid_154672)
Associate Professor/Professor; JD, Yale University

Hendricks, Jennifer Susan (https://experts.colorado.edu/display/fisid_151111)
Professor/Associate Professor; JD, Harvard University

Huang, Audrey May (https://experts.colorado.edu/display/fisid_154709)
Clinical Assoc Professor; JD, University of Southern California

Huang, Peter Henry (https://experts.colorado.edu/display/fisid_149792)
Professor; JD, Stanford University

Jacobs, Sharon Bogas (https://experts.colorado.edu/display/fisid_154417)
Associate Professor; JD, Harvard University

Kiernan-Johnson, Derek Huntley (https://experts.colorado.edu/display/fisid_145008)
Instructor; JD, University of Michigan Ann Arbor

Krakoff, Sarah A (https://experts.colorado.edu/display/fisid_109697)
Professor; JD, University of California-Berkeley

Linz, Robert Michael (https://experts.colorado.edu/display/fisid_146868)
Senior Instructor; MS, Florida State University

Loewenstein, Mark J (https://experts.colorado.edu/display/fisid_102088)
Professor; JD, University of Illinois at Urbana-Champaign

Mack, Natalie M (https://experts.colorado.edu/display/fisid_115340)
Senior Instructor; JD, University of Colorado Boulder

Marks, Alexia Brunet (https://experts.colorado.edu/display/fisid_147610)
Associate Professor; PhD, Purdue University

Matthew, Dayna Bowen (https://experts.colorado.edu/display/fisid_129497)
Professor; JD, University of Virginia

Moss, Scott A. (https://experts.colorado.edu/display/fisid_144741)
Professor; JD, Harvard University

Mueller, Christopher B (https://experts.colorado.edu/display/fisid_103756)
Professor; JD, University of California-Berkeley

Nevelow Mart, Susan (https://experts.colorado.edu/display/fisid_149787)
Associate Professor; MLS, San Jose State University

Norton, Helen Louise (https://experts.colorado.edu/display/fisid_144613)
Professor/Associate Professor; JD, University of California-Berkeley

Ohm, Paul K (https://experts.colorado.edu/display/fisid_142996)
Associate Professor; JD, University of California-Los Angeles

Peppet, Scott R (https://experts.colorado.edu/display/fisid_118290)
Professor/Associate Professor; JD, Harvard University

Peterson, Kristelia Garcia (https://experts.colorado.edu/display/fisid_154416)
Associate Professor; JD, Yale University

Ramsey, Carolyn Brooks (https://experts.colorado.edu/display/fisid_118536)
Professor/Associate Professor; JD, Stanford University

Reid, Blake E (https://experts.colorado.edu/display/fisid_152860)
Clinical Asst Professor/Instructor Adjunct; JD, University of Colorado Boulder

Robinson, Colene Flynn (https://experts.colorado.edu/display/fisid_140754)
Clinical Professor/Instructor Adjunct; JD, Loyola University of Chicago

Scanlan-Lyons, Colleen M. (https://experts.colorado.edu/display/fisid_148419)

Schlag, Pierre J (https://experts.colorado.edu/display/fisid_105653)
Distinguished Professor; JD, University of California-Los Angeles

Schmitz, Amy Jean (https://experts.colorado.edu/display/fisid_118136)
Professor; JD, University of Minnesota Twin Cities

Schwartz, Andrew Abraham (https://experts.colorado.edu/display/fisid_146092)
Associate Professor; JD, Columbia University In the City of New York

Selden, Karen E (https://experts.colorado.edu/display/fisid_113311)
Senior Instructor; MLS, Simmons College

Spain Bradley, Anna Katrina (https://experts.colorado.edu/display/fisid_147409)
Associate Professor; JD, Harvard University

Speck, Sloan G. (https://experts.colorado.edu/display/fisid_155972)
Associate Professor; LLM, New York University

Squillace, Mark S (https://experts.colorado.edu/display/fisid_140895)
Professor; JD, University of Utah

Stafford, Gabrielle Marks (https://experts.colorado.edu/display/fisid_115917)
Senior Instructor/Instructor Adjunct; JD, Boston University

Stafford, Todd (https://experts.colorado.edu/display/fisid_120676)
Senior Instructor; JD, Duke University

Surden, Harry Adam (https://experts.colorado.edu/display/fisid_146083)
Associate Professor; JD, Stanford University

Thompson, Jane Ellen (https://experts.colorado.edu/display/fisid_103388)
Senior Instructor; JD, University of Denver

Thorpe, Stephen (https://experts.colorado.edu/display/fisid_158585)
Scholar In Residence

Weiser, Philip J (https://experts.colorado.edu/display/fisid_114575)
Professor; JD, New York University

White, Ahmed A (https://experts.colorado.edu/display/fisid_118146)
Professor; JD, Yale University

Wilkinson, Charles F (https://experts.colorado.edu/display/fisid_100331)
Distinguished Professor; LLB, Stanford University

Courses

LAWS 5064 (2) Legal Analysis

Designed to help students develop the analytical skills necessary for success in law school and on the bar exam. Students will strengthen their core analytical skills, written communication skills, and ability to retain information. The ability to engage legal questions at the highest level is a skill that can be practiced and improved.

Requisites: Restricted to Professional Year 1 Law students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 5103 (1) Legal Ethics & Professionalism: What Kind of Lawyer Do You Want to Be?

Explores both the kind of law students might decide to practice and the ethical, personal and professional commitments central to the practice of law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 5121 (4) Contracts

Covers basic principles of contract liability, offer, acceptance and consideration, statute of frauds, contract remedies, the parole evidence rule, performance of contracts, conditions, effect of changed circumstances, third-party beneficiaries, assignment and specific performance.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 5201 (1) Entrepreneurship, Innovation and Public Policy

Explores cutting edge questions around entrepreneurship, including being an entrepreneur, leadership and what makes a great founding team, building and scaling a business, entrepreneurial communities, financing entrepreneurial companies, leadership in government, entrepreneurship and innovation policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Business

LAWS 5203 (1) Legal Ethics, Professionalism and Creative Problem Solving

Developing reflective, creative problem solving and ethical legal professionals by touching a core set of issues facing lawyers, including the duty of confidentiality to clients and the hazard of conflicts of interest, providing students with an opportunity to confront these challenges in an interactive and engaged environment.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Electives

LAWS 5205 (3) Legislation and Regulation

Introduces lawmaking in the modern administrative state. Examines the way Congress and administrative agencies adopt binding rules of law (statutes and regulations, respectively) and the way that implementing institutions, courts and administrative agencies, interpret and apply these laws. Considers the structure of the modern administrative state, the incentives that influence the behavior of the various actors, and the legal rules that help to structure the relationships among Congress, the agencies and the courts.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 5211 (1) Framing and Legal Narrative

Thinking through the fundamental concepts that inform and animate different areas of law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

LAWS 5223 (2) Legal Writing II

Students prepare appellate briefs and related documents and deliver oral arguments before a three-judge court composed of faculty, upper-division students, and practicing attorneys. Practice arguments are videotaped and critiqued.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5226 (2) Legal Writing I

Provides an intensive introduction to the resources available for legal research. Students also prepare written material of various kinds designed to develop research skills, legal writing style, and analysis of legal problems.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 5303 (4) Civil Procedure

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5313 (3) Civil Procedure 2

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5323 (1) Courtroom Observation Civil

An elective that requires 15 hours observing actual civil proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 5425 (3) Torts

Studies nonconsensual allocation of losses for civil wrongs, focusing primarily on concepts of negligence and strict liability.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 5503 (4) Criminal Law

Studies statutory and common law of crimes and defenses, the procedures by which the law makes judgments as to criminality of conduct, the purposes of criminal law, and the constitutional limits upon it.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5513 (1) Courtroom Observation Criminal

An elective that requires 15 hours observing actual criminal proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 5624 (4) Property

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 5634 (2-3) Property 2

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 5646 (1) Foundations of Legal Research

Moves students from the brief introduction to legal research offered in the first-year legal writing classes to the sort of problem-centered research students will perform starting in the summer after their first year. Provides students with a conceptual understanding of the organization and connectivity of legal authority and with instruction in research methodology at both the project and resource levels.

Requisites: Restricted to Professional Year 1 Law students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 5803 (1) Courtroom Observation International

An elective that requires fifteen hours observing proceedings before an international tribunal(s), attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. The proceedings observed will be available streaming online and the professor will provide information about how to gain access to them.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6001 (4) Commercial Transaction

Grading Basis: Letter Grade

LAWS 6002 (3) Public Land Law

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

Requisites: Requires prerequisite course of LAWS 6112 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6004 (3) Real Estate Transactions

Focuses on legal issues that arise in all phases of real estate transactions, with an emphasis on the role of the lawyer in the business of real estate as well as on the regulation of real estate markets.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 6005 (4) Constitutional Law

Studies constitutional structure: judicial review, federalism, separation of powers; and constitutional rights of due process and equal protection.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6007 (4) Income Taxation

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6700

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6008 (3) Foundations of International Legal Thought

Provides students with a broad historical and philosophical introduction to international law. Addresses changing conceptions of sovereignty between 1492 and World War II, I the contexts of the Spanish conquest of the Americas, the international legality of the slave trade, relations between the Ottoman Empire and the "Great Powers", the Chinese opium wars and the rise of modern international institutions.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6009 (4) Legal Aid Civil Practice 1

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material. Develops working knowledge of courtroom skills.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6011 (3) Payment Systems

Examines the methodology and policies of Articles 3 and 4 of the Uniform Commercial Code, dealing with such topics as negotiable instruments, bank deposits, collections, letters of credit and electronic fund transfers.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6019 (4) Civil Practice Clinic 2

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material. Develops working knowledge of courtroom skills.

Requisites: Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6021 (3) Secured Transactions

Explores the methodology and policies of Article 9 of the Uniform Commercial Code, dealing with financing transactions in personal property.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6024 (3) Real Property Security

Examines basic mortgage law, including use of mortgage substitutes (e.g., deeds of trusts and installment land contracts). Covers foreclosure and redemption and related problems; special priority problems in land acquisitions and construction financing; special financing devices, including variable-interest and wraparound mortgages; and problems relating to the transfer of the mortgagor's and mortgagee's respective interests.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property, Trust and Estate and Land Use

LAWS 6029 (4) Criminal and Immigration Defense Clinic

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6031 (2) Consumer Protection Laws and Policies

Focuses on deceptive trade practices and consumer rights. Reviews the law of deception/misrepresentation at common law, and federal and state laws regarding unfair acts and practices. Covers credit practices, environmental and health claims, and telecommunications and privacy. Discusses remedies, including governmental enforcement actions, and individual and class actions.

Grading Basis: Letter Grade

LAWS 6035 (3) White Collar Crime

Examines distinctions between white collar crime and other types of criminal activity and the needs for and arguments against white collar laws and law enforcement. Studies securities fraud, mail and wire fraud, insider trading, money laundering, false statements, conspiracy and criminal forfeiture statutes. Includes use of the grand jury, privileges applicable in the corporate setting, immunity, discovery and the impact of parallel civil proceedings. Examines effect of government policy on corporations and their counsel, pre-trial and trial strategy, jury selection and victim notification and restitution options.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6039 (4) Criminal Defense Clinic 2

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

Requisites: Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6045 (3) Criminal Procedure

Focuses primarily on the constitutional limitations applicable to such police investigative techniques as arrest, search, seizure, electronic surveillance, interrogation and lineup identification.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6049 (4) Legal Assistance 1: Federal Courts

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

Grading Basis: Letter Grade

LAWS 6055 (3) Post-Conviction Criminal Procedure

Addresses sentencing process and schemes, direct appeals, probation modification and revocation, parole revocation, pardon and commutation processes, post-conviction litigation and appeal in both state and federal court, federal review of state convictions through habeas and/or the AEDPA, and ethical issues that arise in post-conviction proceedings.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6059 (2-3) Legal Aid and Defender

Grading Basis: Letter Grade

LAWS 6060 (3) White Collar Crime Practicum

Addresses the non-trial portion of white collar criminal law. Drawing examples and problems from wire fraud, securities fraud, health care, and computer fraud contexts, explores a white collar case's major investigative and charging phases, corporate and organizational issues, as well as pleas and punishment.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6065 (3) Media, Popular Culture, and the Law

Examines how the institutions, practices, and the very identity of the law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed is: to what extent, and how are the forms and methods of the new media, having an effect on the perception, role and identity of law?

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6069 (4) Immigration Clinic

Emphasizes practice skills in immigration cases. Includes litigation before Federal Immigration judges, Board of Immigration Appeals, and Federal Circuit Court of Appeals.

Requisites: Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

Grading Basis: Pass/Fail

LAWS 6079 (4) Criminal Defense Clinic

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants. Develops working knowledge of courtroom skills, advocacy and evidence presentation. Concludes with full mock trial.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6089 (4) Legal Assistance 2: Federal Courts

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

Grading Basis: Letter Grade

LAWS 6099 (4) Family Law Clinic

Represents low-income clients in family law cases in local state district court. Students will gain court-based experience in dissolution's and allocations of parental responsibilities. Seminar component includes instruction on substantive family law, related ethical issues, and theoretical backgrounds of poverty lawyering.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation, Negotiation Alt Dispute Resolution

LAWS 6103 (2-3) Legal Ethics Professionalism

Examines the legal profession as an institution, its history and traditions and the ethics of the bar with particular emphasis on the professional responsibilities of the lawyer. Discusses the Model Rules of Professional Conduct.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6104 (3) Wills and Trusts

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 6105 (2) Defending Immigrants in Criminal and Immigration Courts

Addresses legal procedures, pleadings and client advocacy matters involved in the representation of Spanish-speaking clients who have been arrested for criminal offenses and who have been issued a detainer by Immigration and Customs Enforcement for possible immigration removal proceedings. Provides overview of criminal defense concepts, and how criminal defense attorneys must be prepared to competently counsel their clients who are facing removal proceedings in the federal immigration system.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 6108 (3) Conflict of Laws

Addresses the conflicts that arise when the significant facts of a case are connected with more than one jurisdiction, whether that jurisdiction belongs to a state, the federal government, or a foreign government. The subject is studied in its theoretical and historical context, with special emphasis on the international aspects of extraterritorial jurisdiction.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6109 (2) Trial Advocacy

Focuses on voir dire, opening statement, direct examination of witnesses and cross examination.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6112 (3) Foundations of American Natural Resources Law

Introduces students to the law of natural resources. Examines the legal, historical, political, and intellectual influences that shape resources development and conservation.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6113 (2) Legal Ethics and Professionalism: Ethics and the Law of Lawyering

Continuation of LAWS 5103. Focuses on the Model Rules of Professional Conduct. Provides the nuts and bolts of the ethical rules needed to begin to explore externships, clinics, pro bono projects and other practice experiences during law school.

Requisites: Requires prerequisite course of LAWS 5103 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6114 (2) Construction Law

Focuses on the basic principles and practices of construction law. Provides an overview of construction industry participants and players (engineers, contractors, insurers) and discusses and analyzes the various obligations and liabilities of these parties. Covers construction and design contracting, construction claims, professional negligence, construction insurance and suretyship and ADR in construction. Provides transactional-practice oriented exercises.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 6117 (3) Survey of Business Enterprise Tax

Makes a comparative survey of federal income taxation of C corporations, S corporations, and partnership/limited liability companies, the principal entity choices for conducting business in the United States. Includes formation, operations, distributions, sales of interests, and liquidation. Suitable for students seeking introductory background for business or real estate practice, without the detail required for a tax specialist.

Requisites: Requires prerequisite course of LAWS 6007 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 6119 (1) Deposition Skills

Provides valuable skills to assume active roles in the deposition process. Explores why and when to take depositions; drafting and objecting to deposition notices for individual deponents, non-party witnesses and corporate designees; drafting successful outlines, proper questions and objections; using exhibits; furthering case theory, making and using stipulations; using depositions in pretrial motions and at trial.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6122 (2) International Natural Resources Law and Policy

Examines the suite of policy issues and legal ramifications associated with sustainable natural resource development. Examines most recent research on the "resource curse" theory. Examines recent policy developments and discussions that have occurred among industry, NGOs, multilateral development agencies and governments. Examines issues related to bribery and corruption in developing country environments and dispute resolution mechanisms at national and local levels.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment Natural Resources

Departmental Category: International Comparative Law

LAWS 6123 (2) Legislative and Policy Drafting

Exposes students to the process of drafting and amending enacted legal texts such as statutes, regulations, and polities of both governmental and non-governmental entities. Students will critically examine lawyers' roles as counselors, advocates and experts in different legislative and policy-drafting contexts.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6128 (1-3) Statutory Interpretation

Examines theories of legislation and the relation between legislatures and courts, emphasizing problems of statutory interpretation and other issues in the judicial use or misuse of statutes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6138 (2-3) Federal Tax Politics

Studies the tax system as the nexus of politics and economics. Examines how various interests and entities use the many tools of political power to shape the tax system. Intended for those interested in politics and legislation, rather than for the tax specialist.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6157 (3) Corporate Taxation

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6450

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6167 (3) Partnership Taxation

Studies federal income taxation of pass-through entities such as are used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6430

Requisites: Requires a prerequisite course of LAWS 6007 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6170 (1) E-Discovery

Exposes students to the legal and practical challenges presented by E-discovery and how electronically stored information shapes litigation and the pretrial process. Students gain an understanding of how electronically stored information can impact an overall discovery strategy and how this complicates a lawyer's ethical and professional obligations.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6179 (2) Trial Practice

Students apply the rules and doctrine of evidence in simulated trial settings. Must be taken with the corresponding section of Evidence. Satisfies the trial practice requirement and counts 2 hours toward the 14 credit hour maximum of clinical hours counted toward graduation.

Grading Basis: Letter Grade

LAWS 6201 (3-4) Agency, Partnership, and the LLC

Surveys agency law whose principles are important in many other areas of law. Studies the legal organizations commonly used by small businesses: partnerships and limited liability companies (LLCs).

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6205 (3) Lawyers for Social Change

Helps students expand their perspective to understand the ways in which lawyers more broadly participate in social change work in this service learning class. Analyzes case histories of cause lawyering. The service learning component is based on the precept that one of the most effective ways to learn a role is to perform that role. Students will participate as social change lawyers by working with a local community to help it develop projects that the community believes will help it better itself.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6206 (3) Litigation Drafting

Examines the intersection of civil procedure and legal writing. Emphasizes the drafting of persuasive adversarial litigation documents, including complaints, answers, motions in limine, motions to dismiss, motions of summary judgment, and jury instructions. Intensive writing and workshop format.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6207 (2) Writing in the Regulatory State

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Grading Basis: Letter Grade

LAWS 6209 (4) Sustainable Community Development Clinic

Provide legal and policy advice, guidance and representation related to sustainable development with a focus on fostering social enterprise, healthy communities and poverty reduction.

Grading Basis: Letter Grade

LAWS 6210 (2-3) Comparative Law

Considers foreign solutions to certain key legal problems. Focuses on general problems of legal process, rather than on substantive rules. Topics include the role of lawyers, civil dispute resolution, criminal procedure and employment discrimination. Covers different legal systems in different years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6211 (3) Corporations

Covers formation of corporations and their management; relations among shareholders, officers and directors; the impact of federal legislation on directors' duties; the special problems of closed corporations.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6213 (2) Advanced Appellate Advocacy

Advanced study and practice of written and oral appellate advocacy. Builds on the foundation established in the required first-year course in appellate advocacy, but provides more extensive coverage, practice and evaluation. Personalized instruction in brief writing, including detailed, one-on-one critique of their work. Include advanced techniques for organizing and writing a brief, and advanced instruction on the strategy and process of oral argument. Required to research, write, and rewrite, an appellate brief and conduct several oral arguments. Attend oral arguments of the United States Court of Appeals for the Tenth Circuit and the Colorado Court of Appeals.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6220 (3) Introduction to Jewish/Israeli Law

Outlines the history and basic principles of Jewish Law, Halakhic system that encompasses Biblical law and the Rabbinic law. Covers Legal Sources of the Jewish laws, interpretation, legislation, custom, precedence and legal reasoning. Explores the study of modern legal system of the state of Israel and examines the problematic nature of the incorporation of the Law of personal status in the Rabbinical and in general courts.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6221 (3) Compliance

Covers requirements for corporate compliance programs and key components of them, including the role of audit committee, internal audit and ethics and compliance. Looks closely at different compliance regimes, including Sarbanes Oxley, the privacy and security components of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the evolution of other data privacy standards and the anti-corruption standards of the Foreign Corrupt Practices Act and the UK Bribery Act.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6223 (3) Research and Writing in the Regulatory State

Focus on developing in students the research, writing and analytical skills necessary to operate within any highly regulated field. Students will work broadly on research and writing skills required in a regulatory practice and narrowly on how that applies to particular areas of expertise, to gain an understanding of a particular area of the law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6226 (1-3) Advanced Legal Research and Writing

Builds on skills learned in the first-year legal writing course to improve written legal analysis. Students will complete multiple written assignments and will receive individual feedback on their work. Sections vary significantly depending on the professor; please check the Legal Writing page of the Colorado Law website to read each professor's course description.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6236 (2) Judicial Opinion Writing

Places contemporary American judicial opinion in historical and comparative context. Analyzes individual and institutional writing choices that authors of judicial opinions must make and ethical dilemmas they must confront. Builds upon the first-year legal-writing curriculum. Challenges students to develop and defend their own opinion-writing approaches and styles as well as to write from approaches and in styles that are not their own.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6246 (2) Introduction to United States Legal System/Legal Reasoning, Research and Writing

Introduces students without a law degree to the basic structure and content of the United States legal system, examining how the three branches of government at the state and federal levels make law and policy in the United States. The course will provide a basic introductory overview of the following: the various sources of law, including an understanding of how statutes are enacted by legislative institutions; the role of the United States court system in interpreting laws; application of judicial precedent in common-law systems; trial and appellate court procedures; and judicial review standards. The course will also introduce students to the methodology of American law, including legal reasoning, research, and writing, through a variety of in-class and outside research and writing assignments.

Grading Basis: Letter Grade

LAWS 6251 (4) Corporations

Covers formation of corporations and their management; relations between shareholders, officers, and directors; the impact of federal legislation on directors' duties; and the special problems of closed corporations.

Grading Basis: Letter Grade

LAWS 6270 (2) Law and Mathematics

Basic mathematical concepts relevant to law: proportions, exponential growth/interest, present value calculations, probability, DNA evidence, basic statistics. Intended especially for students who lack confidence in their math skills, but all are welcome. Basic calculations will be learned, but emphasis will be on the concepts behind mathematical techniques and on relationships between evidence, calculation and truth.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 6271 (1-2) Special Topics: Deals Lab

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite LAWS 6211.

Grading Basis: Letter Grade

LAWS 6280 (1) Intensive Intro to Financial Info, Accounting and the Law: Accounting Boot Camp

Exposes students to the basics of financial accounting and when and how lawyers encounter accounting problems. Students will leave the course with an understanding of the basic framework of accounting, including the double-entry method, balance sheets, income statements, and statements of cash flows, time value of money, discount rates, basic methods of business valuation, and risk and diversification concepts.

Grading Basis: Letter Grade

LAWS 6281 (3) Accounting Issues for Lawyers

Studies accounting and auditing problems in the form they are placed before the lawyer, including a succinct study of basic bookkeeping, in-depth legal analysis of the major current problems of financial accounting, and consideration of the conduct of the financial affairs of business.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6301 (3) Introduction to Intellectual Property

Provides an overview of our nation's intellectual property laws, including patents, copyrights, trademarks and trade secrets. Discusses other matters related to intellectual property, including licensing, competition policy issues and remedies.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5245

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6302 (3) Water Resources

Analyzes regional and national water problems, including the legal methods by which surface and ground water supplies are allocated, managed and protected.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6308 (2) Law and Neuroscience

Covers neuroscience basics and explores the relationship between the law and recent neuroscientific discoveries in domains including pain, memory, lie detection, psychopathy and criminal responsibility.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6311 (1) National Security and Privacy Law

Introduces national security and privacy law and relevant law, regulations, rules, policies, and guidelines.

Grading Basis: Letter Grade

LAWS 6315 (2) The Prosecutor's Role in the Criminal Justice System

Designed to familiarize students with the professional and ethical duties of the prosecutor in the criminal justice system, with the goal of encouraging students to think about the role that prosecutors play. While the focus of the materials and presentations will center on the Colorado criminal Justice system, the concepts and principles addressed translate to all state systems and the federal system. National trends and legislative policy decisions related to criminal law, and their potential impact on public safety and prosecution efforts will also be discussed.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Criminal

LAWS 6318 (3) Economic Analysis of Law

Introduces the basic elements of economic theory and emphasizes demand and utility, cost and optimality.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6321 (3) Computer Crime

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront as they respond to recent explosions in computer-related crime. Includes the Fourth Amendment in cyberspace, the law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal/state relations in enforcement of computer crime laws, and civil liberties online.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6328 (3) Financial Decision-Making

Applies concepts, ideas, insights and principles of modern finance to real-world situations that lawyers will face in many areas of law. Analyzes present discounted value (time value of money), risk versus return, asset diversification, portfolio theory, efficient markets hypothesis, arbitrage, financial options, real options, financial signals, human capital, behavioral finance, socially responsible investing, neurofinance, happiness finance and financial bubbles and crashes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6331 (1) The Technology of Privacy

Explores the escalating debates by policymakers, scholars, advocates and industry representatives about the growing spread of tracking and surveillance in society. Debates are being spurred by the pace of changes to technology and particularly of changes to Internet and mobile technology. Practitioners in information privacy law or technology policy must understand the past, present, and likely future, of the technology of privacy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6338 (1) Understanding the Global Financial Crisis

Explores the causes and consequences of the global financial crisis. Analyzes financial instruments and institutions at the heart of the crisis – including asset-backed securities, credit derivatives, government-sponsored entities, credit rating agencies, hedge funds, and financial conglomerates – and places them in the context of a larger "shadow banking system". Examines the building blocks of financial reform.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6353 (3) Evidence

Studies the methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6361 (2) Information Privacy

Explores the laws that regulate the basic technologies of the internet and the management of information in the digital age. It examines the most significant statutes, regulations and common law practices that comprise this emerging legal framework.

Grading Basis: Letter Grade

LAWS 6363 (5) Evidence and Trial Practice

Studies methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges. Applies rules and doctrine of evidence in simulated trial settings. Combined Evidence and Trial Practice course. Satisfies the trial practice requirement and counts two hours toward the 14 credit hour maximum in clinical hours.

Grading Basis: Letter Grade

LAWS 6373 (3) Federal Litigation: Everything but the Trial

Litigates through all pretrial phases as plaintiff's counsel, a mock federal case: an employee's challenge to compensation and termination, with possible claims including breach of contract, breach of the implied covenant of good faith and fair dealing, violation of wage payment statutory and regulatory requirements, and fraudulent inducement to contract.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6400 (3) International Law

Examines the nature, structure and sources of international law, the relationship between international law and domestic U.S. law, the role of international organizations such as the United Nations, the methods of resolving international disputes, the bases of international jurisdiction, and select substantive areas of international law that may change from semester to semester.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6401 (1) Foreign Corrupt Practices, Anti-Bribery and Anti-Trafficking

Examines Foreign Corrupt Practices Act and similar legal regimes that target bribery and trafficking.

Grading Basis: Letter Grade

LAWS 6410 (3) International Trade Law

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6415 (2-3) Drug Product Liability Litigation: Principles and Practice

Explores product liability lawsuits and litigation. Explores law of product liability and the tools necessary to successfully litigate these cases. Considers the theory and practice of lawsuits now and after the Supreme Courts landmark decision in Wyeth v. Levine (2009). Focuses on similarities and differences between the special context of FDA regulation. Considers the legal principles governing such lawsuits such as inadequate warning, the Learned intermediary Doctrine and medical causation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business and Commercial Law

LAWS 6420 (1) Law and the Holocaust

Explores comparative law, jurisprudence, conflicts of laws and international law. Examines the Nazi philosophy of law emanating from its egregious racial ideology, and how it was used to pervert Germany's legal system to discriminate against, ostracize, dehumanize and eliminate certain classes of people. Studies the role of international law in rectifying the damage by bringing perpetrators to justice and constructing a legal system designed to prevent a repetition.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6458 (2) Creative Writing for Lawyers

Requires substantial writing and reading. Begins with participants bringing to class a piece of creative writing consisting of three to five thousand words. Each session consists of one hour of discussion and critique of an assigned writing exercise that everyone has prepared for the class, and one hour of workshop critique of each participant's longer work, in turn.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6501 (2-3) The Practice of Labor and Employment Law

Focuses on aspects of the practice of employment law, rather than the examination of legal doctrines. Discusses typical issues presented in advising and litigating on behalf of employers and employees. Topics include special attention to ethical issues.

Grading Basis: Letter Grade

LAWS 6502 (2) Wildlife and the Law

Examines the law that protects wildlife, its habitat and biodiversity. Explores human-caused threats including habitat destruction, illegal trade and climate change. Focuses on statutes, case law, environmental ethics, and current controversies to highlight legal, scientific and political strategies for protecting biodiversity. Particular emphasis is placed on the U.S. Endangered Species Act.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6503 (3) Law and Social Sciences

Explores disparities in criminal sentencing and death penalty cases; quality and effectiveness of legal representation for indigent criminal defendants; relationship between modifications in traditional steps in legal process; connection between alternative tort doctrines and volume of litigation, trial rates, plaintiff success rates and award size; impact of congressional statutes and US Supreme Court decisions on handling and outcomes of habeas corpus petitions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6508 (1) The Philosophy of Law

Questions the nature of law, characteristics and considerations of a legal system, rights and from where they come; thinking like a lawyer, basic techniques of legal reasoning, difference between doctrinal and normative legal analysis. Explores law's frontier and what distinguishes law from morality or politics. Focuses on influential texts from the end of WWII to the end of the Cold War.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6510 (2-3) International Environmental Law

Examines international environmental law, including transboundary impacts and global issues. Addresses such issues as intergenerational equities, principles of compensation, and if international environmental norms should receive special environmental norm consideration. A course in public international law is not a prerequisite, but students who have not taken such a course will probably find it useful to do some additional background reading. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6511 (2-3) Labor Law

Relates to labor unions and other collective aspects of employment, including the right of workers to form and join unions, to provoke collective bargaining and to strike and engage other forms of protest. Focuses on domestic law at the federal level and with a particular statute, the National Labor Relations Act, and the workings of particular agency, the National Labor Relations Board. Engages other sources of law, including constitutional law, as well as judicial decisions and other statutes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6513 (2) Crime Victims Rights and Victim Counseling and Advocacy

Involves highly experiential and participatory form of learning related to the rights and needs of victims of crime. Legal and constitutional aspects of crime victims' rights and advocacy are considered. Includes a training component by Moving to End Sexual Assault, a Boulder based organization. After training by MESA, students will complete 120 hours of volunteer service on the MESA hotline as well as attend various meetings.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 6518 (3) Introduction to Islamic Law

Examines the Formative Era of Islamic Law, through its sources and methodologies. Examines the Established Era of the Schools of Law including differences between Sunni and Shiite Islamic Law. Examines human rights, terrorism, political Islam, women's rights and rights of religious minorities, criminal law, and finance law, and the growing role of fundamentalism in these areas. Examines the relevance of Islam and Islamic law in today's world.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6521 (3) Employment Law

Entails a survey of employment-at-will, workplace safety, workplace torts; ERISA and retirement, workers' compensation; controls on hours and wages; health insurance; disability and unemployment compensation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6525 (2-3) Elder Law

The counseling and legal representation of older persons and their representatives. Topics may include: legal aspects of health and long-term care planning, public benefits, surrogate decision making, legal capacity, the conservation, disposition, and administration of older persons' estates, the implementation of their decisions concerning such matters, and the broad ethical issues of representing clients in this field of practice.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 6528 (3) Capital Punishment in America

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6531 (3) Comparative Employment Law

In today's globalized world, lawyers are increasingly likely to encounter issues involving foreign employment. Provides substantive knowledge about foreign employment law and its relation to American law, as well as a comparative framework to assess the relative merits of the American approach to employment law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6540 (3) Global Law & Global Governance

Addresses contemporary theories of globalization. We will explore questions such as: What is globalization, and in particular, what is the globalization of law? What is the extent of legal globalization, and how can we know? Are global law and global governance good things? How are these categories any different from what has traditionally been called "international law"? Our search for answers will be guided by a selection of recent books from theorists of globalization and global governance, such as David Held, Immanuel Wallerstein, and David Kennedy.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6541 (2) Colorado Worker's Compensation Theory and Practice

Introduces the legal theories that underlie the no-fault compensation system, its historical evolution, policy conundrums and ethical quandaries. Teaches the application of the procedural rules most frequently utilized in administrative setting. Studies the Workers' Compensation Act, the Workers' Compensation Rules of Procedure and the Office of Administrative Courts Rules of Procedure.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6551 (3) Employee Benefits and Compensation Law

Examines past and present employee benefits and compensation practices among private and public employers. Covers ERISA and defined benefit, defined contribution and welfare benefit plans; equity awards granted by corporations; equity awards granted by LLCs and partnerships; nonqualified deferred compensation and Section 409A of the IRS; golden parachutes and Sections 280G and 4999 of the IRC.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6555 (2-3) Disability Rights

Examines doctrinal and practical dimensions of disability rights with particular focus on the Americans with Disabilities Act. Emphasizes not only substantive law in area but also applications, including litigation, counseling clients and working with other professionals (e.g., architects) on compliance.

Grading Basis: Letter Grade

LAWS 6601 (3) Corporate Transactions in Latin America

Introduces students to an overview of Latin American commercial and civil law systems, looking closely at Napoleonic and Chilean law. Explores the choice legal structures available for Latin American corporations; contract law that regulates business transactions in Latin America; and exploration of the way in which Latin American countries have joined international business trade agreements that pertain to Latin American nations such as the Vienna Convention and Gatt.

Grading Basis: Letter Grade

LAWS 6602 (3) Cultural Property Law

Concerns domestic and International regulation of property that expresses group identity and experience. Organized around traditional categories of property (real, personal and intellectual), covers historic preservation, archeological resources, art and museum law, with attention to indigenous people's advocacy on burial sites, traditional lands, ceremonies, music, symbols, ethnobotany, genetic information and language. May satisfy upper-level writing requirement.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6702 (1) Climate Justice

Introduces the field of climate justice and seeks to identify legal and policy tools for advancing fair outcomes in climate change decision making. Climate justice is concerned with the intersection of race and/or indignity, poverty, and climate change.

Grading Basis: Letter Grade

LAWS 6708 (1-3) Special Topics

Explores special topics in law.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6712 (3) Climate Change Law and Policy

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions and key issues in policy design. Reviews the Supreme Court's April 2, 2007, decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes and the aftermath in the courts, Executive Branch and Congress.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6722 (3) Energy Law and Regulation

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments and the key federal statutes and regulatory regimes governing natural gas, electricity and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail competition.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6732 (3) Renewable Energy Project Finance and Development

Examines renewable energy and how legal topics impact financing projects. Reviews structure, regulation, and functioning of electric energy industry and laws applicable to development, ownership and operation of renewable energy projects across technologies. Addresses legal policy, economic and financing issues associated with expansion and improvement of the transmission grid to support renewable energy development.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6801 (1) Anti-money Laundering Law

Explores domestic and foreign laws against money laundering, including know your customer and bank secrecy rules.

Grading Basis: Letter Grade

LAWS 6803 (3) Quantitative Methods

Equips students to deal effectively with experts, whether as consultants or as adverse witnesses, and to enable the identification of a quantitative issue. Helps students to become multi-dimensional in quantitative literacy. Enables students to be comfortable reading statistical arguments, performing basic analyses, writing about statistics, expressing quantitative ideas in graphs, questioning an expert, and understanding the power of computer programming.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6813 (2) Problem-Solving, Professional Judgment, and Decision Making

Drawing from materials in psychology, behavioral economics, and mathematics, the course studies a range of patterns, fallibilities, and best practices concerning the complex problems commonly encountered by attorneys. Topics include general problem-solving strategies, techniques for operating in environments of uncertainty and complexity, empirically supported cognitive biases and errors, and strategies for recognizing and overcoming those errors.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6816 (1-2) Problem-Solving and Writing

Enhances students' ability to solve problems and writing concise coherent memos to clients or other legal documents outlining their legal analysis and strategic thinking. Uses diagnostic exams in which students are given multiple documents for fact patterns to begin their analysis.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6823 (1-2) Legal Reasoning

This course of seven 100-minute classes aims to present legal reasoning skills crucial to the crafting and criticism of legal arguments. The classes will cover seven topics: rules and standards, the art of the legal distinction, dealing with legal contradictions, facts and framing, level of abstraction, baselines, and legal interpretation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6836 (1) Special Topics in Legal Research

Builds upon first-year legal research problem solving skills by exposing students to the nuances of research topics in a specialized topic and tracking related doctrinal classes, e.g., environmental and natural resources law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6856 (2-3) Advanced Legal Research

Offers an in-depth look at research resources and methods. Includes sources from the judicial, legislative, and executive branches of federal and state government; research in topical areas such as environmental law, taxation, and international law; and extensive coverage of secondary and nonlaw resources. Covers both print and electronic sources.

Students will have several assignments and a final project.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6866 (1) Colorado Legal Research

Surveys resources and methods to effectively research Colorado law. Covers primary and secondary resources including Colorado statutes, cases and digests, regulations, and constitution and practice materials. Covers how to research Colorado municipal law and other Colorado topics.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6876 (2) Legal Research Skills for Practice

Approaches legal research from a practice-focused perspective using hands-on sessions in the library. Instructs: how to find and use resources specific to a particular practice area; how to evaluate and weigh strengths and weaknesses of the various legal resources available; and, how to use legal resources efficiently. Includes research strategies and methods, primary and secondary resources, and research using library catalogs and Westlaw, Lexis, and other vendors.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6886 (3) Advanced Legal Research and Analysis

Develops students' ability to think critically about and solve current legal problems. Evaluates the benefits and detriments of both print and on-line legal resources, and how to create an efficient research plan. Formulates and applies research strategies to real-world legal problems, and uses legal analysis to refine and improve research results. Note: students who have taken LAWS 6856 may not enroll in this course.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6896 (3) Advanced Legal Research and Writing for Practice

Advances and improves legal research and writing skills learned in first year. Proposes variety of assignment types across substantive and procedural areas to prepare for experiences as summer associates or new attorneys.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 7003 (3) Federal Courts

Looks at structure and jurisdiction of the federal courts, emphasizing problems of federalism and separation of powers and their relationship to resolution of substantive disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7004 (3) Advanced Deals Lab: Real Estate Transactions

Using documents from actual real estate transactions, this course will focus on the drafting and negotiation skills required for the successful practice of real estate transaction law. Students will negotiate and draft actual real estate transactional documents.

Requisites: Requires prerequisite course of LAWS 6004 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 7005 (3) Media Law

Surveys common, statutory, and regulatory law as applied to the mass media. Focuses on the law as it affects the gathering and publishing of news. Also examines the regulation of the electronic media.

Grading Basis: Letter Grade

LAWS 7011 (3) Creditors' Remedies and Debtors' Protections

Examines typical state rights and procedures for the enforcement of claims and federal and state law limitations providing protection to debtors in the process. Includes prejudgment remedies, statutory and equitable remedies, fraudulent conveyance principles and exemptions and other judicial protections afforded debtors.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7013 (2) Supreme Court Decision Making

Students deliberate over several important cases as "Justices" of the Supreme Court. Class is divided into three "Courts" with the first hour spent in deliberation and the second hour in discussion of the deliberative process as well as the substantive issues.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7015 (3) First Amendment

Examines speech and religion clauses of the First Amendment. Includes the philosophical foundation of free expression, analytical problems in First Amendment jurisprudence and the relationships between free exercise of religion and the separation of church and state.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7019 (1-2) Advanced Clinical Practicum

Enables a clinical student an optional 1-2 credit course to complete an ongoing clinic project that does not reach its natural conclusion during the regular term of the clinic. May be used in connection with any existing clinical course, but only with permission, and under the supervision of the clinical faculty member. A clinical student must complete a minimum of 50 hours of work per credit taken.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7021 (3-4) Bankruptcy

Briefly examines nonbankruptcy business rehabilitation devices, followed by basic principles of federal bankruptcy law and the bankruptcy court system. Concludes with attention to business reorganizations under Chapter 11 of the Bankruptcy Code.

Recommended: Prerequisites LAWS 6001 and LAWS 7011.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7023 (2) Jury Selection and History

Studies the history of the jury from ancient times through the implications of Apprendi, the grand jury from the time of Henry II through modern federal practice, and current jury selection procedures, both federal and Colorado, both civil and criminal. Experienced trial attorneys will work with students to demonstrate jury selection.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7024 (2-3) Real Estate Planning

Considers various contemporary legal problems involved in the ownership, use, development and operation of real estate. Emphasizes the income tax and financing aspects of commercial and residential use and development such as shopping plazas and apartment buildings.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 7025 (3) Civil Rights

Presents a comprehensive study of federal civil rights statutes briefly reviewed in other courses (e.g., Constitutional Law or Federal Courts). Studies federal civil rights statutes, their judicial application, and their interrelationships as a discretely significant body of law of increasing theoretical interest and practical importance.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7029 (3) Appellate Advocacy Clinic

Provides a clinical course that enables students to work on briefs of criminal cases being handled by the Appellate Division of the Public Defender or Attorney General's Office. Instruction in oral advocacy is given. Enrollment limited to eight students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7031 (3) Regulation of Financial Institutions

Focuses on the core banking law and works outward to cover a broader spectrum of bank-like financial institutions. Covers bank licensing, restrictions on bank business, regulating safety and soundness of banks, consumer protection of depositors and other bank customers and regulatory examination and enforcement.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7045 (3) Criminal Procedure: Adjudicative Process

Focuses primarily on criminal procedure at and after trial. Looks at bail, prosecutorial discretion, discovery, plea bargaining, speedy trial, jury trial, the right to counsel at trial, double jeopardy, appeal and federal habeas corpus.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7051 (1-3) Transactional Drafting

Focuses on principles of contemporary transactional drafting. Skills gained will be applicable to transactional practice and will also be useful to litigators. Students will learn to translate, draft and review contracts, as well as how to add value to deals.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

LAWS 7055 (3) Education Law

Considers issues raised by the interaction of law and education. Issues may include the legitimacy of compulsory schooling, alternatives to public schools, socialization and discipline in the schools and questions of equal educational opportunities.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7058 (3) Conflict of Laws

Grading Basis: Letter Grade

LAWS 7061 (1) Contract Drafting

Begins with value creation by transactional lawyers and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps, and warranties, capitalized terms, definitions, indemnifications and escrow).

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Business

LAWS 7065 (3-4) Immigration and Citizenship Law

Covers legal issues pertaining to noncitizens of the United States, especially their right to enter and remain as immigrants and nonimmigrants. Topics include admission and exclusion, deportation, and refugees and political asylum. Approaches topics from various perspectives, including constitutional law, statutory interpretation, planning, ethics, history and policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7071 (2-3) Advanced Transactional Drafting

Provides students with the opportunity to further develop skills gained in LAWS 7051 and put them to use in simulations and business contexts across various areas of practice. Students will be asked to draft industry specific contract provisions, revise existing contracts, counsel and negotiate on behalf of clients and work through ethical dilemmas encountered by transactional attorneys.

Requisites: Requires a prerequisite course of LAWS 7051 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 7079 (2) Wrongful Convictions

Focuses on the issues and remedies in cases of people who have been convicted, whose traditional appellate remedies have been exhausted, and who continue to claim actual innocence. Preference given to those who have taken or are taking more criminal procedure courses.

Grading Basis: Letter Grade

LAWS 7085 (2) Law and Religion

Uses judicial decisions as well as historical and theoretical materials to explore significant aspects of the relationship between law and religion. The religion clauses of the First Amendment are a central but not exclusive subject of study. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 7095 (2) Women in Law

Explores the role of women in the legal system by looking at women as parties, jurors, witnesses, lawyers, law professors, and judges. Explores the relationship of law and society to women as victims and offenders. Investigates law and society's response to adoption, lesbian/gay issues, rape, surrogate and bad mothers, and sexual harassment.

Grading Basis: Letter Grade

LAWS 7100 (2-3) International Criminal Law: Theory and Practice

Exposes students to the rapidly growing body of jurisprudence, both international and national, wherein international humanitarian and human rights law are being applied for the purposes of prosecution, trial and punishment of individuals alleged to be responsible for the commission of war crimes, crimes against humanity, genocide and, more recently, terrorism.

Requisites: Requires prerequisite course of LAWS 6400 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7101 (4) Deals: Engineering Financial Transactions

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7102 (2-3) Oil and Gas

Deals with the legal problems associated with private arrangements for the ownership and development of oil and gas: deeds and leases to oil and gas rights, trespass, adverse possession, implied covenants in leases, conveyances of fractional interests, and the interaction of private rights and conservation regulation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7103 (2-3) Ethics and Compliance Capstone

Integrates skills and knowledge from the introductory compliance course and other courses in law school compliance curriculum as students develop a compliance program for an institution.

Requisites: Requires prerequisite course of LAWS 6112 (minimum grade D).

Grading Basis: Letter Grade

LAWS 7105 (3) Family Law

Focuses on nature of marriage, actions for annulment and divorce, problems of alimony and property division, separation agreements, and custody of children. Also considers illegitimacy, abortion, contraception, the status of married women in common law and under modern statutes and relations of parent and child.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7106 (1-2) Moot Court Competition

Offers an intensive involvement in legal research, appellate brief writing and oral arguments in a competitive context. Student finalists may continue involvement in regional and national competitions.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7111 (3) Contract Theory: Collisions of Contracting and Culture

Explores various contract theories and principles emanating from classical and neoclassical law, legal realism, law and economics, critical legal studies, law and society, relational theory, and others. Considers and critiques these theories as applied to particular contracting cultures, especially as applied to construction contracts.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7115 (3) Juvenile Justice

Covers a wide array of issues dealing with the legal rights of the unborn, children and juveniles. Covers the legal status of parent-child abuse, delinquency and crime, and emancipation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7116 (1) Barristers Council

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

LAWS 7121 (3) Advanced Contracts: Commercial Transactions

Studies Article 2 and Article 2A of the Uniform Commercial Code, together with the Convention and the International Sale of Goods. Advanced contracts topics are explored in depth. Among other subjects, warranties, title, remedies and risk of loss in the sale of lease of goods will be studied.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7122 (2-3) Mining and Mineral Development Law

Addresses major issues affecting the development of mineral resources through mining activity. Includes the regulation of the impacts of mining on the environment on both public and private land. Covers the Mining Law of 1872, the Federal Coal Leasing Amendments and state regulation of the impacts of mining on the environment.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7125 (2) Advanced Domestic Relations

Offers advanced study of several domestic relations subjects, including both theoretical and lawyering issues. Tentative subjects include discovery, client interviewing and deposition preparation, asset valuation, working with expert witnesses, children as clients, and alternative dispute resolution.

Recommended: Prerequisite LAWS 7105.

Grading Basis: Letter Grade

LAWS 7126 (1-2) Transactional Competition

Covers a broad array of topics, including, but far from limited to, contract negotiation, health law, mergers and acquisitions, and client counseling. A valuable opportunity for students to gain experience outside the classroom and develop tactics for interacting with clients, negotiation, techniques, and transactional drafting skills. Provides great opportunities for networking. A division of Barristers' Council.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7128 (2-4) Jurisprudence

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 8128

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 7132 (3) Energy, Insecurity, Sustainable Law

Examines why national security deals not only with armed aggression and the ability to thwart military invasions or subversion, but also includes critical threats to vital national and international support systems such as the economy, energy and the environment.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7135 (3) Parent, Child, and State

Examines the legal rights of parents and children in a constitutional framework, as well as the state's authority to define and regulate the parent-child relationship. Addresses rights of parents and children to freedom of expression and religious exercise, termination of parental rights and adoption, paternity orientation and culture in defining the family.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7138 (3) Legal Philosophy

Grading Basis: Letter Grade

LAWS 7145 (3) Comparative Family Law

Examines and critiques law, legal institutions and traditions of the country of focus and the US as they affect children, families, and work. Enhances research and writing skills, including field and international research. Contributes to host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7154 (3) Land Use Planning

Explores mechanisms for public control of private land uses, such as planning, zoning, and regulation of land development; including consideration of federal and state constitutional and statutory limitations on local governments. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 7159 (2) Advanced Trial Advocacy

Offers an advanced course covering trial practice elements. Open only to students who have taken LAWS 6109.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7164 (2) Land Conservation Law

Focuses on private land conservation efforts in the United States, and particularly Colorado, also considers public land conservation programs. Analyzes real property principles and instruments used to protect land, and the development and acceptance of conservation easements in gross as a mechanism for protection, financing mechanisms for land conservation, including direct government funding and indirect funding through tax incentives at the federal, state and local levels. Understanding of Real Property and Tax concepts helpful.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 7169 (2) Motions Advocacy

Provides practical training in preparing and arguing pretrial, post-trial and chambers motions to an experienced federal judge based on materials from actual case files. Assigns some research papers. Limited to 15 third-year students with interest in trial advocacy and willingness to participate in confrontational exercises. Counts as practice hours.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7200 (3) Anthropology of Law

Reviews the relationship between the social and cultural features of both developed and developing country societies and the formal and informal legal institutions within them. Considers the nature of social control and constraint, judicial reasoning, fact finding, conciliation, mediation and arbitration, and legal discourse.

Grading Basis: Letter Grade

LAWS 7201 (3) Antitrust

Studies American competition policy: collaborations among competitors, including agreements on price and boycotts, definition of agreement, monopolization, vertical restraints such as resale price maintenance and territorial confinement of dealers. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7202 (3) Environmental Law

Examines and analyzes important federal pollution control statutes, including the National Environmental Policy Act, the Clean Air Act and Clean Water Act, Solid Waste Act, and Superfund. Considers related economic theory, ethics and policy issues.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7205 (3) Administrative Law

Covers practices and procedures of administrative agencies and limitations thereon, including the Federal Administrative Procedure Act, and the relationship between courts and agencies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7207 (3) Federal Estate and Gift Tax

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6710

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7209 (4) Natural Resources and Environmental Law Clinic

Offers hands-on experience in the practice of natural resources law in the Rocky Mountain region to a select number of clinic students. The clinic's docket of active cases focuses on public land law and the environmental statutes protecting those lands and their resources. Students participate in projects that test the full range of lawyering skills, including traditional litigation, administrative advocacy, legislative drafting, and the conduct of complex negotiations and settlements.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7211 (3) Business Planning

Focuses on the development and use of concepts derived from a number of legal areas in the context of business planning and counseling.

Topics such as formation of business entities, sale of a business, recapitalization, division, reorganization and dissolution are considered.

Requisites: Requires prerequisite courses of LAWS 6007 and LAWS 6201 and LAWS 6251 or LAWS 6211 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7212 (2) Environmental Litigation

Examines the litigation strategies and procedures used to enforce and defend against enforcement under environmental protection statutes, such as the Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, and the Toxic Substances Control Act. Covers civil enforcement, and citizen's suits.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7217 (2) Estate Planning

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6720

Requisites: Requires prerequisite course of LAWS 7207 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7218 (2-3) Legal History

Grading Basis: Letter Grade

LAWS 7221 (2-3) Government Regulation of Business

Covers themes that explore the nature of the regulatory state and the realities of how businesses react to regulation. Provides an understanding of regulatory institutions; the tools of governmental regulation; a critical perspective on regulation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7222 (2-3) Environmental Decision-Making

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 6222

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7228 (2) Intellectual Origins of the Constitution

Examines the views of the Constitution's framers as expressed in contemporaneous and antecedent writings and debates. Offered in alternate years.

Grading Basis: Letter Grade

LAWS 7232 (3) Global Energy Justice

Establishes why nearly a third of the world populated by the energy oppressed poor, presents a major national and international "legislative" or socio political problem calling for answers from governments and civil societies in the developed and developing world. Explains and elucidates the concept of energy justice, its jurisprudential heritage and its meaning and relevance in contemporary society. Case studies present problem solving frameworks spanning the political, social, behavioral, engineering, natural sciences and law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7241 (3) Telecommunications Law and Policy

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5240

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7248 (3) History of Criminal Justice

Explores the social, cultural, and legal history of Anglo-American criminal justice from the 17th to the 20th centuries. Also examines tensions between various methods that historians employ to study crime and law.

Grading Basis: Letter Grade

LAWS 7251 (3) Non-Profit Law

Examines the creation of a non-profit organization, in particular whether to choose a trust or a corporate form, how to qualify for federal tax exemption, and differences between private foundations and public charities. Examines fiduciary duty issues, restrictions on political activity and private benefit, and unrelated business income tax. Addresses tax incentives for charitable giving and state fundraising laws.

Grading Basis: Letter Grade

LAWS 7255 (3) Local Government

Studies state legislative and judicial control of the activities, powers and duties of local governmental units, including home-rule cities and counties, and some problems of federal, state, and local constitutional and statutory limitations on governmental powers when exercised by local governmental units (e.g., the powers to regulate private activities, tax, spend, borrow money and condemn private property for public uses). Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7261 (3) Corporate Finance

Examines a variety of important legal issues related to the funding and financing corporations including creditor protection laws, the Trust Indenture Act of 1939, fiduciary duties, bond indenture provisions, securities laws and rights of equity holders. Covers efficient capitalization structures, corporated valuation techniques, capital markets and the efficient market theory and cost of capital concept.

Requisites: Requires prerequisite course of LAWS 6211 or LAWS 6251 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7271 (3) Venture Capital and Private Equity

Provides overview of the legal and financial principles to represent privately held companies, their founders and managers and their investors. Emphasizes transaction structuring rather than judicial opinions. Includes the organization and financing of start-ups, structuring buyout transactions, exit strategies, legal organization of investment funds and other financial intermediaries. Discusses the relevant regulatory landscape, including securities law, bankruptcy, ERISA and tax law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7285 (2-3) Education and the Constitution

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers and critical thinkers and provides an opportunity to grow as colleagues and teammates.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7055.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Government and Public

LAWS 7300 (2-3) International Litigation

Examines the special issues that arise in litigation in U.S. courts when one or more of the parties is a foreign individual, corporation, or government, or when the subject of the litigation concerns events occurring wholly or partly outside of this country. Includes personal jurisdiction over foreign defendants, extraterritorial service of process and evidence gathering, choice of forum, foreign sovereign immunity, the act of state doctrine, extraterritorial application of U.S. law, and recognition of enforcement of foreign judgments.

Grading Basis: Letter Grade

LAWS 7301 (2-3) Copyright

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5265

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7302 (2) Advanced Oil and Gas

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environment regulation, and the interplay between federal, state and local regulation.

Requisites: Requires prerequisite course of LAWS 7102 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7303 (3) Complex Civil Litigation

Covers civil procedure in modern complex multiparty suits, including class actions in such settings as employment discrimination and mass torts, and problems in discovery, joinder, res judicata, collateral estoppel and judicial management in such suits. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7307 (3) Taxation of Natural Resources

Considers the federal income tax aspects applicable to the exploration for, the development of, and the operation of natural resources, as well as the financing thereof. Also considers oil and gas, hard minerals, timber, and water. Offered in alternate years.

Recommended: Prerequisite LAWS 6007.

Grading Basis: Letter Grade

LAWS 7309 (2-4) American Indian Law Clinic

Offers a clinical education course involving participation in the representation and advocacy of Indian causes – land or water claims, Indian religious freedom, job or other discrimination based on race and issues implicating tribal sovereignty.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7310 (3) International Dispute Settlement

Examines various mechanisms for the settlement of international disputes. Includes negotiation, inquiry, mediation, conciliation, arbitration, and adjudication. Focuses on intergovernmental dispute resolution.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7311 (2-3) Patent Law

Covers selected topics, such as patentable subject matter, patentability and utilization of patent rights through licensing and infringement litigation. Covers practice and procedure of the patent and trademark office.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7312 (2) Advanced Water Law

Builds on the study of basic water law principles for those interested in practicing in this field. Explores in more detail the highly developed legal and administrative system of water law in Colorado and other states, including the use of special courts to adjudicate the existence of water rights and approve changes of use.

Requisites: Requires prerequisite course of LAWS 6302 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7315 (3) Criminal Justice Policy and Practice

Focuses on policy and practice issues rather than case law. Examines how American criminal justice is (and has been) dispensed in the vast majority of cases that never reach trial. Devotes attention to systemic issues rather than case-specific problems. Studies policy behavior, prosecutorial charging and bargaining discretion, the provision of defense services, bail and preventive detention, plea negotiation, and sentencing— aspects of the criminal process that affect huge volumes of cases and require thought in global terms.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Criminal

LAWS 7318 (3) Economics of the American Legal System

Explores the economics of the American legal system. Topics include the cost of producing lawyers, the market for legal services, the practical challenges of running small and large law firms and the government's role in making legal services available.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7320 (3) International Criminal Law

Surveys international human rights law and international crime and punishment. Addresses idea of rights from a historical, philosophical, conceptual and analytical perspective; explores the "Primary rules of conduct" as well as adjudication and remedies, and selected rights from a comparative perspective.

Recommended: Prerequisite LAWS 6400.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7321 (1-2) Patent Drafting and Prosecution

Covers transactions, and often high-tech deals involving intellectual property rights. Studies IP ownership; assignment or rights; commercialization transactions (licensing, distribution, strategic); antitrust; emerging issues. Gives students essential tools to draft and analyze technology contracts.

Requisites: Requires prerequisite course of LAWS 6301 or 7301 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7322 (1) Field Trip of Upper Colorado River Basin for Advanced Water

Spend a week out in the basin meeting and talking with key leaders directly involved in Colorado River Basin water matters, visiting major water projects such as storage facilities and observing their operations, visiting major water users such as irrigation districts and cities, visiting and talking with tribal leaders and touring projects aimed at recovering populations of endangered fish.

Requisites: Requires corequisite course of LAWS 7312.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7323 (2-3) Patent Litigation

Focuses on unique aspects of patent litigation: substantive patent law, civil procedure, federal jurisdiction and litigation strategy; includes claim construction, infringement, anticipation and obviousness defenses, unenforceability challenges, declaratory judgments, injunctions, damages, settlements, licenses and trial strategy. Of interest and useful to those interested in intellectual property generally, not just patents or in litigation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7325 (3) Election Law

Examines the rapidly evolving field of election law: the right to vote, voting procedures, redistricting, candidate selection, campaign finance laws and direct democracy. Emphasizes federal law, including applicable constitutional jurisprudence.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7331 (2) Sports Law

Covers the application of rules from agency, antitrust, contracts, constitutional law (including sex discrimination), labor law, property, torts, unincorporated associations and other subjects to those persons involved in the production and delivery of athletic competition to consumers. Explores the development of the application of these rules to a sports setting and related economic issues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7333 (2) Advanced Evidence: Forensic Science and the Criminal Courts

Explores the admissibility of forensic science opinion and expert testimony, its use as evidence at a trial, and the challenges that such evidence may pose for the courts and the entire criminal justice system in the future.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7335 (1) The Law of Presidential Elections

Examines the laws and regulations that uniquely shape presidential selection, analyzing practical applications as well as the broader constitutional and policy considerations. A combination of federal, state, and local laws shapes how Americans select their president. But more than ever before, Americans are questioning the rules that influence presidential selection, such as the major party primary system, ballot access, presidential campaign financing, and the electoral college.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public Law

LAWS 7341 (3) Trademark and Unfair Competition Law

Examines trademark protection, the interaction of trademark and unfair competition law with other intellectual property doctrines, the requirements for acquiring and retaining federal trademark rights, false advertising and other misrepresentations, the right of publicity and related claims, remedies for infringement, and international aspects of trademark protection.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7345 (2) Comparative Criminal Procedure

Takes an in-depth look at some of the basic features of modern criminal justice systems that share the civil law tradition with the hope that such study will provide a vehicle for a deeper understanding of the strengths and weaknesses of the American system of criminal justice.

Requisites: Requires prerequisite course of LAWS 6045 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7350 (2-3) Analytical Strategies

Develops analytical, writing and problem-solving skills necessary to pass the bar exam and succeed in practice. Designed for third-year law students in their final semester. Students will improve their techniques for analyzing, organizing and writing responses to essay and performance test questions through frequent written exercises and individual feedback on those exercises.

Grading Basis: Letter Grade

LAWS 7361 (2) Cybersecurity

Introduces students to the laws that regulate the basic technologies of the Internet and the management of information in the digital age. It examines the most significant statutes, regulations, and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7365 (2) Comp Constitutional Law

Grading Basis: Letter Grade

LAWS 7371 (3) Standardization and Standards Wars

Examines current issues in the standardization of telecommunications and information technologies. Covers the importance of standards, government and private sector perspectives and the impact of information age technologies on standards of development. Emphasizes key national and international organizations.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7375 (3) U.S. Races and Justice Systems

Examines the unique but related legal, social, and economic problems and accomplishments of those persons in this country whose ancestry originated in Africa, Asia, Latin America, or North America, and explores the developing literature on whites and whiteness.

Grading Basis: Letter Grade

LAWS 7381 (3) Intellectual Property Counseling and Licensing

Introduces strategic development and procurement of IP, including patents, trademarks, copyrights, and trade secrets. Evaluates the latest cases and legal trends from a practical and strategic perspective. Focuses on widely accepted best practices and critical thinking in these areas.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property, Technology Telecomm

LAWS 7401 (3) Securities Regulation

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7402 (2) The Law of Toxic and Hazardous Wastes

Examines the EPA's federal hazardous waste statutes, including the Resource Conservation and Recovery Act of 1976 (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Analyzes the RCRA "Cradle-to-grave" hazardous waste program and addresses the evolving CERCLA liability scheme and cleanup process.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7405 (2-3) Health Law 2: Medical Malpractice and Quality Regulation

Explores (1) the law controlling ethical issues that arise during the delivery of medical care, (2) the substantive law of medical malpractice and tort reform aimed at reducing the frequency and severity of medical malpractice verdicts, and (3) the practical aspects of litigating a medical malpractice case. Cross-listed at the Health Sciences Center; will include field trips there.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7406 (1) International Moot Court Competition

Open only to students who actively participate in the seminar preparing for the competition, in the preparation of memorials for the competition, and in the practice of oral arguments or regional oral arguments.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7407 (1-3) Tax Policy

Explores current issues in tax policy. Topics may include the tax legislative process, consumption taxes, taxes and distributive justice, the tax exemption for nonprofits, carbon taxes, corporate taxes and integration, and taxes and entrepreneurship. There are no required prerequisites, but Federal Income Tax will be helpful.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7409 (3) Legal Negotiation

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7411 (2-3) Mergers, Acquisitions and Reorganizations

Studies the planning of corporate mergers, acquisitions and reorganizations, examining the application and integration of state corporate law, federal securities law, accounting principles, tax law, labor law, products liability law, environmental law, ERISA and antitrust law.

Equivalent - Duplicate Degree Credit Not Granted: BADM 6900

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7415 (2) Bioethics and Law

Grading Basis: Letter Grade

LAWS 7420 (2) European Union Law

Covers all the essential aspects of the EU law: EU institutions, competences, the making and the application of EU law, and the content of the fundamental principles of EU law and the common market.

Grading Basis: Letter Grade

LAWS 7425 (2-3) Health Law and Policy: Access, Cost, Quality, Choice

Acquaints students with the issues arising at the interface between law and medicine through analysis of cases and other materials. Critically analyzes methods used by courts and legislatures to address medical/legal problems in an effort to determine whether the legal resolution was reasonable and appropriate in light of medical, social and political considerations. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7426 (2) Health Care Compliance

Introduces students to a number of primary laws and regulations that give rise to the vast majority of serious fraud and abuse cases. The primary statutes and regulations implementing them will then be viewed from the context of common problems in the health care industry such as: up-coding, unbundling, worthless services/quality of care, medically unnecessary care, over-utilization, joint ventures with referral physicians, off-label marketing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7428 (3) Bioethics Law and Literature

Interdisciplinary study of law, medicine, and bioethics. Addresses such issues as confidentiality in medical treatment, rejecting life-sustaining treatment, death and dying, reproductive law and genetic technology, human experimentation, and access to health care.

Grading Basis: Letter Grade

LAWS 7429 (2) Alternative Dispute Resolution

Examines a variety of dispute resolution processes, such as mediation, arbitration, minitrials and court-annexed settlement procedures, as alternatives to traditional court adjudication.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7431 (3) Corporate Finance

Grading Basis: Letter Grade

LAWS 7433 (3) Remedies

Examines the types of relief available to vindicate various rights. Covers damages, specific performance, injunctions, and restitution. Emphasizes the planning aspect of enforcement, in view of the limitations and problems of proof associated with specific remedies.

Grading Basis: Letter Grade

LAWS 7439 (2-3) Mediation

Explores mediation, one of the more important methods of alternative dispute resolution and the legal issues that may arise related to mediation. Considers what kinds of persons and disputes are most appropriate for mediation. Includes role playing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7440 (3) International Human Rights and Humanitarian Law

Surveys international human rights both in law and in philosophy, both current and historical.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7445 (2) Insurance Law

Grading Basis: Letter Grade

LAWS 7449 (2-4) Juvenile and Family Law Clinic

Examines the world of child welfare from the view of the child client, by representing their best interests in abuse and neglect cases. As Guardians ad litem, students will represent children in abuse and neglect cases from the beginning, at the temporary shelter hearing, through the conclusion of the case at a permanency orders hearing.

Repeatable: Repeatable for up to 8.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7451 (3) Law and Finance for Entrepreneurs

Studies unique legal problems faced by entrepreneurs, including formation issues (choice of entity, rights of the founders, initial investors), operation issues (governance, key employees, intellectual property, financing), IPOs and buy-outs.

Equivalent - Duplicate Degree Credit Not Granted: BADM 6910

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7458 (2) Law and Literature

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka, and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal, and a final eight page paper are required.

Grading Basis: Letter Grade

LAWS 7461 (1) Dispute Resolution in the Digital Age

Explores the need for expanded and equalized access to remedies in consumer cases, and how the internet opens doors to online dispute resolution ("ODR") systems that utilize cost-effective negotiation, mediation, and arbitration processes for resolving complaints. This course will look at the various systems currently used by major companies, as well as the rules and treaty developments in global markets.

Grading Basis: Letter Grade

LAWS 7465 (2) Public Health Law and Ethics

Explores the legal and ethical dimension of public health. Focuses on topics that generate legal and ethical controversies, including governmental duties to protect citizens, nature and the extent of the government's ability to regulate conduct and responses to epidemics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7475 (2) Advanced Torts

Studies selected tort actions and theories. Topics covered may include "Dignitary torts" (e.g., defamation, privacy, etc.), business torts, and product liability. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7505 (2) Sexuality and the Law

Examines the regulation of sexuality in local, state, and federal law, with particular emphasis on sexual orientation. Explores how sexuality shapes, and is shaped by, an array of laws and policies, which may include family law, military regulations, tax law, employment law, trusts and estates, obscenity law, and criminal law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7507 (2-3) State and Local Taxation

Examines the operation of the income, property and sales tax used to finance our state and local governments. Includes requirements of equal protection and due process. Covers jurisdiction to tax allocation of the tax base among different state and local governments.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6760

Grading Basis: Letter Grade

LAWS 7509 (1) Mock Trial Competition

Student teams further develop trial and advocacy skills in a competitive mock-trial format involving two or more rounds of trials. Requires preparation of trial briefs and drafting other court pleadings and documents. Credit is limited to the top two teams (six students). Student finalists may continue involvement in regional and national competitions.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7512 (2) Advanced Environmental Law: Air Pollution

Provides an examination of efforts to regulate air pollution in the United States under the Clean Air Act. Covers key provisions, basic approach of cooperative federalism, role of science and risk assessment establishing health-based standards, implications of instrument choice and regulatory design on innovation and economic growth, development of 'first generation' climate policies, and new approaches to compliance and enforcement.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7513 (3) Domestic Violence

Explores the law, policy, history and theory of domestic violence. Examines the limits of legal methods and remedies for holding batterers accountable and keeping victims safe; the dynamics of abusive relationships; the history of the criminal justice system's response to domestic violence; the defenses available to battered persons who kill their abusers; the legal paradigm of the sympathetic victim; psychological and feminist theories about abusive relationships; civil rights and tort liability for batterers and third parties; and the intersection of domestic violence with international human rights.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7515 (3) Poverty Law

Explores the legal and policy responses to poverty in the United States and addresses how the law shapes the lives of poor people and communities. Examines the extent of poverty in the United States, the root causes and the historical development of social welfare policy. Focuses on the rights-based aspect of poverty law and various policies that attempt to ameliorate poverty.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7520 (3) Food Law and Practice

Surveys the basic regulatory landscape of food law with insight into critical legal issues facing industry and consumers. Covers federal, state and municipal regulation, litigation, government incentives, international standards and soft-law. Combines doctrinal approaches with simulation and problem solving to introduce systems-level thinking. No prerequisites or prior knowledge if required, though interest in food law and corporate law are helpful.

Grading Basis: Letter Grade

LAWS 7523 (2) Juvenile Law

Takes a critical look at the juvenile justice system and how it responds to the needs of juveniles who are either delinquents and/or victims of abuse. Issues include the rights and responsibility of parents, parental responsibility programs, delinquents, and the future of our juvenile courts.

Grading Basis: Letter Grade

LAWS 7525 (3) Race and American Law

Examines the judiciary's approach to racial discrimination from America's colonial period to the present day. Concludes with an analysis of the contemporary status of racial subordination in the legal system and considers recent scholarly critiques of the law's limitations in effecting racial justice. Employs an interdisciplinary approach and covers the experiences of American Indians, African Americans, Asian Pacific Americans and Chicana/os.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7529 (1) Appellate Advocacy Competition

Gives students the opportunity to participate in an intermural appellate advocacy competition, in which a brief must be filed and reviewed, critiqued, and deemed credit-worthy by a member of the faculty. (Law School Rule 3-2-9 (b) should be consulted prior to enrollment.)

Grading Basis: Pass/Fail

LAWS 7535 (2) Poverty, Health and Law 1

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, health, violence, and immigrants. Students will also help with intake of clinic patients and support client representation by the attorney of record.

Grading Basis: Letter Grade

LAWS 7541 (2-3) Employment Discrimination

Examines statutory and constitutional prohibitions of discrimination in employment on the basis of race, gender, age, religion, national origin and disability.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7545 (2) Poverty, Health and Law Practicum

A service learning course in which students draw from the substantive materials studied in LAWS 7535 to develop competency in case planning, problem solving, cooperative decision making, and client counseling. Students will staff cases under the supervision of a CO Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS.

Requisites: Requires prerequisite course of LAWS 7535 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7551 (2) Trade Secrets

Examines law of trade secrets and how companies and entrepreneurs use this field to protect intellectual property in conjunction with other forms of legal protection (e.g., patent, copyright and trademark).

Grading Basis: Letter Grade

LAWS 7555 (4) Poverty, Health, and Law Practicum

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, and health. Students will also staff cases under the supervision of a Colorado Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS, and will develop competency in case planning, problem solving, cooperative decision making, and client counseling.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7565 (3) Corporate Transactions in Health Law

Introduces key corporate and regulatory issues impacting the delivery of health care. Focus will be transactional, with students gaining an understanding of basic corporate law and regulatory principles, and then learning to integrate core federal and state laws into choice and use of corporate structures and operational strategies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7601 (2-3) Business Transactions

Provides a practical understanding of how to apply the law in both transactional and litigation settings. Gives an interdisciplinary look at how various areas of the law are brought together in common factual settings. Teaches students to negotiate, document and close the acquisition of a business covering the areas of practice of corporate, contracts, real property, secured transactions and bankruptcy law. Tests, in a litigation setting, the decisions made during the acquisition stage.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7605 (2) Refugee and Asylum Law

Focuses on protections offered under international and domestic law for persons who are threatened by persecution or other adverse conditions in their country of origin. Covers who is a refugee and the protections they have or do not have under United States and international law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7609 (1-2) Law Practice Management

Studies the establishment of a solo or small-firm legal practice. Topics include the business structure (PC, LLC, etc.), office systems, marketing and development, staffing, liability insurance, managing time, technology and billing. (This practice course counts toward the 14 credit hour maximum of practice hours.) Course supported by the Section of Law Practice Management of the ABA in memory of Harold A. Feder, CU Law '59.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7611 (2-3) International Business Transactions

Examines the sources of international business law, the relationship between such law and the U.S. legal system, the choice of law in international business disputes, the special issues that arise when doing business with foreign governments, the law governing international sales and the shipment of goods and international intellectual property protection. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7615 (4) Immigration Law and Immigrants' Rights

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7181

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7617 (3) International Taxation

Covers basic aspects of the United States taxation of income earned abroad by its citizens and the taxation of income derived by foreign persons from U.S. sources, including the implications of income tax treaties.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6780

Requisites: Requires prerequisite course of LAWS 6007 or 6157 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7618 (1) Marijuana Law and Policy

Covers three distinct but interwoven topics: substantive law governing marijuana; policy rationales behind and outcomes produced by different approaches to regulating the drug; and the legal authority to regulate the drug. The objective is to prepare to handle legal issues that arise in practice but also to provide informed counsel on proposed an future reforms to the law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 7619 (3) Entrepreneurial Law Clinic

Provides law students with practical experience in transactional law while offering valuable legal services without charge to local startup businesses lacking access to legal resources. Enrollment priority is given to third year law students. The ELC professor may set forth additional requirements to ensure that students are qualified to provide services to ELC clients.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7629 (1) Introduction to the In-House Practice of Law

Explores cutting edge questions around the practice of law as an employee of a business. Demonstrates how the combination of law and business can be valuable to businesses and also innovative, challenging and rewarding to legal professionals. Legal services to corporate America is changing dramatically with more entities relying on in-house counsel, compared to private practitioners, to obtain legal advice and counsel.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7709 (3) Advanced Legal Negotiation

Deepens students' understanding of the economic, psychological, cultural, and critical literatures related to legal negotiation and bargaining, provides students an advanced set of negotiations, experiences and simulations that introduce new dynamics and problems not dealt with in the core course, and deepens students' self-understanding and ability to learn from experience.

Requisites: Requires prerequisite course of LAWS 7409 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7715 (3) Indigenous Peoples in International Law

Studies developments in the substance and procedure of international human rights law pertaining to indigenous peoples, examining these developments through varying perspectives, doctrinal and political, pragmatic and critical. Students will become familiar with indigenous peoples' involvement in the human rights movement both before and after WWII, and corresponding developments in the United Nations, Organization of American States, and other institutions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7718 (2) The Regulation of Marijuana

Covers three distinct but interwoven topics: substantive law governing marijuana, policy rationales behind and outcomes produced by different approaches to regulating the drug and the legal authority to regulate the drug. Prepares one to handle legal issues that arise in practice, but also to provide informed counsel on proposed and future reforms to law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7725 (3) American Indian Law I

Investigates the federal statutory, decisional and constitutional law that bears upon American Indians, tribal governments and Indian reservation transactions.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7735 (3) American Indian Law II

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom, and tribal natural resource and environmental management.

Requisites: Requires prerequisite course of LAWS 7725 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7745 (2-3) Jurisdiction in Indian Country

Examines the current state of the justice system within Indian nations today. Includes understanding the respective roles of tribal and state law enforcement authorities, as well as the Bureau of Indian Affairs' Office of Justice Services, the Federal Bureau of Investigation, and the Drug Enforcement Administration. Examines relationship between federal and tribal courts; substantive laws; and advocates who appear before them.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7751 (3) Arbitration

Discusses the nature of arbitration, enforcement of arbitration agreements and awards, complexities of multi-party arbitrations, fairness and efficiency of the arbitral process and other issues related to arbitration's prevalence in contexts ranging from corporate to consumer and employment disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7765 (3) Gender and Justice

Grading Basis: Letter Grade

LAWS 7775 (1) Gender Law and Public Policy

Examines the relationship of law and gender in criminal law, and constitutional law, using feminist theoretical perspectives as the organizing principle. Each perspective is applied to cases and material on such topics as violence against women, prostitution, pornography, and discrimination in education and athletics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7801 (1) Tech Policy Advocacy

Provides an intensive, one-week look at the substance, strategy, tactics, and import of technology policy advocacy. Each year, we will study one particular theme or conflict and examine it in-depth. The point of studying one particular episode is to learn lessons about the practice of technology policy advocacy that apply beyond this one historical moment. This class is meant to combine traditional doctrinal approaches with an experiential focus.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7809 (2-4) Technology Law and Policy Clinic

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5250

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7846 (1-3) Independent Legal Research

Involves independent study and preparation of a research paper under faculty supervision. Students produce a research paper equivalent to a seminar research paper. A draft is submitted, subjected to critique by the faculty member, and redrafted. Available during or after the fifth semester of law school. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 7896 (1) Journal: University of Colorado Law Review

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the University of Colorado Law Review.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7906 (2) Journal: University of Colorado Law Review

Gives students the opportunity to participate in the research, writing, and editing activities involved in publishing the University of Colorado Law Review.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7916 (1) Journal: CO Natural Resources, Energy & Environmental Law Review

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7926 (2) Journal: CO Natural Resources, Energy & Environmental Law Review

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7936 (1) Journal: Colorado Technology Law Journal

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7939 (1-7) Extern Program

Extern credit may be earned for uncompensated work for a sponsor, which may be any lawyer, judge, or organization that employs lawyers or judges and is approved by the Academic and Student Affairs Committee. Work is done under the direction of a field instructor (a lawyer or judge as the sponsor) and a member of the law faculty. Requires a substantial writing component and 50 hours of working time per credit hour. a minimum of 1 and a maximum of 7 credit hours may be earned. Classified as practice credit.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7946 (2) Journal: Colorado Technology Law Journal

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 8005 (2) Seminar: Advanced Constitutional Law Equality and Privacy

Addresses "Equal Protection" rights under the Fourteenth Amendment and "Privacy" rights to personal autonomy. Analyzes varied constitutional grounds for recognizing or rejecting abortion rights; limits on Congressional power to pass civil rights laws granting broader rights than the Fourteenth Amendment does; treatment of sexual orientation-related laws and government actions as "Privacy" versus "Equality" matters; and "Benign"/"remedial" race- and sex-based government decisions such as affirmative action and same-sex schools.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8011 (1-3) Seminar: Humanizing Contracts: Service Learning

Examines contract theory and policy, while providing community-based service. Students analyze and discuss readings exploring doctrinal and theoretical bases of contract law, and see "Contracts in action" through participating in a service project. Requires a final paper linking theory and doctrine with service experiences. Note: this is a year-long seminar (2 credits per semester); students must enroll in both semesters but receive only one grade at the end of the year. Students participate in a service project that may include off-campus and weekend participation.

Grading Basis: Letter Grade

LAWS 8013 (2) Seminar: Habeas Corpus: The Great Writ of Liberty

Includes readings on the history of the writ, its constitutional status, and its use as a civil rights remedy, as well as case studies of important Supreme Court decisions, and a review of contemporary jurisdictional and procedural issues.

Grading Basis: Letter Grade

LAWS 8015 (1-3) Seminar: Constitutional Theory

Examines the role of the courts and the other branches of government in defining and enforcing constitutional values. Relevant readings are from philosophy, social sciences, and legal scholarship, as well as cases.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8021 (2-3) Consumers and the Law

Expands understanding and analysis of contracts beyond the basic concepts learned in the first-year contracts course. Explores norms, goals and functions of consumer law and also observes the law "in action" through a class blog and outreach with the Boulder County Department of Housing and Human Services ("BCDHHS"), who assists people throughout Boulder County with an array of financial, housing and other consumer issues.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8025 (2) Seminar: Advanced Topics in Federalism

Explores the development of "Our Federalism", the relationship between federal and state governments, from the founding period of the US Supreme Court's recent New Federalism jurisprudence. Studies historical material, commentary, and case law and addresses how federalism is defined; the values that federalism serves; the role of federalism in our interconnected, global society; the Supreme Court's boundaries of federalism; the direction of New Federalism.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8035 (2) Seminar: Intersection of Antidiscrimination and First Amendment Law

Addresses past and continuing debates involving potential tensions between antidiscrimination principles and free speech, free exercise and establishment clause values. Examines constitutional protections under the First Amendment and the equal protection clause, together with an array of existing and proposed federal and state antidiscrimination laws regulating employment, housing, and public accommodations, among other areas.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8036 (2-3) Special Topics in Intellectual Property

Applies copyright doctrine to the digital music contexts. Topics may include but are not limited to radio, compulsory licensing, performance rights, sampling, user generated content, term extension, termination rights, "open-access" and the public domain, emerging technologies and infringement, social implications of copyright legislation, digital fair use and the first sale doctrine and moral rights for users and artists.

Requisites: Require a prerequisite course of LAWS 6301 or LAWS 7301 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 8045 (2) Seminar: Comparative Constitutional Law

Examines legal structures and concepts typically found in constitutions, including judicial review, distinction between legislative and executive authority, federalism and the principle of subsidiarity, the relationship between church and state, free speech and press, and social welfare rights. Examines differences between constitutional law and other domestic law, role of comparative constitutional law in domestic constitutional law adjudication. Emphasizes American and Swedish perspectives.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8055 (1-2) Seminar: Media, Popular Culture, and the Law

Examines how the institutions, practices and the very identity of law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed in this seminar: to what extent and how are the forms and methods of the new media having an effect on the perception, role and identity of law? This is a year-long seminar.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8060 (3) Poverty and Inequality in Comparative Perspective

Investigates the nature, causes, consequences and major responses to persistent poverty and inequality in the United States and several other countries. Students are expected to write short response papers for each assignment as well as a substantial research paper on a topic selected in discussion with the instructor.

Grading Basis: Letter Grade

LAWS 8065 (2) Sem White Collar Crime

Grading Basis: Letter Grade

LAWS 8075 (2) Seminar: Race, Racism, and American Law

Focuses on issues of race reform law, in particular the group of issues dealing with Black Americans. (Students of all hues and persuasions are welcome.) Offers an interpretive or critical dimension, rather than a litigation-oriented one. Helps students understand how race reform law works and how attitudes and historical forces have shaped that body of law.

Grading Basis: Letter Grade

LAWS 8085 (2) Sem Crit Race Theory

Grading Basis: Letter Grade

LAWS 8095 (2) Seminar: Problems in Constitutional Law

Explores how theories of social freedom and self-governance developed in the United States. Analyzes the most controversial socio-legal issues as they relate to privacy, equal protection and other questions of substantive due process. Discusses recent trends in national security and information privacy to evaluate their overall relevance to civil liberties and nascent influence on the fundamental rights debate in the US and abroad.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8101 (3) Business Law Colloquium

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8103 (2) Seminar: Alternative Dispute Resolution Ethics

Explores the ethics of mediators and other alternative dispute resolvers and facilitators, of attorneys representing clients in alternative dispute resolution processes, and of judges serving in alternative roles. Issues include confidentiality, providing appropriate notice to those concerned, and avoidance of conflicts of interest.

Grading Basis: Letter Grade

LAWS 8104 (2) Seminar: Cities, Suburbs, and the Law

Explores dynamics that play out in the relationship between cities, suburbs, exurbs and other patterns of urban development. Explores the nature of local power, relations between local jurisdictions, and metropolitan and regional approaches to governance. Includes fiscal disparities, ethnic and racial segregation, sprawl and growth controls, affordable housing, transportation, and the urban/rural divide.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 8105 (3) Seminar: Comparative Family Law

Examines and critiques law, legal institutions and traditions of the country of focus and the U.S. as they affect children, families and work. Enhances research and writing skills, including field and international research. Contributes to the host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8110 (2) Fascism and the Liberal State

Explores fascist legal theory and its critiques of the liberal democratic state. Readings of major conservative, liberal, fascist, Nazi and Marxist theorists including Marx, Gentile, Fuller, Neumann, Schmitt, Agamben, Hayek and Mill. Understand from a variety of perspectives, the structure and character of the liberal democratic state, its strengths and weaknesses as well as its susceptibility of fascism.

Grading Basis: Letter Grade

LAWS 8111 (3) Sem: National Security Law and US Foreign Policy

Explores the legal frameworks influencing the development of national security policy and U.S. foreign policy. Students will be introduced to applicable U.S. Foreign Relations Law, U.S. National Security Law and International Law before considering how such apply and interact in response to current threats to national security.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8112 (2-3) Seminar: Advanced Natural Resources Law

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary, and scientific materials. Includes field-trip, and requires additional field trip expenses. Department enforced prerequisites or corequisites: any two of the following: LAWS 6002 or LAWS 6112 or LAWS 6302 or LAWS 7725.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite LAWS 6112.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8115 (2) Seminar: Child Abuse and the Law

Explores legal responses to child abuse by examining the constitutional framework for legal proceedings, effective strategies for preventing child abuse and punishing offenders, alternatives to the current system, and cultural aspects of child abuse and the legal response to it. Examines physical abuse and neglect, and focuses on sexual abuse.

Grading Basis: Letter Grade

LAWS 8120 (2-3) Special Topics in Constitutional Law

Offers students the opportunity for in-depth discussion and study on an important topic of constitutional law. Topics may vary from year to year.

Grading Basis: Letter Grade

LAWS 8122 (2) Seminar: Mineral Development

Deals with legal and policy issues surrounding mineral development and its environmental impacts. Emphasizes the problems associated with hard rock minerals and coal development, with some treatment of oil and gas leasing and development issues. Focuses on western public lands with some discussion of international and private lands issues.

Grading Basis: Letter Grade

LAWS 8125 (2) Seminar: Law and the Politics of Family Law

Examines issues that have been raised under the United States Constitution with respect to state regulation of families. Topics include questions of family and individual privacy, the status of children, procreation, marriage and divorce, the definition of family relationships, and problems of federalism and the role of the Supreme Court in the regulation of families.

Grading Basis: Letter Grade

LAWS 8128 (2-3) Jurisprudence

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7128

Grading Basis: Letter Grade

Additional Information: Departmental Category: Legal Theory, Jurisprudence Social Policy

LAWS 8135 (2) Seminar: Gender, Work, and Family

Explores the social and legal problems that develop at the intersection of work and family, and considers legal/non-legal solutions that have been and could be used to accommodate both women and men in their efforts to deal with these problems.

Grading Basis: Letter Grade

LAWS 8138 (2) Seminar: The Rhetoric of Law

Considers how Anglo-American law operates rhetorically, how it persuades, builds character, offers proof, approximates the truth, establishes legitimacy, and makes things happen. It will also explore the ethics of rhetoric and note the relationship of rhetoric to other bodies of legal scholarship (e.g., law and literature, legal pragmatism, law and culture). It will hone student advocacy skills, prepare students to anticipate and defend against the rhetorical stratagems of different legal actors, and enrich students' sense of professional identity.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

LAWS 8154 (2) Seminar: Land Use Planning

Discusses public control of private land uses through planning, zoning, and regulation of land development, including consideration of constitutional and statutory limitations on legislatively created techniques. Offered in alternate years.

Grading Basis: Letter Grade

LAWS 8202 (2) Seminar: Environmental Policy

Examines issues of environmental justice, including the disparate impacts of pollution and land use controls on certain communities and ethnic groups. Topics may include concentration of waste facilities in neighborhoods occupied by poor and minority populations, adequate protection of migrant farmworkers from the impacts of pesticide hazards, and environmental controls that inhibit economic growth and development sought by Indian tribes.

Grading Basis: Letter Grade

LAWS 8205 (3) Seminar: Law and Democratic Governance

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7171

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7325.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8210 (2) Seminar: Comparative Law

Studies discrete topics in Jewish law such as family law, commercial law, criminal law, etc., using the text *Jewish Law: Cases and Materials*, and other sources such as guest lectures. The collection of books that we received from the Touro Law Center will provide a valuable resource for student research.

Grading Basis: Letter Grade

LAWS 8211 (2) Sem: Comp Constitutional Law: US, UK and Australia

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Grading Basis: Letter Grade

LAWS 8212 (2) Seminar: Environmental Law Practice and Policy

Focuses on the translation of environmental policies and purposes into environmental law and practice. Investigates policy issues on prevention of significant deterioration of air quality (PSD), the particulate matter national ambient air quality standard (PM NAAQS), and global climate changes. Emphasizes legal structure issues, including the role of national, state, and local governments in implementing environmental law and policy as well as counterpart global structures and mechanisms for responding to global or transboundary environmental problems.

Requisites: Requires prerequisite course of LAWS 7202 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 8222 (2) Seminar: Environmental Philosophy and Law

Investigates the changing philosophical underpinnings of U.S. environmental law and policy and how philosophy and legal institutions interact.

Grading Basis: Letter Grade

LAWS 8235 (2) Family Law Topics

Explores a variety of current issues related to family law: topics will change to reflect emerging issues and will draw from legal and social science scholarship as well as relevant statutes and cases. Possible topics include reproductive technology, children's rights, the role of religion in family law, and political theories of the family.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8251 (2) Seminar: Advanced Corporate Law

Explores current issues in corporate and securities law, including developments in fiduciary duties of officers and directors, corporate governance, executive compensation, revisions to the model business corporation act, and state and federal litigation reform.

Grading Basis: Letter Grade

LAWS 8285 (2-3) Seminar: Education and the Constitution

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers, and critical thinkers, and provides an opportunity to grow as colleagues and teammates. Requires extra time outside of class.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7055.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8300 (3) Seminar: International Adjudication

Focuses on writing briefs and memoranda of law suitable for practice before tribunals such as the International Courts of Justice. Emphasis will be on students writing, legal analysis, and presentation of oral arguments. Instruction identifies how to research and analyze international materials, such as treaties, covenants, and international customary law.

Grading Basis: Letter Grade

LAWS 8301 (2) Seminar: Innovation, Network Theory, Social Entrepreneurship

Covers topics related to the legal and public policy implications of innovation, entrepreneurship, and social networks including normative ideals of entrepreneurship, the concept of regional advantage, whether startups should be subsidized and the design of such subsidies, the role of universities in commercializing ideas, impact of the tax code on entrepreneurship, the role of corporate responsibility in startups, and more.

Grading Basis: Letter Grade

LAWS 8302 (2) Seminar: Advanced Problems in Water Resources Law

Explores the use of watersheds as geographic and political entities for addressing water-related issues and how laws and institutions facilitate or impede watershed-based problem solving.

Grading Basis: Letter Grade

LAWS 8303 (2) Seminar: Advanced Oil and Gas

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environmental regulation, and the interplay between federal, state and local regulation.

Requisites: Requires prerequisite course of LAWS 7102 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8310 (2) Seminar: International Crimes Punishment

Addresses issues in international criminal law in three parts: 1) basic contents of international law, 2) international criminal tribunals that enforce international criminal law, 3) national efforts to bring international criminal prosecutions.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisites LAWS 6400 and LAWS 7440.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8311 (2) Seminar: Computer Crimes

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront with the recent explosion in computer related crime. Includes Fourth Amendment in cyberspace, law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal and state relations in enforcement of computer crime laws, and civil liberties online.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 8315 (2) Seminar: Advanced Criminal Justice

Studies policy and practice issues rather than case law. Focuses primarily on how American criminal justice is dispensed in cases that do not reach trial, including police behavior, prosecutorial discretion, defense services, bail, plea bargaining, and sentencing.

Grading Basis: Letter Grade

LAWS 8318 (2) Seminar: Law and Economics

Introduces the uses and limitations of microeconomic theory for understanding and resolving legal problems. Emphasizes concepts prominent in the law and economics literature such as cost, transaction costs, utility, and rational self interest.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8320 (2-3) Seminar: Oil and International Relations

Addresses the extent to which the international community of nations is oil dependent. Assesses the impact and the geopolitical dangers to international relations arising from the expanding demand for scarce oil from developing, as well as developed, economies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8321 (2) Seminar: Computers and Law

Explores a range of topics surrounding the juxtaposition of computers and law. Most are aware of the impact that law has on computers through the myriad of regulations that govern computers and related technologies. Less well known is the impact that computer technology is having on governance and on the practice of law. Explores both sides of this dynamic interplay between law impacting computing, and computing impacting law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 8322 (3) Environmental Decision Making

Explores the foundational issues that underlie agency decision making, including environmental ethics, cost benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

Grading Basis: Letter Grade

LAWS 8325 (2) Seminar: Reforming Criminal Trials

Starts from the premise that reform of our criminal trial system to make it less complicated, less expensive, and more reliable should be considered. Examines trial systems in other countries and U.S. changes over recent decades. Student papers make and defend proposals for reform.

Grading Basis: Letter Grade

LAWS 8335 (2) Seminar: Advanced Criminal Procedure

Focuses on a particular topic in criminal procedure. Topics include the privilege against self-incrimination, juries and defense and prosecution ethics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 8341 (3) Seminar: Law and Economics of the Information Age

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "unbundling" policies to advance competition and how intellectual property and antitrust rules should be developed.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5260

Requisites: Requires prerequisite course of LAWS 7201 or LAWS 7241 or LAWS 7301 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 8345 (2) Sem Comp Crim Pro

Grading Basis: Letter Grade

LAWS 8351 (2) Seminar: Law and Economics of Utility Regulation

Discusses economics of regulation and matters ranging from neoclassical economic analysis to public choice theory to new institutional economics. Discusses several regulatory domains, including antitrust law, telecommunications regulation and energy regulation. Highlights both economic and non-economic goals, including universal service, sustainability (e.g., renewable energy) and architecture (e.g., free speech concerns with regard to telecommunications networks).

Requisites: Requires prerequisite course of LAWS 6301 or 7201 or 7241 (minimum grade D-). Restricted to Law (LAWS) or Telecommunications (TELE) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8355 (2) Seminar: Sentencing Law and Policy

Studies sentencing law against the backdrop of criminal justice policy and concerns of public policy. Covers theories of punishment, the merits of indeterminate sentencing, sentencing guidelines, and nonincarcerative sanctions. Confronts problems of race, class, and other disparities in criminal sentencing.

Grading Basis: Letter Grade

LAWS 8361 (2) Seminar: Information Privacy

Explores the laws that regulate the basic technologies of the Internet and the management of information in the digital age. Examines the most significant statutes, regulations and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 8375 (2) Seminar: Advanced Immigration and Citizenship

Explores the law and policy of citizenship in the United States, starting with legal questions regarding acquisition and loss of citizenship as well as the consequences of citizenship, but also examines the fundamental premises underlying American citizenship and the concept of citizenship generally.

Grading Basis: Letter Grade

LAWS 8385 (2) Sem Law & Religion

Grading Basis: Letter Grade

LAWS 8395 (2) Seminar: Separation of Powers

Explores the constitutional relationships among the three branches of the federal government in the sphere of domestic matters, omitting foreign affairs and war. Develops topics including executive orders, Congressional control of the executive and the courts, appointment and removal of officers, impeachment, executive privilege, use of military tribunals, and the election of 2000. A seminar paper will be required.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8400 (2) Special Topics in International Law

Provides in-depth coverage of particular issues in international law and exposes students to intellectual concepts in the field. Students write seminar length papers and develop critical thinking through writing and research.

Grading Basis: Letter Grade

LAWS 8401 (2) Seminar: Securities Litigation and Enforcement

Designed for students interested in studying topics related to securities litigation. Covers civil liability under the Securities Act of 1933, proxy fraud, class actions (with special emphasis on the Private Securities Litigation Reform Act and the Securities Litigation Uniform Standards Act), market manipulation, SEC enforcement actions, enforcement issues involving attorneys and accountants, criminal enforcement, international securities fraud and securities arbitration.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8405 (2) Seminar: Public Health Law and Ethics

Explores rules of law pertaining to the American public health care system and the ethical issues raised by the government's effort to protect the health of the American people. Held at the Anschutz Medical Campus.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8407 (2) Seminar: Tax Policy

Explores current issues in tax policy. Topics may include the tax legislative process, consumption taxes, taxes and distributive justice, the tax exemption for nonprofits, carbon taxes, corporate taxes and integration and taxes and entrepreneurship.

Requisites: Requires prerequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 8409 (2) Seminar Special Problems in Conflict Resolution and Management

Develops a comprehensive description of dispute; creates a conflict assessment of the stakeholders in and dynamics of dispute; assess obstacles to and opportunities for mediation; recommend strategy for addressing and managing the dispute.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 8412 (2) Critical Law and Economics

Explores some of the more successful and enduring critiques of Chicago Law and Economics. Starts with an introduction to economic analysis, including basic analytic tools like rational actor theory, supply and demand, efficiency notions, and cost concepts. Later classes will explore more advanced works in the area.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8415 (2) Seminar: Bioethics and Law

Focuses on legal, moral, and economic analyses of problems posed or soon to be posed by advances in biomedical technologies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8421 (2) Seminar: Duties of the Professional Advisor

Studies ethical and legal regulation of lawyers, auditors, and investment bankers, who have been described as "Gatekeepers" to the investment markets. Considers changes in ethical and legal regulation that can be adopted to restore a sense of integrity for these professionals.

Grading Basis: Letter Grade

LAWS 8425 (2) Seminar: Advanced Torts

Explores how dignitary interests have influenced the development of and have been incorporated into law, using the common law of torts and the constitutional rights of life and liberty as a general (but not exclusive) focal point of discussion.

Grading Basis: Letter Grade

LAWS 8428 (2) Seminar: Women in Law and Literature

Considers both legal and literary depictions of women and their legal and extralegal situations. Topics may include women as mothers, women as sexual beings, women's silence, women's violence and women as criminals, women at work, and women as the "Other" in law and literature.

Grading Basis: Letter Grade

LAWS 8430 (2) Seminar: Comparative Public Health Law and Ethics

Compares public health law systems to those in other countries. Studies the goals, legal structures, and services provided, together with such issues of coercion as quarantines, monitoring, mandates and prohibitions, and forcing pharmaceutical companies to make available inexpensive generic drugs.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8440 (2) Seminar: International Human Rights

Investigates the sources of international human rights law and issues of jurisdiction to prescribe, adjudicate, and enforce norms. Students study treaties and reservations, customary law, declarations, resolutions, and the U.S. courts' and activists' use of materials. Topics include sovereignty and self-determination, culture, privacy, right to equality, language and speech rights, right to development, immigration, workers and globalization, and citizenship.

Grading Basis: Letter Grade

LAWS 8450 (2) Seminar: Law and Economic Development

Explores past and present debates over the role of the legal order in economic development. Studies the relationships among economic ideas, legal ideas and the development policies pursued at the national and international level in successive historical periods, beginning in the Seventeenth Century to the present. Focuses on the potential for an alliance of various traditions from economics, law and other disciplines to understand development.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Comparative Law

LAWS 8455 (2) Gender and Criminal Justice

Explores the intersection of gender and criminal justice in such areas as police and prosecutorial discretion, the investigation and prevention of crimes, the definition of offenses and defenses, factors contributing to criminality, criminal sentencing and the experience of punishment, and the societal ramifications of incarcerating children's caregivers.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8458 (2) Seminar: Law and Literature

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal and a final paper will be required.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 8505 (2) Sem Interdisciplinary Perspectives on Law and Social Change

Introduces legal institutions engaged in social change, from courts, to Congress, to bureaucracies and organizations. Posits tension between tasks of dispute resolution and public policy development and institutional adaptations. Considers the role of public opinion and the classics of legal formalism to more critical accounts. Considers postmodern theory and empirical legal scholarship. Presents alternatives to court-centered approaches to change, including community lawyering and organizing, law and social movements, and legislation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8508 (2) Seminar: Constitutional Foundations Core Ideas

Focuses on core ideas in U.S. constitutional law, such as means/ends analysis, institutional competence, rights definitions, and juridical techniques for limiting governmental powers. Draws from historical writings, contemporary press accounts, learned treatises, oral arguments, law review articles, and key judicial opinions such as *Mccullough v. Maryland*, *Lochner v. New York*, *Brown v. Board of Education*.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8511 (2) Seminar: Wal-Mart

Examines issues raised by Wal-Mart's size, power, and business model. Considered issues bring numerous areas of law into play, including employment and labor law, social welfare legislation, class actions, antitrust, zoning, international labor and human rights regulation, and international trade. The course will show how different areas of the law are integrated in practice.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business and Commercial Law

LAWS 8515 (2) Seminar: Forced Labor

Reviews several regimes of compulsory labor that have been central to the American experience: Black chattel slavery in the antebellum South; debt peonage, criminal surety, and related institutions of agricultural involuntary servitude; convict leasing and other forms of compulsory inmate labor; "White slavery" and prostitution; and forced labor among immigrants. Emphasizes the complicated role that the law has played, and in some respects continues to play, in both supporting and undermining such institutions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8521 (2) Seminar: Comparative Labor Law

Explores the laws and economic transformations that affect labor relations on a global scale.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8531 (2) Seminar: Labor and Employment in Transportation

Explores legal, social, and economic issues arising from labor relations in the industries transporting goods and people by road, rail, air, and water, among the most critical sectors of the economy.

Grading Basis: Letter Grade

LAWS 8533 (2) Seminar: Criminal Law in Context: Legal and Social Images of Victims and Perpetrators

Contextualizes criminal law by engaging in an in depth study of the legal and social characterizations of victims and perpetrators in U.S. law, politics and popular culture.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 8535 (2) Seminar: Class and Law

Explores issues relating social class to such areas as labor relations, law enforcement, controls on radical movements and the distribution of wealth and power. Considers problems defining social class.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8538 (2) Seminar: Modern Legal Theory Core Ideas

Explores key ideas that have shaped American law and legal thought, such as Holmes' bad man, the Coase Theorem, the "Hunch" theory of law, and others. Focuses on researching and writing many short papers.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8545 (2-3) Seminar: Food Law and Policy

Introduces students to the laws and regulations that govern our food supply. The focus is federal law provided by the U.S. Food and Drug Administration, with additional readings, videos and speakers. Topics to be covered include legal definitions for food, rules on food labeling, standards for food safety, biotechnology, international trade, organic and environmental regulation, hunger, farmer's markets and obesity.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8548 (1-2) Seminar: Theory of Punishment

Explores the various justifications that philosophers have developed to explain why we have the right to punish. Examines the historical evolution of our punishment system and focuses on the death penalty as a critical contemporary issue in the debate about the proper role of punishment in our society.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8555 (2) Seminar: Race, Education and American Law

Explores issues of equity, access and reform in American public education, particularly as it pertains to race, including desegregation, diversity, equal protection and public education, tracking and high-stakes testing, courts or the political branches, charters and vouchers.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7525.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8565 (2-3) Citizenship

The concept of citizenship connects immigration with studies of race, international human rights, gender, criminality and many others. It has been receiving growing attention in many scholarly disciplines. Examines the notion of citizenship in recent scholarship spanning law, political science, sociology and history.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8605 (3) Seminar: Regulation and Innovation

Explores two related questions: first, what role does regulation play in encouraging (or inhibiting) innovation? Second, what kinds of innovation approaches to regulation itself are being employed or might be employed and how might these strategies improve the environment for private innovation?

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 8608 (2) Seminar: Power, Ethics, and Professionalism

Examines critically the possibility and character of ethical reasoning within the legal profession in light of its institutional structures. Explores descriptive/normative accounts of the profession's structure, "Professionalism," and individual conscience. Put simply, the seminar explores whether it is possible to be a good lawyer and ethical person.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8611 (2) US National Security and Foreign Relations in a Time of Change

Explores the legal frameworks influencing the development of national security policy and US foreign policy. Students will be introduced to applicable US Foreign Relations Law, US National Security Law and International Law and will engage in analysis about current policy approaches to emergent national security threats.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8613 (2) Seminar: Civil Liberties Litigation

Studies issues unique to the prosecution and defense of civil liberties lawsuits. Discusses litigation strategies with reference to lawsuits currently pending in the federal courts.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public Law

LAWS 8628 (2) Seminar: Law, Power, and Politics

Draws upon various works of political theory, social theory, and jurisprudence to examine different conceptualizations of politics, power, law, and their relations.

Grading Basis: Letter Grade

LAWS 8645 (3) Law and Politics Colloquium: Race in America

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7191

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8648 (2) Seminar: The Law of Politics

Examines the legal framework that governs the political process, including such topics as the political question doctrine, the "Right to vote," the 2000 presidential election controversy, term limits, bicameralism and presentment, campaign finance, direct democracy, and the interpretation of the legislative product (i.e., statutes).

Grading Basis: Letter Grade

LAWS 8650 (3) Conflict of Laws

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Grading Basis: Letter Grade

LAWS 8701 (2) Seminar: Counseling Families in Business

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business and conflict resolution.

Recommended: Prerequisites LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8705 (2) Seminar: Affordable Housing

Explores the policy, legal and practical dynamics that drive the development and preservation of privately owned, government subsidized affordable housing. Investigates the nature of the market for housing, with particular emphasis on multifamily rental housing and debates about market failure in that context and then outline and contrast the major regulatory responses to such market failure. Explores how subsidy programs work in practice, focusing on model documents to frame sample transactions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8718 (2) Seminar: Modern Theorists and Law

Considers the work of Levi-Strauss, Steven Lukes, Pierre Bourdieu, Alfred Schutz, Anthony Giddens, Culler, David Harvey, Denis Cosgrove, Michel Foucault, and Emily Martin with respect to social control and law. Focuses on the way in which social control is exercised through the organization of space, time, and the human body. Topics include consideration of meaning, intersubjectivity in the law, social construction of time, and the body as a real and cultural artifact.

Grading Basis: Letter Grade

LAWS 8722 (2-3) Advanced Energy Law

Provides an opportunity for students to further develop their knowledge of the field and to engage in a substantial writing project. Examples of possible topics include hydraulic fracturing, regulation of air emissions from power plants, the smart grid, transmission siting and development, the ratemaking process, design and regulation of electricity markets, energy finance or comparative study of energy regulation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8725 (2) Seminar: Advanced Topics in American Indian Law

Examines a variety of current issues related to American Indian Law. Topics will change to reflect the subjects that emerge at each time that the seminar is offered. Some examples of topics considered include legal protections for American Indian religion and culture, cultural property, Tribal law, gaming law, and Native American natural and cultural resources law. Department enforced corequisite: LAWS 7725.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8728 (2) Seminar: Critical Theory Colloquium

Surveys critical legal theory; introduces the discipline of analytical engagement with law review literature; feminist legal theory, and critical race theory. Offers a deeper understanding of the purposes behind legal reforms, the interaction between law on the books and law in action, how different groups experience the law in different ways and difficult yet rewarding nature of working through seemingly intractable and emotionally charged race, sex and class issues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8755 (2) Seminar: Higher Education and the Law

Examines the goals, governance, norms, and ideals of American institutions of higher education, and how those policies are shaped by the legal system. Examines the legal relationship between institutions of higher education and its various constituents: faculty, presidents, governing boards, students, alumni, and staff. Spans several traditional doctrinal categories, including contract, torts, employment law, constitutional law, intellectual property, tax, and antitrust.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8765 (2) Seminar: Gender, Law, and Public Policy

Introduces students to various schools of feminist theory and examines the relationship between feminist theories and concrete problems in such areas as constitutional law, education law, employment discrimination, family law and criminal law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8775 (2) Seminar: Advanced Topics in Health Law and Policy

Addresses advanced legal issues in representing physicians, long-term care institutions, hospitals, and other health providers. Issues range from economic policy, distributive justice, and bioethical questions to antitrust and regulatory issues. To be taught at Health Sciences Center.

Recommended: Prerequisite LAWS 7425.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Health Law

LAWS 8785 (2-3) Access to Justice

Explores the scholarship that has developed around the provision of legal services - or the lack of legal services - for those who cannot afford market prices for attorneys. The seminar will also examine recent efforts to provide empirical support for the range of political claims that are made about access to the legal system.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 8808 (2) Rhetoric and the Art of Persuasion

Explores recent work in rhetoric to identify the principles and techniques of effective persuasion in law. Examines the ways in which cognition, language, imagery, metaphor, narrative, and scene setting shape the ways in which lawyers and judges strive to persuade each other.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 9002 (3) Public Land Law

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

Requisites: Requires prerequisite course of LAWS 6112 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9003 (3) Ethical Organizations and Professionals

Provides students, particularly those in the Master of Studies in Law (MSL) in Ethics and Compliance program, the opportunity to examine what drives ethical behavior within organizations and the role that ethics and compliance professionals play in promoting ethical behavior. Investigates ethical challenges and decision making, methods to assess ethical organizational culture and qualities of ethical leadership.

Grading Basis: Letter Grade

LAWS 9005 (3) Introduction to US Law

Provides an overview of the US legal system and will help MSL students begin to 'think like lawyers'. Students will be provided with the necessary vocabulary and skills to use legal resources and legal reasoning in academic and professional environments, including reading and analyzing cases, statutes and regulations, doing legal research, and applying existing law to the issue at hand to predict answers to legal questions.

Requisites: Restricted to Master of Studies in Law (LAWS-MSL) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 9061 (1) Contract Drafting

Begins with value creation by transactional lawyers, and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps and warranties, capitalized terms, definitions, indemnifications and escrow).

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9101 (4) Deals: Engineering Financial Transactions

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9103 (1) Ethics of Patent Practice

Patent agents are not licensed to practice law in any state and therefore courts, clients and practitioners are often faced with uncertainty in defining the ethical obligations of a patent agent and the consequences of failure to fulfill those obligations.

Grading Basis: Letter Grade

LAWS 9104 (3) Wills and Trusts

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 9111 (4) Business Law Colloquium

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9112 (2-3) Advanced Natural Resources Law

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary and scientific materials. Includes field-trip and requires additional field trip expenses.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 6112 or students must have taken or be currently enrolled in any three of the following, LAWS 6002, LAWS 6112, LAWS 6302 or LAWS 7725.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9167 (3) Partnership Taxation

Studies federal income taxation of pass-through entities such as are used by most small businesses in the U.S. Includes creation, operation, distributions, sales of interests and liquidation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 9209 (4) Natural Resources Law Clinic

Engages in litigation and advocacy aimed at protecting the natural resources of the Rocky Mountain region. Students will represent clients in matters involving public lands, wildlife, and other resources. The seminar component will focus on practical aspects of environmental litigation, including administrative practice and decision-making, client representation, citizen suits and ethnical issues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 9226 (1-3) Communications for Compliance Professionals

Develops the tools students will need to thrive in the law school's MSL program. Deepens students' understanding of the United States legal system and develops their ability to communicate effectively and appropriately in writing and orally to their intended audience, and research, organize and explain their ideas clearly, using appropriate writing conventions.

Requisites: Restricted to Master of Studies in Law (LAWS-MSL) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 9341 (3) Law and Economics of the Information Age

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "Unbundling" policies to advance competition, and how intellectual property and antitrust rules should be developed.

Requisites: Requires prerequisite course of LAWS 7201 or 7241 or 7301 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9401 (3) Securities Regulation

Stresses statutory interpretation of the various federal statues regulating the issue of corporate securities and the cases and regulations that have arisen out of those statues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9409 (3) Legal Negotiation

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 9410 (3) International Trade Law

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 9701 (2) Counseling Families in Business

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business, and conflict resolution. Recommended prerequisites: LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9712 (3) Climate Change Law and Policy

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions, and key issues in policy design. Reviews the Supreme Court's April 2, 2007 decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes, and the aftermath in the courts, Executive Branch and Congress.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9722 (3) Energy Law and Regulation

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments, and the key federal statutes and regulatory regimes governing natural gas, electricity, and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail completion.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9735 (3) American Indian Law II

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom and tribal natural resource and environmental management.

Requisites: Requires prerequisite course of LAWS 7725 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9846 (1-2) LLM Seminar

LLM students study academic legal writing in this 1-credit per semester yearlong course. Topics covered will include: the purpose of academic legal writing; how academic legal writing differs from other forms of legal writing; topic selection; legal research (methods and ethics); first drafts; editing; academic workshops; and publishing. In addition, guest speakers will talk to LLM students about career planning and job seeking. International LLM students will learn about the American legal system.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 9856 (1-4) LL.M Thesis

LL.M students are required to write a thesis in order to graduate. Requires significant work of original research on a topic chosen in close consultation with advisors and other law school faculty, and assignments include due dates for topic selection, drafts, and workshop delivery. Thesis is worth two credits. In exceptional circumstances and only after pre-approval, an LL.M student may enroll for a third or fourth credit.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

Law - Master of Studies in Law (MSL)

Colorado Law's Master of Studies in Law (MSL) degree is a one-year, 28-credit, no-LSAT-required program that enables students who hold at least an undergraduate degree to obtain legal training short of a full Juris Doctor (JD). Increasingly, emerging job markets have openings that require some legal knowledge and employers are assigning a number of legal tasks traditionally performed by lawyers to non-lawyers. Colorado Law's MSL will prepare students to obtain and excel in those positions. MSL students will be admitted into one of two specialty tracks: ethics and compliance or patent law.

Ethics and Compliance Curriculum

The ethics and compliance track trains students to become compliance and ethics officers at large corporations, as well as at nonprofit entities, such as colleges, universities, and hospitals. These organizations are subject to an increasing number of legal requirements and need trained professionals to lead effective in-house programs to ensure compliance with statutes and regulations.

This track prepares students to develop, improve, and manage ethics and compliance programs and help organizations obey the law, reduce the risk of fraud, other law-breaking, and misconduct, and mitigate their firms' legal liability and reputation risk. Students have the opportunity to focus on specific fields of law, such as privacy/cybersecurity, healthcare and financial services.

Requirements

MSL students will be admitted into one of two specialty tracks and take courses specifically tailored for that track. The MSL in patent law is designed to train prospective patent agents. The MSL in ethics and compliance is designed to prepare prospective ethics and compliance officers in privacy/cybersecurity, health care and financial services. We anticipate offering additional specialty tracks in other areas in subsequent years.

All MSL students will take two courses designed specifically for MSL students—one that introduces them to the American legal system, and one that introduces them to legal research, writing and analysis. In addition to those introductory courses, MSL students will take required and elective courses, alongside JD students, relevant to their specialty track.

Law - Juris Doctor of Laws (JD)

Colorado Law's three-year, full-time Juris Doctor (JD) degree provides a strong, well-rounded legal education with a rich mixture of theory, policy, doctrinal analysis and professional skills. Students have broad flexibility to meet their individual interests and needs.

Areas of Academic Strength

Environmental, Energy and Natural Resources Law

Ranked consistently among the very best in the country, environmental and natural resources law has been a key focus of the Colorado Law curriculum for more than half a century, and is one of the strongest and deepest programs of its kind.

Technology and Intellectual Property Law

Colorado Law has developed one of the nation's most comprehensive legal programs oriented around information technology. Technology

lawyers address interesting policy challenges and novel legal issues, and rank among the most satisfied within the legal profession. Colorado Law is the right place at the right time for those interested in exploring the frontiers of entrepreneurial law, technology policy and intellectual property.

Entrepreneurial and Business Law

Colorado Law provides a robust curriculum in business law, tailored for aspiring deal lawyers in Boulder, Denver and beyond. Boulder has a vibrant entrepreneurial community with many start-up and emerging companies. We place students in small law firms that serve small business and emerging companies, as well as in larger law firms who serve traditional larger corporate clients. In recent years, we have placed students in interesting and fulfilling in-house positions.

American Indian Law

At Colorado Law, we believe that American Indians deserve the very best lawyers and that we have an obligation to train them. Our American Indian Law Program faculty, including the nation's top scholars and practitioners in the field, offers a full slate of introductory and advanced classes in the field to prepare students for all aspects of Indian law practice, and we now have dozens of successful alumni practicing Indian law in tribal government, federal agencies and at law firms. Colorado Law graduates are equally prepared to work on impact litigation, economic development, policy advocacy, individual legal services and tribal governance in Indian law. Our American Indian Law Program also appeals to many students with broader practice interests in natural resources, public lands, property, museum and art law, technology, entrepreneurship, family law and beyond. Indeed, because American Indian law raises questions regarding the rule of law and legal pluralism, the contours of sovereignty and governance, cross-cultural representation and minority rights and interdisciplinary study and practice, it offers important intellectual development opportunities for all Colorado Law students.

Juvenile and Family Law

Juvenile and family law covers a broad range of practice areas, such as marriage, divorce, custody, visitation, family support, child abuse and neglect, delinquency, adoption, estate planning, education law and elder law. The Juvenile and Family Law Program (JFLP) provides students with opportunities to acquire specialized knowledge in this field, develop a network of, and foster collaboration between, students, academics, and practitioners and engage in interdisciplinary work in the study and practice of the field. The Program includes specialized courses, research projects, externships and clinical opportunities.

Dual Degree Programs

Colorado Law students take advantage of an array of rich opportunities for interdisciplinary study through other CU schools and colleges, in addition to the University of Alberta. The schools work in cooperation to select courses for the programs that allow students to earn the dual degrees in less time than it takes to earn each degree separately. Students apply separately to and are admitted by the two schools under their respective admissions requirements. Only credit hours earned after law school enrollment count toward the JD degree, and the first year of the JD curriculum must be taken exclusively at Colorado Law.

- **Juris Doctor/Master of Business Administration (JD/MBA)** with CU Boulder's Leeds School of Business
- **Juris Doctor/Master in Environmental Studies (JD/ENVS)** with CU Boulder's Environmental Studies Program

- **Juris Doctor/Doctorate in Environmental Studies (JD/PhD)** with CU Boulder's Environmental Studies Program
- **Juris Doctor/Doctor of Medicine (JD/MD)** with CU Denver's School of Medicine on the Anschutz Medical Campus in Aurora
- **Juris Doctor/Master of Public Administration (JD/MPA)** with CU Denver's School of Public Affairs
- **Juris Doctor/Master of Science, Telecommunications (JD/MST)** with CU Boulder's Interdisciplinary Telecommunications Program
- **Juris Doctor/Master of Urban and Regional Planning (JD/MURP)** with CU Boulder's College of Architecture and Planning
- **Juris Doctor/Bachelor of Laws (JD/LLB)** with the University of Alberta Faculty of Law, Canada

Requirements

First Year

First-year courses lay the foundation and all JD candidates take these courses to learn to "think like a lawyer." Common law courses taught in the Socratic Method allow students to develop legal reasoning and critical thinking skills. All first-year students are assigned to a small cohort to help build strong relationships and study groups with classmates.

Fall Semester

- **Civil Procedure:** Rules governing pleading, joinder of parties, discovery, jurisdiction of courts, right to jury trial, appeals and res judicata and collateral estoppel, with emphasis on the Federal and State Rules of Civil Procedure.
- **Contracts:** Contract liability, offer and acceptance, consideration, frauds statute, contract remedies, the parol evidence rule, contract performance, conditions, changed circumstances.
- **Legal Writing:** Legal analysis and document preparation, objective legal analysis techniques, legal rule synthesis, authority use to explain rules and rule application to case facts.
- **Legislation and Regulation:** Statutory interpretation, architecture of the administrative state and interpretation and review of regulation.
- **Torts:** Nonconsensual allocation of losses for civil wrongs, focusing on negligence and strict liability.

Spring Semester

- **Legal Writing II:** Appellate brief and document preparation, oral arguments before a three-judge mock court, techniques of persuading a court to accept a client's view of the law and facts, professional judgments within ethical boundaries and lawyer credibility.
- **Constitutional Law:** Constitutional structure, including judicial review, federalism, separation of powers and constitutional rights of due process and equal protection.
- **Criminal Law:** Statutory and common law of crimes and defenses, the procedures by which the law makes judgments as to criminality of conduct, constitutional limits.
- **Property:** Personal property, estates and interests in land, landlord-tenant, basic land conveyancing and private land use controls.
- **Academic Support**

Second and Third Years

The elective program in the second and third years builds upon the foundation laid in the first-year curriculum. Students must take Evidence and Legal Ethics and Professionalism courses and a seminar course. Colorado Law encourages a balance between experiential learning and

classroom studies, graded courses and non-graded courses and study within and outside the law school.

Experiential Learning

Students who start law school in the fall 2016 semester or later will also have to complete six credit hours of experiential courses. Experiential courses are simulation courses, law clinics, and externships. At least two of these credits must be obtained in courses with regularly scheduled class sessions as specified in Miscellaneous Rule 36(A). Externships do not qualify as courses with regularly scheduled class sessions, and Law School Rules generally cap credits that may be earned in externships at 4 credits. The registrar's office will post which courses in a given semester meet the definition of simulation courses before registration begins for that semester.

No student shall receive more than 14 credit hours toward the JD degree from cocurricular activities such as journals, moot court, and trial competitions; Independent Legal Research; courtroom observation courses; externships; or course work completed in another department, school or college of the university or at another institution of higher learning.

Elective Courses

Business

- Accounting Issues for Lawyers
- Advanced Contracts: Commercial Transactions
- Agency, Partnership and the LLC
- Antitrust
- Auditing, Compliance and Management
- Bankruptcy
- Business Planning
- Business Transactions
- Corporate Finance
- Corporations
- Creditors' Remedies and Debtors' Protection
- Deals
- Deals Lab: Advanced Securities
- Deals Lab: Advanced Venture Capital
- Law Practice Management
- Mergers, Acquisitions and Reorganizations
- Payment Systems
- Secured Transactions
- Securities Regulation
- Venture Capital and Private Equity

Criminal

- Capital Punishment in America
- Criminal Procedure: Investigative Phase
- Criminal Procedure: Adjudicative Process
- Post Conviction Criminal Procedure
- White Collar Crime

Family, Gender and Health

- Domestic Violence
- Family Law
- Gender, Law, and Public Policy
- Health Law I: Finance, Administration and Organization of Health Care
- Health Law II: Medical Malpractice Litigation

- Juvenile Justice
- Parent, Child and State
- Sexuality and the Law

Government and Public Interest

- Administrative Law
- Education Law
- Election Law
- Employment Discrimination
- Employment Law
- Federal Courts
- First Amendment
- Labor Law
- Legislation
- Local Government
- Race and American Law

Intellectual Property, Technology and Telecommunications

- Computer Crimes
- Copyright
- Introduction to Intellectual Property Law
- IP Counseling
- IP and Technology Contracting
- Patent Law
- Patent Litigation
- Privacy and Security in the Digital Age
- Telecommunications Law and Policy
- Trademark and Unfair Competition

International

- Conflict of Laws
- Law and Development
- Immigration and Citizenship Law
- International Business Transactions
- International Dispute Resolution
- International Environmental Law
- International Human Rights
- International Law
- International Legal Order: History and Foundations
- International Trade Law
- Refugee and Asylum Law

Jurisprudence and Perspective

- Class and Law
- Critical Theory Colloquium
- Economic Analysis of Law
- Gender and Law
- Jurisprudence
- Philosophy of Law

Litigation

- Advanced Appellate Advocacy
- Advanced Evidence
- Complex Civil Litigation
- Evidence
- Federal Litigation: Everything but the Trial

- Litigation Drafting
- Motions Advocacy
- Trial Advocacy

Natural Resources, Energy and Environmental Law

- American Indian Law I
- American Indian Law II
- Climate Change Law and Policy
- Energy Insecurity and Sustainable Law
- Energy Law and Regulation
- Environmental Law
- Foundations of Natural Resources Law and Policy
- Jurisdiction in Indian Country
- Mining and Energy Law
- Oil and Gas
- Public Land Law
- Toxic and Hazardous Waste
- Water Law
- Wildlife and the Law

Practice—Clinical

- American Indian Law Clinic
- Appellate Advocacy Clinic
- Civil Practice Clinic
- Criminal Defense Clinic
- Entrepreneurial Law Clinic
- Extern Program
- Family Law Clinic
- Juvenile Law Clinic
- Natural Resources Litigation Clinic
- Technology Law and Policy Clinic

Practice—Simulation

- Advanced Trial Advocacy
- Alternative Dispute Resolution
- Appellate Advocacy Competition
- Arbitration
- Legal Negotiation
- Mediation
- Motions Advocacy
- Trial Advocacy
- Trial Competition

Property

- Advanced Real Estate Transactions
- Construction Law
- Estate Planning
- Land Use Planning
- Real Estate Planning
- Real Estate Transactions
- Wills and Trusts

Research and Writing

- Advanced Legal Research
- Advanced Legal Writing

- Independent Legal Research: *Journal of International Environmental Law and Policy*
- Independent Legal Research: *Journal on Telecommunications & High Technology Law*
- Independent Legal Research: Law Review
- Judicial Opinion Writing

Taxation

- Corporate Taxation
- Estate Planning
- Federal Estate and Gift Tax
- Federal Tax Politics
- Income Taxation
- Partnership Tax
- Tax Policy
- Taxation of Conduit Entities

Seminars

- Advanced American Indian Law
- Advanced Criminal Procedure
- Advanced Natural Resources Law
- Antidiscrimination and First Amendment
- Class and Law
- Comparative Constitutional Law
- Computers and the Law
- Constitutional Theory
- Consumer Empowerment
- Counseling Families in Business
- Gender Law
- Information Privacy
- Jurisprudence
- Law and Economics of Utility Regulation
- Law and Literature
- Media, Popular Culture and Law
- Oil and International Relations
- Power, Ethics and Professionalism
- Securities Litigation and Enforcement
- Separation of Powers
- Tax Policy
- Theory of Punishment

Note: Not all courses are offered each semester. This is a composite list of the last three years of course offerings.

American Indian Law - Graduate Certificate

Colorado Law offers an American Indian law certificate demonstrating the completion of a concentrated course of study in the legal issues facing Native peoples and American Indian tribes. This certificate is attractive to legal, tribal and governmental employers, as well as employers seeking to do business with tribes and tribal members.

Requirements

Registration

To register for the American Indian law certificate, please complete the following steps:

1. Consult with the Director of the American Indian Law Program (Professor Carla Fredericks) about your planned selection of courses.
2. Complete the registration form (https://cuboulder.qualtrics.com/SE/?SID=SV_eWlrnYp0baHDCf3) when registering for your second year of law school. Please indicate the classes you plan to take for the certificate. You are not bound to the plan you submit, and there is no penalty (other than not receiving the certificate) for failing to complete the program.
Note: We strongly encourage submitting this form when you register for your second year. It helps both you and us to plan for your successful completion of the program. However, you can still receive the certificate if you submit this form late but complete the required coursework.
3. By March 15 (or Nov. 1) of the graduation semester, the student confirms that they will earn the certificate by resubmitting the form with updated information.

Program Requirements

Students must complete at least 92 credit hours (89 is required for the JD), at least 18 of which are in designated Indian law and related courses.

Visit the Rules of the Law School (<http://www.colorado.edu/law/about/rules>) webpage for complete details.

Required Courses and Semester Credit Hours

Course Requirements

Required courses after the first year (14 credits):

LAWS 7725	American Indian Law I	3
LAWS 7735	American Indian Law II	3
LAWS 7309	American Indian Law Clinic	2-4

Electives

Remaining (4) credits may be earned from the following: 4

American Indian Law Curriculum

LAWS 8725	Seminar: Advanced Topics in American Indian Law
LAWS 6602	Cultural Property Law
LAWS 8725	Seminar: Advanced Topics in American Indian Law
LAWS 7745	Jurisdiction in Indian Country

Native American Law Students Association Moot Court Competition

LAWS 7846	Independent Legal Research (on an American Indian law topic upon approval of the AILP Director)
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Externship with an American Indian law focus (upon approval of the AILP Director)

Any course from the University of Colorado's Native American Indigenous Studies (NAIS) graduate certificate (upon approval of the AILP Director)

American Indian law course at another law school on a topic not regularly offered at Colorado Law (upon the approval of the AILP Director)

Environment and Natural Resources Law Curriculum

LAWS 6112	Foundations of American Natural Resources Law
LAWS 7202	Environmental Law

LAWS 6302	Water Resources
LAWS 6002	Public Land Law
LAWS 8112	Seminar: Advanced Natural Resources Law
LAWS 7232	Global Energy Justice
LAWS 6712	Climate Change Law and Policy
LAWS 6702	Climate Justice
LAWS 7122	Mining and Mineral Development Law
LAWS 7102	Oil and Gas
LAWS 8320	Seminar: Oil and International Relations
LAWS 6722	Energy Law and Regulation
LAWS 6732	Renewable Energy Project Finance and Development

Government and Public Law Curriculum

LAWS 7205	Administrative Law
LAWS 7003	Federal Courts
LAWS 7025	Civil Rights

Litigation, Negotiation and Alternative Dispute Resolution Curriculum

LAWS 6353	Evidence
LAWS 6109	Trial Advocacy
LAWS 6373	Federal Litigation: Everything but the Trial
LAWS 7409	Legal Negotiation

Business & Commercial Law Curriculum

LAWS 6201	Agency, Partnership, and the LLC
LAWS 6211	Corporations
LAWS 6007	Income Taxation
LAWS 7629	Introduction to the In-House Practice of Law

International and Comparative Law Curriculum

LAWS 6400	International Law
LAWS 7440	International Human Rights and Humanitarian Law
LAWS 6122	International Natural Resources Law and Policy

Labor & Employment Curriculum

LAWS 6521	Employment Law
LAWS 6511	Labor Law
LAWS 7541	Employment Discrimination

Property, Trusts and Estates & Land Use Curriculum

LAWS 6004	Real Estate Transactions
LAWS 6104	Wills and Trusts
LAWS 7217	Estate Planning
LAWS 7154	Land Use Planning

Family & Juvenile Justice Curriculum

LAWS 7105	Family Law
LAWS 7115	Juvenile Justice
LAWS 7513	Domestic Violence
LAWS 7135	Parent, Child, and State

Legal Theory, Jurisprudence and Social Policy Curriculum

LAWS 7128	Jurisprudence
LAWS 8608	Seminar: Power, Ethics, and Professionalism
LAWS 7525	Race and American Law
LAWS 7085	Law and Religion
LAWS 8450	Seminar: Law and Economic Development

Research & Writing Curriculum

LAWS 6856	Advanced Legal Research
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LAWS 7051	Transactional Drafting	
LAWS 6207	Writing in the Regulatory State	
Intellectual Property, Technology and Telecommunications Curriculum		
LAWS 6301	Introduction to Intellectual Property	
<i>Other</i>		
Other classes that may be approved by the AILP Directors and the Associate Dean for Academic Affairs.		
Total Credit Hours		12-14

Entrepreneurial Law - Graduate Certificate

The entrepreneurial law certificate coordinates Colorado Law's strengths and business-law related assets in the areas of entrepreneurial and technology law, such as the Silicon Flatirons Center (<http://www.siliconflatirons.com>), the Entrepreneurial Law Clinic (<https://www.colorado.edu/law/academics/clinics/entrepreneurial-law-clinic>) and the *Journal on Telecommunications & High Technology Law*. It is awarded to law students who complete course work reflecting a concentrated study of issues typically faced by transaction-side lawyers, and signals to prospective employers that a student possesses a skill set with applicability across issues of transactional law.

Requirements

Certificate requirements include:

1. at least 92 credit hours (89 is required for the J.D.), and
2. at least 21 of the 92 credit hours in the area of entrepreneurial law.

Visit the Rules of the Law School (<https://www.colorado.edu/law/about/rules>) webpage for complete details.

Required Courses and Semester Credit Hours

Required Courses

One of the following:		3
LAWS 6211	Corporations	
LAWS 6201	Agency, Partnership, and the LLC	
One of the following:		3
LAWS 7271	Venture Capital and Private Equity	
LAWS 7101	Deals: Engineering Financial Transactions	
One of the following:		3
LAWS 7619	Entrepreneurial Law Clinic	
LAWS 7939	Extern Program	
<i>One CU Leeds School of Business course: Entrepreneurship and Small Business Management, Business Planning</i>		3
ESBM 4570	Entrepreneurial Finance	
ESBM 4830	Entrepreneurship Business Planning and Preparation	
One of the following:		3
LAWS 7311	Patent Law	
LAWS 7341	Trademark and Unfair Competition Law	
LAWS 7301	Copyright	
LAWS 6301	Introduction to Intellectual Property	
One of the following:		
LAWS 6157	Corporate Taxation	

LAWS 6007	Income Taxation	
LAWS 6117	Survey of Business Enterprise Tax	
CANNOT FIND (Taxation of Conduit Entities)		
Two or more of the following:		6
LAWS 6271	Special Topics: Deals Lab	
LAWS 6123	Legislative and Policy Drafting	
LAWS 7409	Legal Negotiation	
LAWS 7709	Advanced Legal Negotiation	
Total Credit Hours		21

Health Law and Policy - Graduate Certificate

Law students may demonstrate to employers that they are prepared to practice health law and lead in the administration financing, organization policy-making and delivery of health care by earning a health law & policy certificate (HLP). To qualify for the HLP certificate, a student must earn 92 credit hours—three more than required for a regular JD degree—and at least 20 credit hours must be earned in courses approved in the health law and policy curriculum. Students awarded the health law & policy certificate will carry the notation of their concentration on their Law School transcripts. Moreover, students may earn the "Certificate With Honors" notation by earning a cumulative average grade of at least A- in the designated courses.

The HLP certificate will not only prepare you to practice law in areas such as health care administration, organization, financing, public interest advocacy and public health, but the certificate will also allow you to take advantage of the wealth of resources and courses related to health and health care in the Law School and throughout the University of Colorado system. We surveyed health law employers and heard from them that the HLP certificate will move law graduate resumes to the top of the applicant pile.

For more information, contact the temporary Health Law Program Director, Deborah Cantrell (deborah.cantrell@colorado.edu).

Requirements

A full list of the designated courses and HLP certificate requirements may be found under Law School Rule 53 (https://www.colorado.edu/law/about/rules/#_Toc385575490).

Required Courses and Semester Credit Hours

Health Law Core Course Offerings

LAWS 7425	Health Law and Policy: Access, Cost, Quality, Choice	2-3
LAWS 7405	Health Law 2: Medical Malpractice and Quality Regulation	2-3
LAWS 7205	Administrative Law	3
Advanced Health Law Electives		
LAWS 7415	Bioethics and Law	2
LAWS 8430	Seminar: Comparative Public Health Law and Ethics	2
LAWS 7555	Poverty, Health, and Law Practicum	4
LAWS 7565	Corporate Transactions in Health Law	3
Total Credit Hours		18-20

Experiential Learning and Externship Opportunities

Colorado law students have enjoyed the network and mentoring provided by the area's health law community that has taken an active interest in enhancing our students' educational experience.

- Boulder Community Hospital General Council Office
- Longmont United Hospital General Council Office
- Colorado Department of Public Health and The Environment
- U.S. Department of Health and Human Services, Office of Civil Rights
- And a host of private law firms such as Caplan & Earnest, Holland & Hart, Feagre & Benson, and Polshinelli Shughart

Juvenile and Family Law - Graduate Certificate

Juvenile and family law covers a broad range of practice areas, such as marriage, divorce, custody, visitation, family support, child abuse and neglect, delinquency, adoption, estate planning, education law and elder law. The juvenile and family law program (JFLP) provides students with opportunities to acquire specialized knowledge in this field, develop a network of, and foster collaboration between students, academics and practitioners, and engage in interdisciplinary work in the study and practice of the field. The program includes specialized courses, research projects, externships and clinical opportunities.

Requirements

Colorado Law offers a juvenile and family law certificate, demonstrating a student's completion of a concentrated course of study in juvenile and family law.

Students must earn 92 total credits, which must include 18 in the field of juvenile and family law.

A student who satisfies all of the course requirements for the certificate will be awarded the certificate if the student earned at least a C in each course designated by the student as satisfying the certificate requirements. A student who satisfies all of the course requirements for the certificate would be awarded the certificate "with honors" if the student earned a cumulative grade point average of at least an A- in courses designated by the student as satisfying the certificate requirements.

Visit Rules of the Law School (<http://www.colorado.edu/law/about/rules>) (Misc. Rule 51) for complete details. Interested students should submit a completed Certificate Application (https://cuboulder.qualtrics.com/SE/?SID=SV_a5IGEoglyAxINyZ).

Required Courses and Semester Credit Hours

Required Courses

LAWS 7105	Family Law	3
At least one of:		3
LAWS 7115	Juvenile Justice	
LAWS 7513	Domestic Violence	
LAWS 7135	Parent, Child, and State	
One clinic:		3
LAWS 6099	Family Law Clinic	
LAWS 7449	Juvenile and Family Law Clinic	
Other clinic focusing on juvenile or family issues (approved by the Program Directors)		

Electives		9
LAWS 6281	Accounting Issues for Lawyers	
LAWS 7429	Alternative Dispute Resolution	
LAWS 7021	Bankruptcy	
LAWS 8115	Seminar: Child Abuse and the Law	
LAWS 7145	Comparative Family Law	
LAWS 8701	Seminar: Counseling Families in Business	
LAWS 7055	Education Law	
LAWS 6525	Elder Law	
LAWS 7217	Estate Planning	
LAWS 8440	Seminar: International Human Rights	
LAWS 9409	Legal Negotiation	
LAWS 7439	Mediation	
LAWS 7535	Poverty, Health and Law 1	
LAWS 7515	Poverty Law	
LAWS 7505	Sexuality and the Law	
LAWS 8235	Family Law Topics	
LAWS 9104	Wills and Trusts	
Other courses approved by JFLP Directors		
Total Credit Hours		18

Natural Resources Law and Policy - Graduate Certificate

The University of Colorado Law School has a proud tradition as a leader in the field of natural resources law, and it consistently ranks among the best programs in that field. The Energy, Environmental, and Natural Resources Law and Policy Certificate recognizes the strength of the law school's natural resources program by affording law students the opportunity to design an educational program that provides a solid foundation in natural resources law, even while ensuring that they receive a well-rounded legal education. The certificate also offers prospective employers evidence of a student's interest and commitment to the study of natural resources law.

Requirements

At least 92 total credit hours in law school courses or in graduate-level courses approved for the certificate program by the Dean's Office, in consultation with the Director of the Natural Resources Law Center.

At least 18 credit hours in natural resources law and policy courses, in addition to administrative law, as set forth below.

Required Courses and Semester Credit Hours

Required Courses

LAWS 7205	Administrative Law	3
LAWS 9112	Advanced Natural Resources Law (or any other natural resources law-related seminar approved by the Program Advisor for the Natural Resources Law and Policy Certificate)	2-3

Electives

At least three of the following courses:		9
LAWS 7202	Environmental Law	
LAWS 6112	Foundations of American Natural Resources Law	
LAWS 6722	Energy Law and Regulation	

LAWS 6002	Public Land Law	
LAWS 7312	Advanced Water Law	
LAWS 7222	Environmental Decision-Making	
At least two of the following courses:		6
LAWS 6712	Climate Change Law and Policy	
LAWS 7122	Mining and Mineral Development Law	
LAWS 7132	Energy, Insecurity, Sustainable Law	
LAWS 8320	Seminar: Oil and International Relations	
LAWS 7102	Oil and Gas	
LAWS 7212	Environmental Litigation	
LAWS 6510	International Environmental Law	
LAWS 7402	The Law of Toxic and Hazardous Wastes	
LAWS 6502	Wildlife and the Law	
LAWS 7154	Land Use Planning	
LAWS 7209	Natural Resources and Environmental Law Clinic	
LAWS 7916	Journal: CO Natural Resources, Energy & Environmental Law Review	
LAWS 7939	Extern Program (externship with Natural Resources law focus)	
LAWS 7512	Advanced Environmental Law: Air Pollution	
Any natural resources-related course whether at the law school or in a non-law department graduate level course approved by the Dean's Office or law school credit and approved for the certificate program by the Natural Resources Law and Policy Certificate Advisor.		

Total Credit Hours 20-21

Tax Emphasis - Graduate Certificate

The Law School offers a program of law study that leads to a Juris Doctor degree with an emphasis in taxation. The program signifies tax law experience beyond that normally obtained by law graduates, but not as extensive as that obtained in a master's of taxation degree program.

Requirements

Students must earn at least 92 credit hours (89 are required for the JD) with at least 18 of the credits in taxation.

Business school and economics department courses taken for Law School credit under the tax emphasis program are limited to 6 semester credit hours and must have received prior approval from the faculty. Students may take more than the required 18 credit hours of tax courses.

Students must receive at least a B in the business school course or in the public finance course to count for Law School credit. The business school or public finance courses will be treated as pass/fail courses for the Law School transcript; that is, these courses will count toward the 92 hours required for the degree, but will not be taken into account in computing a law student's grade point average.

Required Courses and Semester Credit Hours

Required Courses		
LAWS 6007	Income Taxation	4
LAWS 6167	Partnership Taxation	3
LAWS 7207	Federal Estate and Gift Tax	3
Electives		8
At least one tax planning course:		

LAWS 7211	Business Planning	
	or LAWS 7024 Real Estate Planning	
LAWS 8407	Seminar: Tax Policy ¹	
Additional elective credits to make up the 18 hours from tax courses (at the Law School) or from graduate tax offerings (at the Leeds School of Business) approved for law credit.		
Total Credit Hours		18

¹ If LAWS 8407 is not offered, students can opt to take Tax Policy (at the Leeds School of Business) or Public Finance (in the Department of Economics).

Graduating in Three Years

Students can complete the program within the normal three-year law degree period by planning the program of law study effectively and taking a summer session or a heavier-than-average load each semester after the first year. Law students who wish to participate to participate in the program should submit enrollment forms to both the program director and the law school registrar.

PROGRAMS A-Z

No results found, please try again.

- Accounting - Master of Science (MS)Image of Enrollment_Stock84GA
- Actuarial Studies and Quantitative Finance - CertificatImage of Actuarial Studies
- Aerospace Engineering Science - Bachelor of Science (BS)Image of ASE
- Aerospace Engineering Sciences - Doctor of Philosophy (PhD)Image of ASE
- Aerospace Engineering Sciences - Master of Science (MS)Image of ASE
- Aerospace Engineering Sciences - Professional Master of Science (MSAES)Image of ASE
- American Indian Law - Graduate CertificatImage of American Indian Law
- Anthropology - Bachelor of Arts (BA)Image of ANTH
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- Applied Shakespeare - Graduate CertificatImage of TheatreDance
- Arabic - MinorImage of MEIS Certificate, Arabic Minor
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- Electrical Renewable Energy Systems - MinorImage of ElectricalEngineeringMilos_Popovic2GA
- Electrical and Computer Engineering - Bachelor of Science (BS)Image of ElectricalEngineeringMilos_Popovic2GA
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- Emergent Technologies and Media Art Practices - Doctor of Philosophy (PhD)Image of Enrollment_Stock39GA
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COURSES A-Z

About the Course Descriptions

The courses listed here are included in the Boulder campus catalog during the 2017–18 academic year. This listing does not constitute a guarantee that any particular course will be offered during this year. Consult specific programs and major requirements within each school and college for more information. Also see the online Guest Course Search (<http://www.colorado.edu/academics/course-search>) for details about specific class offerings and schedules.

Course Numbering

Consult specific departments and programs within schools and colleges for restrictions, requirements and permissions. (<http://www.colorado.edu/catalog/node/448>)

- **1000–2000 courses** are usually intended for lower-division students (freshmen and sophomores).
- **3000–4000 courses** are intended for upper-division students (juniors and seniors), and may require instructor consent.
- **5000 courses** usually require graduate-student status, but may be open to qualified undergraduates with instructor consent. Consult the program or department.
- **6000, 7000 and 8000 courses** are usually open only to graduate students.

Abbreviations

Coreq.	Corequisite
Lab.	Laboratory
Lect.	Lecture
Prereq.	Prerequisite
Rec.	Recitation
CE/SL	Civic engagement/service learning component

Course Credits

Course credits are stated in semester units.

Accounting (ACCT)

Courses

ACCT 3220 (3) Corporate Financial Reporting 1

First of a two-course sequence intended to provide students with increased fluency in the language of business. Focuses on U.S. and international accounting concepts and methods that underlie financial statements and the related implications for interpreting financial accounting information.

Requisites: Requires prerequisite courses of BCOR 2000 and BCOR 2200 or BCOR 2002 and BASE 2104 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ACCT 3225 (6) Corporate Financial Reporting

Intended to provide students with increased fluency in the language of business. Focuses on U.S. and international accounting concepts and methods that underlie financial statements and the related implications for interpreting financial accounting information. Builds and extends detailed knowledge of preparation, analysis, and use of financial statements. No credit granted for this course and ACCT 3220 and ACCT 3230.

Requisites: Requires prerequisite courses of BCOR 2000 and BCOR 2200 or BCOR 2002 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ACCT 3230 (3) Corporate Financial Reporting 2

Second in a two-course sequence building and extending detailed knowledge of preparation, analysis and use of financial statements.

Requisites: Requires a prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ACCT 3320 (3) Cost Management

Provides cost analysis for the support of management decision making. Analyzes activities, cost behavior, role of accounting in planning, financial modeling, and managerial uses of cost data.

Requisites: Requires prerequisite courses of BCOR 2000 and BCOR 2200 or BCOR 2002 and BASE 2104 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ACCT 3440 (3) Income Taxation of Individuals

Examines concepts and structure of the United States income tax system. Focuses on concepts affecting all taxpayers, with emphasis on individual taxation.

Requisites: Requires prerequisite courses of BCOR 2000 and BCOR 2200 or BCOR 2002 and BASE 2104 (all minimum grade D-). Restricted to Accounting (ACCT) or Finance (FNCE) majors with 52-180 units completed.

ACCT 3700 (3) Accounting in a Global Economy

This London-based global seminar introduces undergraduate students to transfer pricing, International Financial Reporting Standards (IFRS) and the impact of foreign exchange rates on financial reporting. Includes an IASB headquarter experience and presentations from multinational corporations and public accounting firms. It also includes experiential-based accounting learning in continental Europe.

Requisites: Requires a prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Business (BUSN) majors only.

ACCT 4240 (3) Advanced Financial Accounting

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5240

Requisites: Requires prerequisite course of ACCT 3220 and ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) or Finance (FNCE) majors with 52-180 units completed.

ACCT 4250 (3) Financial Statement Analysis

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5250

Requisites: Requires a prerequisite course of ACCT 3220 or 3225 (minimum grade D-). Restricted to Accounting (ACCT), Finance (FNCE) or Accounting Concurrent Degree majors only with 52-180 units completed.

ACCT 4330 (3) Advanced Cost Management

Critically analyzes advanced topics in cost management. Uses cases and current readings.

Requisites: Requires prerequisite courses of ACCT 3220 and ACCT 3230 and ACCT 3225 (all minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

ACCT 4540 (3) Accounting Information Systems

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5540

Requisites: Requires a prerequisite course of ACCT 3220 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) majors with 52-180 units completed.

ACCT 4620 (3) Auditing and Assurance Services

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5620

Requisites: Requires a prerequisite course of ACCT 3230 (minimum grade D-). Restricted to Accounting (ACCT) majors 52-180 units completed.

ACCT 4800 (3) Accounting for Government and Nonprofit Organizations

Reporting, planning and control of government and nonprofit organizations. Includes program budgets, responsibility accounting and fund accounting.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5800

Requisites: Requires prerequisite course of ACCT 3220 and ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) or Finance (FNCE) majors with 52-180 units completed.

ACCT 4820 (3) Topics in Business

Offered irregularly to provide opportunity for investigation of new frontiers in accounting.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5820

Requisites: Requires a prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Accounting (ACCT) majors 52-180 units completed.

ACCT 4821 (3) Experimental Seminar: Financial Report for Complex Transactions

Focuses on topics related to major financial events in the life of an organization (IPOs, mergers and acquisitions). Enhance the ability to understand the economic essence of important complex business transactions as linked to the financial reporting and tax issues surrounding these deals. Many fascinating and recent transactions will be examined in depth.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5821

Requisites: Requires a prerequisite course of ACCT 3230 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ACCT 4827 (3) Integrated Reporting for Socially Responsible Strategies

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 5827 and CESR 4827

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business majors, 52-180 units completed.

ACCT 4850 (3) Senior Seminar - Accounting Ethics

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets.

Requisites: Requires prerequisite course of ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Accounting (ACCT) majors with 102-180 units completed.

ACCT 4900 (1-3) Independent Study

Requires prior consent of dean and instructor under whose direction study is taken. Intended only for exceptionally well-qualified business seniors. Departmental form required.

ACCT 5240 (3) Advanced Financial Accounting

Examines advanced financial accounting theory and practice, emphasizing U.S. and international accounting for business combinations, consolidated financial statements, and accounting for partnerships.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4240

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

ACCT 5250 (3) Financial Statement Analysis

Focuses on the use of U.S. and international accounting information by decision-makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers, and auditors. Emphasizes equity valuation and risk analysis.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4250

Requisites: Requires prerequisite course of ACCT 3220 or ACCT 3225 (min grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5330 (3) Advanced Cost Management

Critically analyzes advanced topics in cost management. Uses cases and current readings.

Requisites: Requires prerequisite course of ACCT 3320 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5410 (3) Income Tax Accounting**ACCT 5450 (3) Income Taxation of Business Entities**

Examines the income tax consequences of business entities. Focuses on regular corporations, partnerships, limited liability companies and S corporations.

Requisites: Restricted to C-FNCEACCT or C-FNCEACTX or C-ACCT or C-ACCTACTX or BUAD graduate students only.

Recommended: Prerequisite ACCT 3230.

ACCT 5540 (3) Accounting Information Systems

Considers the interaction of accountants with information systems and the role of accounting information systems in business processes. Focuses on the tools used by accountants and provides an understanding of accounting as an information system.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4540

Requisites: Requires prerequisite course of ACCT 3220 or 3225 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5620 (3) Auditing and Assurance Services

Emphasizes the value of assurance services, including the market for financial-statement audits, and the audit decision process, from obtaining a client through planning and testing, to issuance of the audit report. Focuses on making judgments and decisions under conditions of uncertainty and continually evaluating the substance of business transactions over their form.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4620

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

ACCT 5700 (3) International Accounting

Intensive focus on international financial statement analysis, cultural and economic differences that affect financial reporting in various countries. Examples include international financial reporting standards and accounting for foreign currency transactions.

Requisites: Requires prerequisite course of ACCT 3230 or ACCT 3225 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5800 (3) Accounting for Government and Nonprofit Organizations

Reporting, planning and control of government and nonprofit organizations. Includes program budgets, responsibility accounting and fund accounting.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4800

Requisites: Requires prerequisite course of ACCT 3220 (minimum grade D-). Restricted to Acct (ACCT), Accounting Taxation (ACTX) or Business Administration (BUAD) graduate students or Finance/Acct (FNCEACCT) or ACCT Concurrent Degree students only.

ACCT 5820 (3) Topics in Business

Offered irregularly to provide opportunity for investigation of new frontiers in accounting.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4820

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

ACCT 5821 (3) Experimental Seminar: Financial Report for Complex Transactions

Focuses on topics related to major financial events in the life of an organization (IPOs, mergers and acquisitions). Enhance the ability to understand the economic essence of important complex business transactions as linked to the financial reporting and tax issues surrounding these deals. Many fascinating and recent transactions will be examined in depth.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4821

Requisites: Requires a prerequisite course of ACCT 3230 (minimum grade D-). Restricted to ACCT or ACTX or BUAD or FNCEACCT or ACCTACTX students only.

ACCT 5827 (3) Integrated Reporting for Socially Responsible Strategies

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4827 and CESR 4827

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 5828 (3) Experimental Seminar: AIS Audit

Accounting Information Systems are pervasive in every organization, large or small, creating new risks for these organizations and their auditors. Teaches auditors techniques for understanding how these systems work, how the business uses them to improve business performance and how they impact the audit.

ACCT 5830 (3) Experimental Seminar: Recent Developments in Financial Reporting

Focuses on emerging financial reporting issues in the United States and Internationally.

Requisites: Requires prerequisite course of ACCT 3230 (min grade D-). Restricted to Accounting, Finance/Accounting, Info Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Admin (BUAD) grad students only

ACCT 6000 (1-4) Academic Internship in Accounting

Offers students the opportunity to gain professional work experience in an accounting or tax position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes lectures and a course paper. Students may not preregister for this course, and they must contact the Director of the concurrent degree program in accounting for approval. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-). Requires at least 90 credit hours of coursework. A minimum GPA of 3.00 is required. Restricted ACCT, ACTX or BUAD graduate students or FNCEACCT or ACCT Concurrent Degree students only.

Grading Basis: Pass/Fail

ACCT 6220 (3) Corporate Financial Reporting

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues. Students with credit for ACCT 3220 and 3230 or equivalents may not receive credit for ACCT 6220.

Equivalent - Duplicate Degree Credit Not Granted: MBAX 6700

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-).

ACCT 6250 (3) Financial Statement Analysis

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by investors, security analysts, bank lending officers and auditors. Emphasizes equity analysis.

Equivalent - Duplicate Degree Credit Not Granted: MBAX 6710

Requisites: Requires prerequisite course of ACCT 5250 or MBAC 6020 (minimum grade D-).

ACCT 6260 (3) Seminar: Managerial Accounting

Explores cost management, especially as related to organizational decision making, planning, and control. Emphasizes case analysis and applications.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-).

ACCT 6270 (3) Seminar: Income Determination

Critical analysis of problems and theory of measurement and reporting of periodic net income of business organizations. Net income models, research efforts, and role of professional accounting organizations. Current issues and problems given special attention.

Requisites: Requires prerequisite course of ACCT 3230 (minimum grade D-).

ACCT 6350 (3) Current Issues in Professional Accounting--Accounting Ethics

Examines the nature of accounting theory and practice from perspectives of economics, law, globalization, accounting, ethics, and moral reasoning. Also explores issues including implications of institutional factors, such as Sarbanes-Oxley, SEC, FASB, IFRS, and capital markets. Counts as senior seminar for Concurrent degree students.

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 6420 (3) Research and Writing in Income Taxation

Studies and applies the method used in tax research and tax planning, with the goal of developing tax research, technical writing and tax planning skills. Topics include examining primary and secondary sources of federal tax law, evaluating the hierarchy of these sources and developing technical writing skills using deductive legal reasoning.

Requisites: Requires a prerequisite course of ACCT 5450 (minimum grade D-). Restricted to MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

ACCT 6430 (3) Taxation of Partnerships

Studies federal income taxation of pass-through entities such as those used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6167

Requisites: Requires prerequisite course of ACCT 5450 (min grade D-). Restricted to MS-ACCT or MS-ACTX or C-ACCTACTX or C-FNCEACTX students only.

ACCT 6440 (2-3) Tax Policy

Offers a research seminar exploring policy issues of taxation including recent legislative proposals. Students prepare a publishable research paper on a tax policy topic agreed upon with the instructor.

Requisites: Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 and 6700.

ACCT 6450 (3) Taxation of Corporations

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6157

Requisites: Requires corequisite courses of ACCT 6420 and ACCT 6700. Restricted to Bus Admin, Acct, Acct-Tax, Acct-Info Syst, Mgt Sci-Info Syst, Fnce, Mktg or Master of Business Admin graduate students only.

ACCT 6460 (3) Civil/Criminal Tax Proc**ACCT 6470 (3) Frgn Source Income Tax****ACCT 6490 (3) Taxation of Natural Resources**

Concerned with tax problems encountered in acquisition, operation, and disposition of natural resource properties. Topics include depletion, lease bonuses, intangible drilling costs, depreciation, and financing arrangements. Department enforced requisite: admission to the graduate tax program.

Requisites: Requires a prerequisite course of ACCT 6700 (minimum grade D-).

ACCT 6500 (3) Special Topics in Taxation

Covers a diverse array of issues in taxation. Highlights areas of current interest and draws on the strengths of leading outside authorities as guest lecturers in various topic areas.

Requisites: Requires a prerequisite courses of ACCT 6420 and ACCT 6700 (all minimum grade D-).

ACCT 6620 (3) Advanced Auditing: Business Risk and Decision Analysis

Explores contemporary issues, historical developments, and selected topics pertinent to business assurance services by independent accountants. Emphasizes improving both the decision behavior of decision makers and the quality of information, or its context, for decision makers.

Requisites: Requires a prereq course of ACCT 5620 (min grade D-). Restricted to Acct, Fnce/Acct, Infor Syst/Acct, Syst/Acct Concurrent Degree students or Acct, Acct/Tax or Busn Admin (BUAD) graduate students only.

ACCT 6700 (4) Income Taxation

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6007

Requisites: Requires a prerequisites course of ACCT 5450 (minimum grade D-). Restricted to Accounting (ACCT), MS-ACTX or C-ACCTACTX or FNCEACTX students only.

ACCT 6710 (3) Federal Estate and Gift Tax

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7207

Requisites: Requires prerequisite course of ACCT 5440 (minimum grade D-). Requires corequisite courses of ACCT 6420 6700. Restricted to ACCT, ACIS, ACTX, MBA or BUAD graduate students only.

ACCT 6720 (2) Estate Planning

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7217

Requisites: Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

ACCT 6760 (2-3) State and Local Taxation

Examines the operation of the income, property and sales tax used to finance our state and local governments. Includes requirements of equal protection and due process. Covers jurisdiction to tax allocation of the tax base among different state and local governments.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7507

ACCT 6770 (3) Wills and Trusts**ACCT 6780 (3) International Taxation**

Covers basic aspects of the United States taxation of income earned abroad by its citizens and the taxation of income derived by foreign persons from U.S. sources, including the implications of income tax treaties.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7617

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 6820 (1-3) Graduate Seminar

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in accounting. Department enforced prerequisites: varies

ACCT 6900 (1-6) Independent Study

Prior department consent required of instructor under whose direction study is taken. Departmental form required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

ACCT 6940 (1) Master's Degree Candidacy

Departmental form required.

Requisites: Restricted to Business (BUSN) graduate students only.

Grading Basis: Pass/Fail

ACCT 6950 (1-4) Master's Thesis

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7300 (3) Doctoral Seminar: Introduction to Accounting Research

Discusses the nature of scientific investigation and how accounting theory relates to theories in economics and finance. Introduces students to major areas of accounting research and research methods. Provides students with instruction and experience in evaluating and critiquing research papers as well as generating original and viable research ideas.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7320 (3) Doctoral Seminar: Accounting and Capital Markets I

Focuses on research evaluating the usefulness of accounting information for valuing equity securities. The seminar builds a foundation for conducting accounting-related capital markets research.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7330 (3) Doctoral Seminar: Accounting and Capital Markets 2

Focuses on how managers strategically communicate with capital market participants (e.g., investors and equity analysts). Students develop an understanding of how information enhances the efficiency of stock markets, why managers voluntarily disclose information, and how market participants react to strategic disclosure.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7340 (3) Doctoral Seminar: Managerial Accounting Research

Survey of managerial accounting research, emphasizing a variety of methodologies including economics-based archival empirical and experimental approaches. Topics include: management performance measurement; management incentives; non-financial performance measures; management control systems; cost behavior and cost structure; intra-firm transfer pricing; inter-firm relations and knowledge sharing; risk preferences; risk taking and risk sharing; strategic performance measurement; agency theory; and budgetary slack and performance.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ACCT 6710 (minimum grade D-). Restricted to graduate students only.

ACCT 7800 (3) Doctoral Seminar: Accounting Theory

Follows the evolution of game-theoretical analytical research and application of analytical methods to topics including: accounting-based valuation, discretionary disclosure, stewardship role of accounting, insider trading and imperfect capital market models, signaling through accounting choice, deferred tax accounting, audit sampling, auditor rotation, and low balling. Describes implications of analytical results for primarily economics-based empirical research designs.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 7830 (3) Doctoral Seminar: Accounting Research

Designed to assist the doctoral student in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in accounting. Special attention given to the development of thesis topics.

ACCT 8820 (1-6) Graduate Seminar

Provides opportunity for investigation of new frontiers in accounting through an experimental seminar. Department enforced prereq.: varies

Repeatable: Repeatable for up to 6.00 total credit hours.

ACCT 8900 (1-3) Independent Study

Instructor consent required and departmental form (taught as doctoral seminar).

Requisites: Restricted to Business (BUSN) graduate students only.

ACCT 8990 (1-10) Doctoral Thesis

Requisites: Restricted to Business (BUSN) graduate students only.

Advertising, PR & Media Design (APRD)

Courses

APRD 1000 (3) Creative Industries

Explores creative and strategic thinking and the many industries involved in creating brand communication as well as these industries growing interdependence in a changing media landscape. Considers technology's impact and the effect of commercial culture on an increasingly diverse society.

APRD 1001 (3) Creative Concepts

Introduces students to a disciplined process that is used to create innovative solutions across commercial communication fields. Emphasizes approaches to problem identification and solution that combine research and human insight with a variety of creative thinking techniques. Topics include need finding, structured brainstorming, rapid sketching, storytelling and visual communication.

Requisites: Requires a prerequisite course of APRD 1000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 1002 (3) Introduction to Branding

Designed to help students acquire a basic understanding of brand and brand culture. Emphasis on theories and practical problems to learn effective ways of building a strong brand strategy. Encompasses every facet of making strategic decisions for a brand. Involves understanding the content a consumer requires, how the consumer will come in contact with the brand and what is the goal of the relationship between consumer and content.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 1050 (3) Digital Media Production for Strategic Communicators

Provides intensive training in the theory and skills necessary to create compelling strategic communication content for a variety of digital media platforms and channels. Students will gain hands-on experience writing and producing content for the web, including video, infographics, podcasts, blogs and social media.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 2000 (3) Principles of Advertising

Explores the practice of advertising from a variety of viewpoints including advertisers, agencies and the public. Students will examine advertising via successful campaigns for some of the world's most iconic brands. Topics include history and evolution of the industry, the process of creating ideas in a multi-disciplinary world and challenge of advertising to act ethically and responsibly within society. Cannot be taken concurrently with APRD 2002 or APRD 2003.

Requisites: Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 2002 (3) Principles of Public Relations

Overview of public relations practice and theory including history, media channels and relations, legal and ethical concerns, international and diverse perspectives, and career options. Cannot be taken concurrently with APRD 2000 or APRD 2003.

Requisites: Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 2003 (3) Principles of Design

Provides a comprehensive survey of the ideas, events, and individuals that determined the design of information, objects, culture, and commerce across societies. Students will examine the social, political and cultural contexts that have shaped media design and the ideologies and relationships of similar movements in art and architecture. Cannot be taken concurrently with APRD 2000 or APRD 2002.

Requisites: Requires prerequisite courses of APRD 1001 and APRD 1002 (all minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3000 (3) Intermediate Creative Concepts

Explores both strategic and creative thinking and examines approaches to narrative storytelling as a tool for telling overarching brand stories. Students use the foundation to develop creative briefs and advertising campaigns. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3001 (3) Intermediate Design Concepts

Students are introduced to design elements and principles, research and visual storytelling. They are challenged to communicate intellectual, sensory and emotional concepts by learning a visual vocabulary of type, color, and form expressed in a variety of mediums and dimensions.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3002 (3) Communication Platforms

Explores cross-channel media consumption (television, print, radio, Internet, product placement, word-of-mouth, etc.) and developing evaluative techniques to choose media that will most effectively implement a brand strategy; allows students to learn how to utilize different forms of media in the context of integrated brand communication.

Requisites: Requires a prerequisite course of APRD 2000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 3003 (3) Strategic Communication Research Methods

Provides an opportunity to use and master quantitative and qualitative research methods. Students conduct research and analyze data to determine the targets relationship with specific product categories and identify the emotional and practical needs that create brand relationships.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3004 (3) Account Management

Examines managerial and decision making processes of advertising and related brand communication functions. Emphasis on determining opportunities, integrating with other elements of the promotion mix, setting objectives, establishing budgets, and measuring advertising and communication effectiveness.

Requisites: Requires a prerequisite course of APRD 2000 or JOUR 2403 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only.

APRD 3005 (3) Content Strategy and User Engagement

Explore and understand the importance of content as a brand building tool. Students will gain the ability to use analytics to create strategy that allows the brand to have meaningful and cohesive conversation with its community.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3006 (3) History of Advertising

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-).

Grading Basis: Letter Grade

APRD 3007 (3) Curiosity for Strategists

Introduces students to the practice of curiosity as the basis of creative problem solving. Students will participate in exercises and exploration based projects to increase productive curiosity, critical thinking and creative products, which will inform the development of integrated marketing communication campaigns.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3008 (3) Qualitative Research Methods

Exposes students to the principles and methods of qualitative methodology including interviews, focus groups and ethnography. Explores how these methods inform the practice of strategic communication.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3100 (3) Design for Digital Media

Explores how to create and produce effective and engaging designs for dynamic information across a variety of screens while maintaining brand identity. Extending the design principles learned in previous classes, the student will concept for user interfaces (UI) and navigational frameworks that optimize usability, accessibility.

Requisites: Requires prerequisite course of APRD APRD 3001 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3102 (3) Story Design I

Explores the development of interactive concepts that meet the strategic brief's brand objectives. Emphasis is placed first on developing strong digital ideals. Students also master the styles appropriate for different digital media and then use those skills.

Requisites: Requires prerequisite course of APRD 2000 or APRD 2002 or APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

APRD 3103 (3) Strategic Writing for Public Relations

Emphasis on communication tactics; plan, write and execute public relation tools; audience segmentation; media selection; application of social media channels.

Requisites: Requires a prerequisite course of APRD 2002 (minimum grade C-).

APRD 3112 (3) International Public Relations

Introduces students to the cultural, social and economic issues relevant to strategic communication in the global arena. Provides students with the foundational tools necessary to both understand and effectively navigate the often complex world of strategic intercultural communication. Specific topics will include exploration of the contextual factors that influence public relations practice in different nations/ regions, discussion of the various theoretical models that govern global PR practice and critical evaluation of international PR case studies/ campaigns.

Requisites: Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3300 (3) Crisis Communication in Public Relations

Explores theories and research related to public relations communication before, during and after a crisis; examines the fundamentals of organizational communication, crisis management and strategic planning.

Requisites: Requires prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3301 (3) Social Media Strategies for Public Relations

Emphasis on how social media and internet marketing influence public relations; understand the fundamentals and best practices in social media management, visual communication and mobile applications.

Requisites: Requires prerequisite course of APRD 2000 or APRD 2002 or APRD 2003 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3302 (3) Case Studies in Public Relations

Designed to help develop and refine critical thinking in selecting, creating and applying tools, techniques and principles of public relations to a variety of managerial cases and problem situations.

Requisites: Requires a prerequisite course of APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3304 (3) History of Advertising

Explores the critical moments in advertising history from the start of the Industrial Revolution through the current post digital era.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3500 (3) Story Design II

Explores the uses of story and how the design of story must adapt to different platforms and genres, including both short- and long-form narratives, visual narrative, film, personal essay and advertising copy writing.

Requisites: Requires a prerequisite course of APRD 3102 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 3700 (1-3) Field Study in Strategic Communication

Creates an immersive experience for students in regards to the history, business practices and current thinking of top industry companies. Students will first complete course work at CU Boulder and then travel to major industry hubs to visit advertising, design, PR and other marketing communication companies.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted College of Media, Communication Information (CMCI) or Business (BUSN) majors only with 60-180 units completed.

APRD 4000 (3) Public Relations Event Planning

Introduces students to the planning and execution of special events. Specifically, the course will locate special event planning within the broader context of organizational strategy and will introduce students to project management through proposal development, scheduling, budgeting and evaluation components that underlie successful event production. Will culminate in the execution of a full-scale event near the end of the semester.

Requisites: Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 4010 (3) Strategic Health Communication

Introduces students to theory, research and contemporary concerns in health communication. Focuses on strategic communication for public service and public education campaigns related to health. Includes advertising and health promotion, community relations, public service programs, advocacy, online communities and social media management.

Requisites: Requires a prerequisite course of APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 4100 (3) Brands and Culture

Explores the intersection between culture and marketing communication. Students will examine brand communities, brand and category culture as well as popular culture and the impact on and within marketing communication. The goal is for students to become more aware of the importance of culture in the ability of communication to disrupt the status quo within a market.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4101 (3) Advertising Media Planning

Examine how owned, earned and paid (or traditional and non-traditional) media campaigns are planned, budgeted, executed and evaluated.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4102 (3) Sustainable Brand Practices: Ethics Cases in Advertising and PR

Explore contemporary issues and ethics cases in advertising and public relations and how these practices impact the long-term success of a brand. Students will explore branding concepts and theories of ethics to examine some of the current controversies in which advertising and public relation campaigns are involved and how these issues can be dealt with in an ethical and socially responsible manner.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4300 (3) Strategic Communication Analytics and Metrics

Provide students with a base knowledge of analytics and metrics used in strategic communication. Students will learn how to obtain and clean big data, how to analyze and turn it into insights and how to present and communicate insights into actionable recommendations.

Requisites: Requires a prerequisite course of APRD 2000 or APRD 2002 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4403 (4) Strategic Communication Campaigns

Gives students the opportunity to work in small groups to develop material for an actual client. Examines basic principles of group dynamics and effective teamwork while conducting research, developing strategies and creating a multimedia campaign. All work is presented to the client.

Requisites: Requires prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 or JOUR 3503 or JOUR 3463 (minimum grade C-). Restricted to Strategic Communication (STCM) or Advertising (JADV) majors only with a minimum of 85 hours.

Additional Information: Departmental Category: Advertising Media Design

APRD 4404 (3) Advanced Ad Campaigns NSAC

Work and design an ad campaign for a real world client through the National Student Advertising Competition (NSAC).

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of APRD 3000 or APRD 3001 or APRD 3002 or APRD 3003 or APRD 3004 (minimum grade C-).

Restricted to Strategic Communication (STCM) majors only with a minimum of 80 hours completed.

Grading Basis: Letter Grade

APRD 4453 (3) Advertising and Society

Examines criticisms and contributions of advertising in society and the economy.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) students with a minimum of 73 hours taken.

Additional Information: Departmental Category: Advertising Media Design

APRD 4501 (3) Design for Social Innovation

Provides an introduction to design thinking as a means to drive social change and solve real-world problems. This studio class is project based and asks students to experiment with new behaviors of work and learning, including: collaboration, iteration, prototyping, empathizing, craft and inference. Field work and collaboration with teammates are required.

Requisites: Requires a prerequisite course of APRD 2000 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Grading Basis: Letter Grade

APRD 4503 (3) Portfolio 1

Enhances student conceptual abilities and generates both print and integrated multimedia campaigns. Students work in teams to develop an extensive body of work that's exhibited in an awards show judged by advertising professionals. Instructor consent required.

Requisites: Requires a prerequisite course of APRD 3000 or JOUR 3503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Additional Information: Departmental Category: Advertising Media Design

APRD 4523 (3) Portfolio 2

Gives students an opportunity to develop an extensive body of work. Students create integrated campaigns, which include print, digital and guerilla ideas. Final portfolios are critiqued by both faculty and outside reviewers. Instructor consent required.

Requisites: Requires a prerequisite course of APRD 4503/JOUR 4503 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only.

Additional Information: Departmental Category: Advertising Media Design

APRD 4543 (3) Strategic Brand Management

Examines the theory of branding: what brands are, how brands are created and measured, as well as strategies for managing brands and brand communication.

Requisites: Requires a prerequisite course of APRD 3002 or APRD 3103 (minimum grade C-). Restricted to Strategic Communication (STCM) majors only with a minimum of 70 hours.

Additional Information: Departmental Category: Advertising Media Design

APRD 4600 (3) Design Portfolio I

Develop a variety of design concepts and execute them at a professional level. Students are assigned projects typical of those handled by design firms to demonstrate their ability in areas such as branding, product design, interaction design, etc. Students will also design their own online portfolio. Creative work is presented in a juried show at the end of the semester. Department prerequisite: students must apply with a portfolio, the quality will determine enrollment.

Requisites: Requires a prerequisite course of APRD 3001 (minimum grade C-).

Grading Basis: Letter Grade

APRD 4601 (3) Design Portfolio II

Refine the skills learned in APRD 4600 and further development of work at a professional level. With help from visiting professionals, students continue to develop a body of work that provides their mastery of user-centered design and branding across a variety of real-world assignments. The final portfolio is judged in the student creative show, juried by design professionals. Department prerequisite: students must apply with a portfolio, the quality will determine enrollment.

Requisites: Requires a prerequisite course of APRD 3001 (minimum grade C-).

Grading Basis: Letter Grade

APRD 4700 (3) Advertising Intensive

Immerses students in the process of creating successful communication and deepens their understanding of current industry standards and practices. Students will learn, develop and execute all aspects of the communication process under the guidance of professionals. Offered Maymester only.

Requisites: Requires a prerequisite course of APRD 1000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Strategic Communication (STCM) majors only.

Grading Basis: Letter Grade

APRD 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APRD 4873 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU), Program in Journalism Mass Communication (JOURU) or Strategic Communication (STCM) majors only.

Additional Information: Departmental Category: Advertising Media Design

APRD 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APRD 5001 (3) Brand Design Studio 1

Focuses on the challenges of designing brands targeted to customer needs and desires. The course is structured around the process of identifying brand opportunities, idea generation, design, testing and launch opportunities. Through a series of projects, students address aspects of practice and theory, from brand adaptation of cultural values to maintenance of brand integrity and global design strategies. Where applicable, case studies will supplement studio execution.

Grading Basis: Letter Grade

APRD 5002 (3) Experiential Design Studio 1

Provides a comprehensive understanding of design thinking and its processes to design innovative branded experiences and exchanges in a variety of strategic communication contexts. Students learn design methods applications that can be applied not only to experiential design, but to a problem where design thinking is meaningful to branded experiences. They learn standard and currently practiced design methods and, through repeated application, internalize them into a personal design aesthetic.

APRD 5003 (3) Brand Design Studio 2

Builds on and extends concepts and executions covered in Brand Design 1. While BD Studio 1 grounds the students in core branding concepts and applications, BDS 2 expands both executional skillsets and conceptual frameworks through the development of a unified theory of branding that transforms objects into meaning bearers. Through research, strategic definition, identity, expression, communications and behavior study, students will learn how to create opportunities for complex, meaning centered relationships between people and things.

APRD 5004 (3) Experiential Design Studio 2

Builds on and extends concepts and applications introduced in Experiential Design Studio 1 with a concerted focus on prototyping quickly and often the best way to both communicate and improve one's design. Integrates prototyping activities, along with research and testing techniques, into every stage of the design process. Students will learn how to choose the appropriate method to suit different dimensions of a design problem at different stages in the process and the pitfalls of each approach.

APRD 5005 (3) Critical Making Studio 1

Introduces students to the communication design possibilities of critical making by exploring the conceptual process, research and key questions framed through an iterative approach to problem solving. The learning experience includes hands-on, embodied approaches to problems that generate innovative solutions by crossing the divide between thinking and making and between the screen and physical environments.

APRD 5006 (3) RE: Studio 1

Brings students' attention to design as a form of social innovation and develops awareness of the social, political and economic contexts of design. They become literate in re the often implicit narratives embedded in design products and services, then use scenarios and storytelling to generate new strategies, build and test prototypes and write a case study detailing what was learned.

Grading Basis: Letter Grade

APRD 5007 (3) Critical Making Studio 2

Turns from software to a focus on hardware and physical computing by literally and figuratively disassembling objects: using prototyping, reverse engineering, hardware hacking and circuit bending, design fiction and electronics fabrication (i.e., Arduino, raspberry pi and more). All of this takes place in a shared, open learning environment where students and faculty critically engage with a range of digital production tools and integrates them into ordinary life.

Grading Basis: Letter Grade

APRD 5008 (3) RE: Studio 2

Develops awareness of and access to necessary tools, smart objects for example, that can enable complex dynamics among people, objects and information via a combination of physical and digital design methods, all with an eye to design driven innovation for social change. This course shifts the usual strategic communication design point of view from the typical perspective of "trend noise" and market driven models to identifying actual problems and providing possible design solutions to those problems.

Grading Basis: Letter Grade

APRD 5010 (1) Design Sprint

Executes a five-day, immersive process for answering critical business questions through design, prototyping and testing ideas with sponsoring industry partners. The outcome is a fully functional prototype that is demoed and evaluated on the final day of the sprint. This project based studio is team taught and process based. The tangible outcomes from the project, along with documentation of the process, will go into the students' professional portfolios.

Repeatable: Repeatable for up to 1.00 total credit hours.

Grading Basis: Letter Grade

APRD 5011 (3) Book Lab

Dedicated to building out an industry ready professional portfolio, this immersive studio consists of four client facing project sponsored by and developed in collaboration with the program's industry partners. In a series of three-week intensives, students will work from design briefs to concept, design and solve a variety of design problems for real world clients. Ranging from finished supercomps to functional prototypes - physical, video, projections mapping, etc. - students to market portfolios will demonstrate their command of strategic communication design across a range of media platforms.

Grading Basis: Letter Grade

APRD 5841 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

APRD 5851 (1-6) Graduate Professional Project

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

APRD 5931 (1-3) Internship

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

APRD 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

APRD 6951 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

APRD 7001 (3) Pro Seminar in Strategic Communication

Introduces the scholarly discipline of strategic communication, theories of advertising and PR including theories relating to info processing, psychological responses to messages and creativity; covers pathways to a successful career, developing an academic plan for completing graduate school, conducting research and publishing, awareness of funding possibilities and the art of teaching and academic service. Required for strategic communication track PhD students. Covers the scholarly discipline of strategic communication, theories, pedagogy and the pathways to a successful career among other things.

Grading Basis: Letter Grade

APRD 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Aerospace Engineering (ASEN)

Courses

ASEN 1000 (1) Introduction to Aerospace Engineering Sciences

Introduces aerospace history, curriculum, ethics, and the many areas of emphasis within aerospace engineering. Academic and industry speakers are invited to address various aerospace topics.

Requisites: Restricted to students with 0-26 credits (Freshmen)

Aerospace Engineering (ASEN) or Engineering Open Option majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 1022 (3) Materials Science for Aerospace Engineers

Covers prerequisite chemistry topics for materials science and introduces material types, properties and behavior for aerospace engineers.

Topics include review of chemistry; atomic bonding; crystals; diffusion; mechanical/thermal properties; phase diagrams; heat treatment; failure mechanisms; materials selection; and a general introduction to modern materials for aerospace engineering applications including composites, nanomaterials and metamaterials. Lab project or tensile testing is included.

Requisites: Requires prerequisite courses of APPM 1350 or MATH 1300 (minimum grade C). Requires corequisite courses of CHEN 1310 or ECEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320. Restricted to Aerospace Engineering (ASEN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 1400 (3) Gateway to Space

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 2500

Requisites: Restricted to College of Engineering students with a maximum of 50 credit hours.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 1969 (3) Pathway to Space

Explore the many paths one can take to be a part of a space-related career in a unique, engaging and interactive course. Students will learn about the following topics: space science and exploration, human spaceflight and life sciences, aeronautics and near space, launch and spacecraft systems, climate and environment, space business, policy and politics, space arts, media, and history.

Requisites: Restricted to Space Minor students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Specialized Courses

ASEN 2001 (4) Aerospace 1: Introduction to Statics, Structures, and Materials

Introduces models and analytical/numerical methods for statics and structural analysis. Topics include force/moment equilibrium, truss analysis, beam theory, stress/strain, failure criteria, and structural design. Matlab proficiency required. Offered fall only.

Requisites: Requires prereqs of PHYS 1110 APPM 1350 or MATH 1300 APPM 1360 or MATH 2300 CSCI 1310 or 1320 CHEN 1310 or CSCI 1300 or ECEN 1310 (all min grade C). Requires coreqs of ASEN 2002 2012 APPM 2350. Restricted to Aerospace Eng (ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 2002 (4) Aerospace 2: Introduction to Thermodynamics and Aerodynamics

Introduces the fundamental principles and concepts of thermodynamics and fluid dynamic systems. Emphasizes the synthesis of basic science (physics), mathematics and experimental methods that form the basis for quantitative and qualitative analyses of general aerospace technology systems. Proficiency in Matlab required. Offered fall only.

Requisites: Requires prereqs of PHYS 1110 APPM 1350 or MATH 1300 APPM 1360 or MATH 2300 CSCI 1310 or 1320 CHEN 1310 or CSCI 1300 or ECEN 1310 (all min grade C). Requires coreqs of ASEN 2001 2012 APPM 2350. Restricted to Aerospace Eng (ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 2003 (5) Aerospace 3: Introduction to Dynamics and Systems

Introduces the principles of particle and planar rigid body dynamics, systems, and controls. Topics include kinematics, kinetics, momentum and energy methods, system modeling, and simple feedback control. Class includes experimental and design laboratory exercises for aerospace applications of dynamic principles. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2001 and ASEN 2012 and APPM 2350 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2004. Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 2004 (5) Aerospace 4: Aerospace Vehicle Design and Performance

Introduction to design and analysis of aircraft and spacecraft. Aircraft topics include cruise performance, wing design, propulsion, stability, control, and structures. Spacecraft topics include rocket staging, orbit selection, launch systems, and spacecraft subsystems. Includes laboratory experiments and team design exercises. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2001 and ASEN 2002 and ASEN 2012 and APPM 2350 (all minimum grade C). Requires corequisite courses of APPM 2360 and ASEN 2003. Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 2012 (2) Experimental and Computational Methods in Aerospace Engineering Sciences

Introduces statistical, experimental, and computational methods used in aerospace engineering sciences. Usage of MatLab is extensive. Offered fall only.

Requisites: Requires a prerequisite course of CHEN 1310 or CSCI 1300 or ECEN 1310 or CSCI 1310 or CSCI 1320 (min grade C). Requires corequisite courses of ASEN 2001 and ASEN 2002 and APPM 2350.

Restricted to Aerospace Eng (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 2519 (1-6) Special Topics

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the lower-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisites: varies.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Specialized Courses

ASEN 2849 (1-3) Independent Study

Study of special projects agreed upon by student and instructor. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 3036 (3) Introduction to Human Spaceflight

Introduces students to the challenges of human space flight. Historical and current space programs and spacecraft are discussed with emphasis on those systems specific to sustaining human crews. Other topics include space environment with respect to sustaining human life and health, physiological and psychological concerns in a space habitat, astronaut selection and training, anomalies, mission operations motivation, costs rationale for human space exploration, and future program directions. Not accepted as a Professional Area Elective for ASEN majors.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 3046 (3) Introduction to Humans in Aviation

Investigates the history of manned aviation accomplished through a review of the history of flight, the physiological and psychological limitations facing aviators, and investigates the human related causal factors in aviation accidents. The course also looks at the social and economic impacts of aviation in modern society. Not accepted as a Professional Area Elective for ASEN majors.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 3111 (4) Aerodynamics

Develops the fundamental concepts of aerodynamics and provides a working knowledge for their application to the design of aircraft and launch vehicles operating at various speeds and altitudes, as well as the atmospheric forces on satellites. Offered fall only.

Requisites: Requires prerequisite courses of ASEN 2002 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 3112 (4) Structures

Teaches Mechanics of Materials methods of stress and deformation analysis applicable to the design and verification of aircraft and space structures. It offers an introduction to matrix and finite element methods for truss structures, and to mechanical vibrations. Offered fall only.

Requisites: Requires prerequisite courses of ASEN 2001 and ASEN 2003 and ASEN 2004 and APPM 2360 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 3113 (4) Thermodynamics and Heat Transfer

Focuses on the applications of the first and second laws of thermodynamics to control volumes and teaches the fundamental concepts of different modes of energy and heat transfer. Learn to use these concepts in gas dynamics, high-speed vehicle spacecraft design, environmental systems, and energy analysis. Offered fall only.

Requisites: Requires prerequisite courses of ASEN 2002 and APPM 2350 or MATH 2400 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 3116 (3) Introduction to Biomedical Engineering

Addresses human responses to environment and physical stimuli. Makes use of engineering and physical principles in the study of human dynamics, arriving at reasonable solutions to 15 major areas of biomedical consent. Instructor consent required.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 3128 (4) Aircraft Dynamics

Develops the fundamental concepts of aircraft dynamics. Covers flight mechanics, performance, dynamics and control of aircraft and how they impact aircraft design. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2002 and ASEN 2003 and ASEN 2004 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 3200 (4) Orbital Mechanics/Attitude Dynamics and Control

Presents the fundamentals of orbital mechanics, 3D rigid body dynamics and satellite attitude dynamics and controls. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2003 and ASEN 2004 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 3300 (4) Aerospace Electronics and Communications

Provides the fundamentals of electronics and communications widely used in aerospace engineering. Includes analog instrumentation electronics, data acquisition, digital electronics and radio communication. Offered spring only.

Requisites: Requires prerequisite courses of ASEN 2003 and PHYS 1120 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 3519 (1-4) Special Topics

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisite: varies.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Specialized Courses

ASEN 3930 (6) Aerospace Engineering Cooperative Education

Students will participate in a previously arranged, department-sponsored cooperative education program with a government agency or industry.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Aerospace Engineering (ASEN) majors only.

Recommended: Prerequisite GPA above 3.0.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Specialized Courses

ASEN 4010 (3) Introduction to Space Dynamics

Includes central force fields, satellite orbits, rocket dynamics, orbital transfer, interplanetary mission analysis, and perturbation due to atmospheric drag and Earth oblateness.

Requisites: Requires prerequisite course of ASEN 3200 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 4012 (3) Aerospace Materials

Studies aerospace grade aluminum, magnesium, nickel, and titanium alloys. Covers heat treatment, defect structures, failure mechanisms, corrosion and its prevention, the effect of space radiation on materials, and high and low temperature effects. Introduces composite materials with a lab design and experiment. Emphasizes the selection of materials in design with procedures for choosing materials rationally. Case studies include aerogels, carbides, composites, powder metallurgy, nanomaterials, and advanced materials manufacturing technologies.

Requisites: Requires prerequisite course of ASEN 2001 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 4013 (3) Foundations of Propulsion

Describes aerothermodynamics and design of both rocket and air-breathing engines. Includes ramjets, turbojets, turbofans, and turboprop engines, as well as liquid, solid, and hybrid rockets.

Requisites: Requires prerequisite courses of ASEN 3113 and APPM 2360 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 4018 (4) Senior Projects 1: Design Synthesis

Focuses on the synthesis of technical knowledge, project management, design process, leadership, and communications within a team environment. Students progress through the design process beginning with requirements development, then preliminary design and culminating with critical design. Offered fall only.

Requisites: Requires prereq courses of ASEN 3111, 3112, 3113, 3128, 3200 and 3300 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engr (ASEN) Aerospace or Engr-Concurrent Degree (C-ASEN) students majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4028 (4) Senior Projects 2: Design Practicum

Focuses on the fabrication, integration, verification and validation of designs produced in ASEN 4018. Students work within the same teams from ASEN 4018. Department consent required. Offered spring only.

Requisites: Requires prerequisite course of ASEN 4018 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4057 (3) Aerospace Software

Provides an overview of prevalent software and hardware computing concepts utilized in practice and industry. Establishes the background necessary to tackle programming projects on different computing platforms with various software tools and programming languages.

Requisites: Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites CSCI 1320 or ECEN 1310 or CHEN 1310.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 4090 (3) Global Positioning Systems Applications

Focuses on GPS technology, software development, and applications. Lectures will cover the principal concepts used in GPS, and weekly laboratories will apply that knowledge. Culminates in student design projects using GPS.

Requisites: Requires prerequisite courses of APPM 2360 and CHEN 1310 (all minimum grade C).

Recommended: Prerequisite junior/senior standing in engineering.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 4114 (3) Automatic Control Systems

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5114

Requisites: Requires prerequisite courses of ASEN 3128 and ASEN 3200 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 4123 (3) Vibration Analysis

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4123

Requisites: Requires prerequisite course of ASEN 3112 or MCEN 3030 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 4128 (3) Human Factors in Engineering and Design

Introduces the field of human factors engineering and investigates human psychological, physiological and performance limitations in complex systems and why it is vital for engineers to understand human operational limitations when designing complex systems. Course includes studies of real accidents caused by human error, good and bad designs, latent conditions and accident-producing designs. Goal is an understanding of how to conduct engineering design with consideration of human factors.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4138 (3) Aircraft Design

Two lectures and one lab per week. Examines principles of aircraft configuration and design to meet given performance specifications, taking into account aerodynamic, stability and control, and flying quality considerations, as well as airworthiness regulations. Includes preliminary design of the major elements of an aircraft.

Requisites: Requires prerequisite course of ASEN 3128 (minimum grade C). Restricted to Aerospace Engineering (ASEN) or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5215 and ATOC 4215 and ATOC 5215

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 4216 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5216 and ECEN 4811

Requisites: Requires prerequisite course of ASEN 3300 or ECEN 2260 or ECEN 3030 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 4218 (3) Large Space Structures Design

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5218

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engineering (ASEN) or Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4222 (3) Materials Science for Composite Manufacturing

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5222

Requisites: Requires prerequisite course of ASEN 3112 and prerequisite or corequisite course of ASEN 4012 (all minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 4238 (3) Computer-Aided Control Systems Design

Covers Matlab and Simulink software, and multivariable control system synthesis and analysis techniques for typical aerospace control problems. Students formulate control problems and synthesize control functions using lineare quadratic techniques. Includes numerical integration of differential equations and nonlinear simulation of orbit and attitude dynamics.

Requisites: Requires prerequisite course of APPM 2360 (minimum grade C).

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4248 (3) Computer-Aided Control System Design 2

Studies theory and engineering applications of Kalman filter techniques. Covers discrete and continuous filters, the extended Kalman filter, and their application to guidance, navigation, and control, including satellite orbit and attitude problems, inertial and control navigation, and the Global Positioning System.

Requisites: Requires prerequisite course of ASEN 4238 (minimum grade C).

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 4255 (3) Environmental Aerodynamics

A review of the properties and causes of hazards posed by the environment, ranging from atmospheric wind shear to tornadic flows. Involves a multidisciplinary approach combining analytical, numerical, scale modeling studies with extensive field measurements, wind energy and biophysical aerodynamics.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5255

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 4338 (3) Computer Analysis of Structures

Covers basic structural design concepts and finite element modeling techniques. Emphasizes use of finite element static and dynamic analysis to validate and refine an initial design. Introduces basic design optimization and tailoring. Proficiency in Matlab required.

Requisites: Requires prerequisite course of ASEN 3112 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 4426 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5426 and ECEN 4821 and ECEN 5821

Requisites: Requires prerequisite course of ASEN 3300 or ECEN 2260 or ECEN 3030 (minimum grade C). Restricted to Aerospace Engineering (ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 4519 (1-3) Special Topics

Studies specialized aspects of the aerospace engineering sciences or innovative treatment of required subject matter at the upper-division level. Course content is indicated in the online Schedule Planner. Department enforced prerequisite varies.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Specialized Courses

ASEN 4849 (1-6) Independent Study

Special projects agreed upon by student and instructor. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 4859 (1-6) Undergraduate Research

Assigns a research problem on an individual basis. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 5007 (3) Introduction to Finite Elements

Introduces finite element methods used for solving linear problems in structural and continuum mechanics. Covers modeling, mathematical formulation, and computer implementation.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite matrix algebra.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5010 (3) Spacecraft Attitude Dynamics and Control

Includes rigid body kinematics and spacecraft attitude descriptions, torque-free attitude dynamics, static attitude determination, motion and stability due to gravity gradient torque and spinning craft, passive and active methods of attitude control, nonlinear regulator and attitude tracking feedback control laws.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 5012 (3) Mechanics of Aerospace Structures

Applies fundamental concepts of continuum mechanics, theory of elasticity and energy methods to the analysis of structures.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5023

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites APPM 2360 and ASEN 2001 and ASEN 2003 and ASEN 3112 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5014 (3) Linear Control Systems

Introduces the theory of linear systems, including vector spaces, linear equations, structure of linear operators, state space descriptions of dynamic systems, and state feedback control methods.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Systems and Control

ASEN 5016 (3) Space Life Sciences

Familiarizes students with factors affecting living organisms in the reduced-gravity environment of space flight. Covers basic life support requirements, human physiological adaptations, and cellular-level gravity dependent processes with emphasis on technical writing and research proposal preparation.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5018 (3) Graduate Projects I

Exposes MS and PhD students to project management and systems engineering disciplines while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this first semester of the two-semester course sequence: requirements, definition, design and design review, build, test, and verification.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5158 or instructor consent required.

ASEN 5022 (3) Dynamics of Aerospace Structures

Applies concepts covered in undergraduate dynamics, structures and mathematics to the dynamics of aerospace structural components, including methods of dynamic analysis, vibrational characteristics, vibration measurements and dynamic stability.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5012 or ASEN 5227 or MATH 2130 or APPM 3310 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5034 (3) Stochastic Methods for Systems Engineering

Development of stochastic models used in aerospace and other systems engineering and optimization problems. Review of probability theory, stochastic models used in decision theory, random processes, queuing theory, information theory, reliability and quality control. Computer solutions required.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5037 (3) Turbulent Flows

Studies turbulent closure methods and computational procedures used to solve practical turbulent flows. Emphasizes multi-equation models used with time-averaged equations to calculate free-turbulent shear-flows and turbulent boundary layers. Employs spectral methods in direct and large-eddy simulation of turbulence. Formerly ASEN 6037.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5051 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5044 (3) Statistical Estimation for Dynamical Systems

Introduces theory and methods of statistical estimation for general linear and nonlinear dynamical systems, with emphasis on aerospace engineering applications. Major topics include: review of applied probability and statistics; optimal parameter and dynamic state estimation; theory and design of Kalman filters for linear systems; extended/unscented Kalman filters and general Bayesian filters for nonlinear systems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 5047 (3) Probability and Statistics for Aerospace Engineering Sciences

Considers probability concepts and theory for better design and control of aerospace engineering systems. Includes descriptive and inferential statistical methods for experimental analysis. Covers discrete and continuous random variable distributions, estimators, confidence intervals, regression, analysis of variance, hypothesis testing, nonparametric statistics, random processes and quality control, including software models of same.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5050 (3) Space Flight Dynamics

Includes celestial mechanics, space navigation, and orbit determination; trajectory design and mission analysis trajectory requirements; and orbital transfer and rendezvous.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 5051 (3) Fluid Mechanics

Highlights physical properties of gases and liquids; kinematics of flow fields; and equations describing viscous, heat-conducting Newtonian fluids. Emphasizes exact solutions and rational approximations for low and high speed dissipative flows, surface and internal waves, acoustics, stability, and potential flows.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5053 (3) Rocket Propulsion

An in depth presentation of the theory, analysis, and design of rocket propulsion systems. Liquid and solid propellant systems are emphasized with an introduction to advanced propulsion concepts. Nozzle and fluid flow relationships are reviewed for background.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 5063 (3) Aircraft Propulsion

Designed to teach the theory, analysis and design of engines used for aircraft propulsion. Will deal with engine selection, engine performance, analysis and design of various components of modern aircraft engines, with emphasis on recent developments such as the geared turbofan.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4013 or equivalent or instructor consent required.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 5090 (3) Introduction to Global Navigation Satellite Systems

Global Navigation Satellite Systems (GNSS) are important tools for navigation, science, and engineering. Introduces GNSS hardware, signal structure, algorithms, error sources, and modeling techniques. Programming experience is required.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 5098 (3) System Engr and Design

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5111 (3) Introduction to Aeroelasticity

Introduces static and dynamic aeroelasticity of airfoils and wings. Covers the classical aeroelasticity theory and introduces computational methods for aeroelastic problems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 3111 or MATH 2130 or APPM 3310 and MATH 3430 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5114 (3) Automatic Control Systems

Methods of analysis and design of feedback control for dynamic systems. Covers nyquist, bode and linear quadratic methods based on frequency domain and state space models. Laboratory experiments provide exposure to computation for simulation and real time control, and typical control system sensors and actuators.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4114

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 3128 and ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Systems and Control

ASEN 5122 (3) Control of Aerospace Structures 1

Introduces the basic problems in dynamic modeling and active control of large spacecraft and satellites. Includes system descriptions, model reduction, controller design, and closed-loop stability analysis.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5148 (3) Spacecraft Design

Integrates the design elements and fundamental analyses necessary to complete the conceptual (Phase A) design of an unmanned spacecraft. Lecture and discussion explore mission design, propulsion, power, structure, thermal, attitude control, communication, command, and data handling and attitude control systems. The role of project management and systems engineering are examined. Resource estimating and lessons learned in satellite programs are reviewed.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5151 (3) High Speed Aerodynamics

Provides aerodynamic theory applicable to the high speed flight of subsonic, transonic, and supersonic aircraft, and hypersonic vehicles. Topics include linear theory of subsonic and supersonic speeds, the nonlinear theories of transonic and hypersonic speeds, and compressible boundary layers.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5158 (3) Space Habitat Design

Utilizes systems engineering methods for designing a spacecraft intended for human occupancy and provides a working knowledge of the technologies used to sustain life. Emphasis is placed on deriving functional requirements from stated mission objectives, developing integrated vehicle schematics, and comparing design options by trade study.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5168 (3) Remote Sensing Instrumentation Design

Reviews and makes a detailed analysis of satellite instrumentation techniques and systems to understand the components, limitations, and overall capabilities. Emphasis on optical systems with in-depth treatment of conventional radiometry. Introduces both passive and microwave methods.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5188 (3) Fundamentals of Systems Engineering

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

Equivalent - Duplicate Degree Credit Not Granted: EMEN 5405

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5210 (1) Remote Sensing Seminar

Covers subjects pertinent to remote sensing of the Earth, including oceanography, meteorology, vegetation monitoring, and geology. Emphasizes techniques for extracting geophysical information from satellite data. Course requirement for Remote Sensing Certificate. Formerly ASEN 6210.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 5212 (3) Composite Structures and Materials

Develops the macromechanical and micromechanical theory of the elastic behavior and failure of composite laminates. Applies basic theory to a broad range of practical problems including the buckling and vibration of composite plates, columns, and shells.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4215 and ATOC 4215 and ATOC 5215

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5216 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4216 and ECEN 4811 and ECEN 5811

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5218 (3) Large Space Structures Design

Develops the necessary structural analysis skills for conducting conceptual and preliminary designs of large space structures with a practical emphasis on structures considered by NASA over the past 20 years. Applies analysis skills to a broad range of space missions requiring large space structures, emphasizing low cost and practical design.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4218

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5222 (3) Materials Science for Composite Manufacturing

Studies common matrix materials and the modifications and improvements of properties which can be achieved by adding second phase reinforcements. Properties will be significantly affected by the design approach and by requirements, and by the procedure of adding reinforcements. Investigates polymer, ceramic and metallic materials. Explores manufacturing, fabrication and processing techniques. Evaluates future developments.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4222

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 3112 and ASEN 4012 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5227 (3) Mathematics for Aerospace Engineering Sciences 1

Provides an introduction to the methods and mathematics of advanced engineering analysis tailored to aerospace engineering applications. Topics include vector and tensor calculus, ordinary differential equations, and an introduction to the calculus of variations.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5235

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite one year of calculus-based physics and math up through differential equations.

Additional Information: Departmental Category: Remote Sensing

ASEN 5245 (3) Radar and Remote Sensing

Examines active techniques of remote sensing, with emphasis on radar fundamentals, radar wave propagation, scattering processes, and radar measurement techniques and design. Examines specific radar systems and applications, such as synthetic aperture radar phased arrays for atmosphere, space, land, and sea applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 5255 (3) Environmental Aerodynamics

A review of the properties and causes of hazards posed by the environment, ranging from atmospheric wind shear to tornadic flows. Involves a multidisciplinary approach combining analytical, numerical, scale modeling studies with extensive field measurements, wind energy and biophysical aerodynamics.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4255

Recommended: Prerequisite senior standing in aerospace engineering.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5307 (3) Engineering Data Analysis Methods

Gives students broad exposure to a variety of traditional and modern statistical methods for filtering and analyzing data. Topics include estimation methods, principal component analyses and spectral analyses. Introduces these methods and provides practical experience with their use. Students carry out problem assignments.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5315 (3) Ocean Modeling

Introduces students to basic principles behind, and the current practices in, ocean modeling. Discusses different prevailing approaches. Offers students hands-on experience with the use of supercomputers and work stations for model running and pre- and post-processing.

Recommended: Prerequisite graduate standing or instructor consent required.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5321 (3) Computational Fluid Dynamics Structured Grid

Introduction to advanced computational methods for the solution of fluid mechanics problems on the computer with emphasis on nonlinear flow phenomena. Formerly ASEN 6327.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5417 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5325 (3) Small Scale Processes in Geophysical Fluids

Provides an overview of mixing and wave processes in the oceans and the atmosphere. Topics include turbulent boundary layers in the lower atmosphere and the upper ocean, air-sea interactions, and surface and internal waves.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5331 (3) Computational Fluid Dynamics Unstructured Grid

Focuses on unstructured grid computational approaches to solve the Navier-Stokes equations. Assumes a basic knowledge of the solution of partial differential equations with numerical methods with focus finite element/volume methods (FEM/FVM but primarily FEM). These issues include: the discrete formulation, non-linear equation iterator, linear equation formation, boundary condition prescription and linear equation solution.

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 5335 (3) Aerospace Environment

Examines the components of the solar-terrestrial system and their interactions to provide an understanding of the re-entry and orbital environments within which aerospace vehicles operate. Includes the sun, solar wind, magnetosphere, ionosphere, thermosphere, radiation belts, energetic particles, comparative environments (Mars, Venus, etc.), orbital debris, spacecraft charging, particle effects on systems, shielding, and satellite drag.

Recommended: Prerequisite senior or graduate standing in engineering or related physical sciences.

Additional Information: Departmental Category: Atmospheric, Oceanic, and Space Sciences

ASEN 5347 (3) Math Methods in Dynamics

Two-part graduate-level course on dynamics. Covers both flexible and rigid multibody analytical dynamics and finite element method for dynamics. Emphasizes formulations that naturally lead to easy computer implementation and stability, linearization, and modern rotational kinematics. Department consent required.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 5417 (3) Numerical Methods in Engineering and Science

Provides computational skills and basic knowledge of numerical methods for advanced courses in engineering/scientific computation using Fortran, C, or Matlab.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite APPM 2360 or equivalent or instructor consent required.

Additional Information: Departmental Category: Computational and Analytic Methods

ASEN 5426 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4426 and ECEN 4821 and ECEN 5821

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5436 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4831 and ECEN 5831

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5440 (3) Mission Design and Development for Space Sciences

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5780

Grading Basis: Letter Grade

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 5506 (1-2) Bioastronautics Seminar

Focuses on current topics related to space habitat systems design and research aimed at understanding the effects of spaceflight on living organisms ranging from humans down to microbes. Literature analysis and scientific presentations are expected. Emphasis is on biophysical mechanisms, comprehensive models, and related technology development.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 5519 (1-3) Selected Topics

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Class Search.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite varies.

Additional Information: Departmental Category: Specialized Courses

ASEN 5849 (1-6) Independent Study

Study of special projects.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Specialized Courses

ASEN 5940 (3-6) Engineering Research Internship

Grants credit to foreign visiting graduate students for conducting research within the Aerospace Engineering Sciences department. Credits can be transferred to the student's home institution. CU-Boulder students may also receive credit for conducting research outside of the university, either overseas or in the US.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Specialized Courses

ASEN 6001 (3) Reacting Flows

Provides an introduction to reacting flows and combustion. Covers chemical kinetics, including global and detailed mechanisms and the variable density flow equations are derived. Relevant non-dimensional parameters and limiting behaviors are discussed. The Rankine-Hugoniot relations are presented and various aspects of diffusion, kinetically dominated and balanced combustion are outlined. Flame structures are discussed, including laminar and turbulent flames, and the Burke-Schumann solution is outlined. The turbulent forms of the motion equations are derived and the reactive scalar transport equation and mixture fraction variable are presented. The flamelet progress variable approach is outlined, including a comparison of steady and unsteady flamelet models. Specific topics in spray combustion, triple flames, solid-gas reactors and detonations are discussed.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 6001

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6008 (3) Interplanetary Mission Design

Exploration of principles and methods related to the design and construction of trajectories for interplanetary mission design. Some topics covered include: two-and three-body motion, gravity assists, maneuver computation, navigation, numerical integration, and construction of orbits. The main focus is on simple ballistic mission designs, such as Galileo or Cassini, however, libration point trajectories will also be covered.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5050 or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6009 (1-2) Special Topics Seminar

Presents research and developments in each department's focus areas.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Specialized Courses

ASEN 6010 (3) Advanced Spacecraft Dynamics and Control

Studies the dynamic modeling and control of spacecraft containing multiple momentum exchange devices, and/or flexible spacecraft components. Will develop nonlinear feedback control algorithms, explore singularity avoidance strategies. The second half of the course derives analytical methods (D'Alembert's equations, Lagrange's equations, Boltzmann Hamel equations) to model a hybrid rigid/flexible spacecraft system.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6013 (3) High Speed Propulsion

Covers air-breathing and rocket propulsion cycles, their relative performance trade-offs, and how they fit within the context of a vehicle system. Specific emphasis will be placed on fundamental cycle analyses, component level design, and propulsion/airframe integration for rockets, turbojets, ramjets, scramjets, combined cycles, and other advanced propulsion concepts.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4013 or equivalent or instructor consent required.

Additional Information: Departmental Category: Thermodynamics and Propulsion

ASEN 6014 (3) Spacecraft Formation Flying

Studies the dynamic modeling and control of spacecraft formations orbiting about a planet. Investigate linear and nonlinear relative motion descriptions, rectilinear and curvilinear coordinates, orbit element difference based descriptions, J2-invariant relative orbits, as well as Lyapunov-based relative motion control strategies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5050 or instructor consent required.

Additional Information: Departmental Category: Systems and Control

ASEN 6020 (3) Optimal Trajectories

Introduces the theory and practice of trajectory optimization. The general theory behind optimization and optimal control will be introduced with an emphasis on the properties of optimal trajectories. The main application will be to space trajectories, but other applications will also be considered.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites ASEN 5050 and ASEN 5014 or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6021 (3) Viscous Flow

Studies low Reynolds number flows, including incompressible and compressible laminar boundary layer theory; similarity theory; and separation, transition, and turbulent boundary layers.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5051 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6024 (3) Nonlinear Control Systems

Introduces the analysis and control design methods for nonlinear systems, including Lyapunov and Describing Function methods.

Requisites: Requires prerequisite course of ASEN 5014 (minimum grade C). Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Systems and Control

ASEN 6028 (3) Graduate Projects II

Exposes MS and PhD students to leadership positions in project management and systems engineering while working a complex aerospace engineering project as part of a project team. The project team may perform some or all of the following project activities during this second semester of the two-semester course sequence: requirements definition, design and design review, build, test, and verification.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 4138 or ASEN 5148 or ASEN 5018 or ASEN 5158 or instructor consent required.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 6050 (3) Space Instrumentation

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6050 and GEOL 6050

Requisites: Requires prerequisite course of ASEN 5335 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 6060 (3) Advanced Astrodynamics

Covers Lagrangian and Hamiltonian formalisms for astrodynamics problems, the computation and characterization of space trajectories in highly dynamic environments, computation of periodic orbits, stability analysis of orbital motion, and development of analytical theories for dynamics.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5050 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6061 (3) Molecular Gas Dynamics and DSMC

Describes the composition and flow of gases on a microscopic level to examine the behavior of the molecules that make up a macroscopic flow system. Thermodynamic properties, transport phenomena, and the governing Boltzmann Equation are derived from molecular collision dynamics and the kinetic theory. The Direct Simulation Monte Carlo method is introduced with applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6070 (3) Satellite Geodesy

Focuses on the measurement of the Earth's gravitational field, rotational characteristics, and shape using Earth and space-based tracking of artificial satellites. Particular emphasis on satellite altimetry and satellite gravity measurements.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 3200 or equivalent or instructor consent required.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6080 (3) Statistical Orbit Determination

Course on orbit and advanced estimation techniques. Emphasizes orthogonal transformation techniques such as Givens and Householder, square root filtering and smoothing and considers covariance analysis. Also nonlinear filters and dynamic model compensation techniques. Requires term project that involves the application of many of the techniques required for precise orbit determination.

Requisites: Requires prerequisite course of ASEN 5044 (minimum grade D-). Restricted to Aerospace Engineering (ASEN) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Additional Information: Departmental Category: Astrodynamics and Orbital Mechanics

ASEN 6090 (3) Advanced Global Navigation Satellite Systems: Software and Applications

Focuses on high-precision applications of Global Navigation Satellite Systems (GNSS) and the software tools that are needed to achieve these precisions. Topics include precise orbital determination, reference frames, atmospheric delays, relativity, clock models, ambiguity resolution, and scientific applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5090 or instructor consent required.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 6091 (3) Global Navigation Satellite System (GNSS) Receiver Architecture

Investigates the overall architecture of satellite navigation receivers: including both the analog radio frequency conditioning (antenna to the analog-to-digital converter) and the various signal processing algorithms. Such treatment of the operation of the receiver will provide insight into the trade-offs that go into GNSS as well as the more broad generic spread spectrum receiver design.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5090.

Additional Information: Departmental Category: Global Positioning Systems

ASEN 6107 (3) Nonlinear Finite Element Methods

Continuation of ASEN 5007. Covers the formulation and numerical solution of nonlinear static structural problems by finite element methods. Emphasizes the treatment of geometric nonlinearities and structural stability.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5007 or equivalent or instructor consent required.

Additional Information: Departmental Category: Specialized Courses

ASEN 6116 (3) Spacecraft Life Support Systems

Study the environmental control and the life support systems and technologies that keep people alive and healthy in spacecraft and habitats. Students will learn about thermal control systems, air revitalization processes, water reclamation and treatment, waste handling and the reuse of materials, and food and nutrition. Expect to develop analytical models from first principles and perform hands-on laboratory experiments. Formerly ASEN 5116.

Requisites: Requires prerequisite course of ASEN 5158 (minimum grade D-). Requires corequisite course of ASEN 5016. Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Bioastronautics and Microgravity Science

ASEN 6220 (3) Topics in Remote Sensing

Covers infrared and microwave techniques for remote sensing, emphasizing oceanographic applications, fundamentals of electromagnetic radiation, remote sensing instrumentation (radars and radiometers), and conversion of sensory data to geophysical parameters, including sea surface topography, temperature, and atmospheric moisture.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 6265 (3) Fundamentals of Spectroscopy for Optical Remote Sensing

Provides a comprehensive overview of the fundamentals of quantum physics, atomic spectroscopy, molecular spectroscopy and laser spectroscopy. Exposes students to the spectroscopy applications in modern optical and laser remote sensing. Assists students to develop the fundamental knowledge and skills for independent learning.

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

ASEN 6337 (3) Remote Sensing Data Analysis

Reviews satellite remote sensing instrumentation and methods. Student teamwork involves real satellite data for applications in oceanography, atmospheric science, and terrestrial physics. Students develop problem-solving skills and use the internet to gather satellite and in situ data to address chosen problems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Additional Information: Departmental Category: Remote Sensing

ASEN 6365 (3) Lidar Remote Sensing

Provides a comprehensive, yet easily understandable, up-to-date understanding of lidar principles, technologies and applications. Contains approaches for quantitative lidar simulation, lidar sensitivity and error analysis, lidar data retrieval, lidar system design and performance analysis. Gives students opportunities to see and operate real state-of-the-art lidar systems and make connections to lidar experts in the nation and world.

Requisites: Restricted to Engineering (ENGR) graduate students or Aerospace Engineering-Concurrent Degree (C-ASEN) students.

Additional Information: Departmental Category: Aerospace Design and System Engineering

ASEN 6367 (3) Advanced Finite Element Methods for Plates, Shells, and Solids

Continues ASEN 5007. Covers more advanced FEM applications to linear static problems in structural and continuum mechanics. Focuses on modeling, formulation and numerical solutions of problems modeled as plates, shells and solids. Includes an overview of advanced variational formulations.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite introductory graduate level course in FEM and familiarity with linear algebra.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 6412 (3) Uncertainty Quantification

This advanced topics course provides an exploration of techniques for representation and propagation of uncertainty in PDE/ODE-based systems.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisites APPM 5570 and ECEN 5612 (all minimum grade B) or equivalent courses with instructor consent.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 6427 (3) Advanced Computational Fluid Dynamics

Introduces computational techniques particularly applicable to high-speed gas flows that contain shocks. Complicated numerical methods are developed from relatively simple numerical modules.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5417 or equivalent or instructor consent required.

Additional Information: Departmental Category: Aerodynamics and Fluid Mechanics

ASEN 6517 (3) Computational Methods In Dynamics

Covers modeling, computational algorithms and their computer implementation for both linear and nonlinear dynamical systems. Topics covered include transient analysis, wave propagation, multiphysics analysis, and their significant engineering applications.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite ASEN 5022 or equivalent or instructor consent required.

Additional Information: Departmental Category: Structures, Materials, and Structural Dynamics

ASEN 6519 (1-3) Special Topics

Reflects upon specialized aspects of aerospace engineering sciences. Course content is indicated in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGR) graduate students or Aerospace Engineering Concurrent Degree (C-ASEN) majors only.

Recommended: Prerequisite varies.

Additional Information: Departmental Category: Specialized Courses

ASEN 6800 (3) Master of Engr Project

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Specialized Courses

ASEN 6849 (1-6) Independent Study

Studies special projects agreed upon by student and instructor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Specialized Courses

ASEN 6949 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Specialized Courses

ASEN 6950 (1-6) Master's Thesis

Additional Information: Departmental Category: Specialized Courses

ASEN 8990 (1-10) Doctoral Thesis

Additional Information: Departmental Category: Specialized Courses

Air Force Aerospace Studies - ROTC (AIRR)

Courses

AIRR 1010 (1) Foundations of the United States Air Force 1

One 1-hour lecture and one 2-hour lab per week. Introduces students to the U.S. Air Force and the USAF officer profession. Uses instructor lectures, films and videos, and group activities to examine Air Force issues, officership qualities, and military customs and courtesies. Emphasizes the communication skills necessary for an Air Force officer.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 1020 (1) Foundations of the United States Air Force 2

One 1-hour lecture and one 2-hour lab per week. A continuation of AIRR 1010.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 2010 (1) The Evolution of USAF Air and Space Power 1

One 1-hour lecture and one 2-hour lab per week. Studies air power from balloons and dirigibles through the jet age and historically reviews air power employment in military and nonmilitary operations in support of national objectives. Looks at the evolution of air power concepts and doctrine and introduces the development of communicative skills.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 2020 (1) The Evolution of USAF Air and Space Power 2

One 1-hour lecture and one 2-hour lab per week. A continuation of AIRR 2010.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 3010 (3) Air Force Leadership Studies I

Two 1 1/2-hour seminars plus one 2-hour lab per week. Provides an integrated management course emphasizing concepts and skills required by the successful manager and leader. Includes individual motivational and behavioral processes, leadership, communication, and group dynamics while providing foundation for the development of the junior officer's professional skills (officership). Emphasizes decision making and use of analytic aids in planning, organizing and controlling in a changing environment. Discusses organizational and personal values (ethics), management of change, organizational power, politics, managerial strategy, and tactics within the context of military organization. Uses actual Air Force case studies throughout the course to enhance the learning and communication process.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 3020 (3) Air Force Leadership Studies II

Two 1 1/2-hour seminars and one 2-hour lab per week. Continuation of AIRR 3010. Emphasizes basic managerial processes while employing group discussions, case studies, and role playing as learning devices. Continues to emphasize the development of communicative skills.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 4010 (3) National Security Affairs/Preparation for Active Duty

Two 1 1/2-hour seminars and one 2-hour lab per week. Studies U.S. national security policy which examines the formulation, organization, and implementation of national security policy; context of national security; evolution of strategy; management of conflict; and civil-military interaction. Also includes blocks of instruction on the military profession/officership, the military justice system, and communicative skills. Provides future Air Force officers with the background of U.S. national security policy so they can effectively function in today's Air Force.

Additional Information: Departmental Category: Air Force Aerospace Studies

AIRR 4020 (3) National Security Forces in Contemporary American Society 2

Two 1 1/2-hour seminars and one 2-hour lab per week. A continuation of AIRR 4010. Includes defense strategy conflict management, formulation/implementation of U.S. defense policy, and organizational factors and case studies in policy making, military law, uniform code of military justice, and communication skills.

Additional Information: Departmental Category: Air Force Aerospace Studies

Anthropology (ANTH)

Courses

ANTH 1030 (3) Principles of Anthropology 1

Evolution of humanity and culture from beginnings through early metal ages. Covers human evolution, race, prehistory, and rise of early civilizations. This course is taught through Continuing Education.

Additional Information: MAPS Course: Social Science

ANTH 1040 (3) Principles of Anthropology 2

Surveys the world's major culture areas. Covers components of culture, such as subsistence, social organization, religion, and language. This course is taught through Continuing Education.

Additional Information: MAPS Course: Social Science

ANTH 1100 (3) Exploring a Non-Western Culture: The Tamils

Surveys the social and economic patterns, ideas and values, and aesthetic achievements of the Tamils, a Hindu people who live in South India and Sri Lanka.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asia Content

ANTH 1105 (3) Exploring a Non-Western Culture: Tibet

Introduction to Tibetan culture, history, religion, and society from an anthropological perspective, including traditional as well as contemporary dimensions. Topics will include Tibetan Buddhism, politics, nomadism, gender, refugee issues, and the global Tibetan diaspora, all framed within the larger methods and concepts of cultural anthropology.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asia Content

ANTH 1115 (3) The Caribbean in Post-Colonial Perspective

Introduces the student to the varied peoples and cultures in the Caribbean region, emphasizing the historical, colonial, and contemporary political-economic contexts of their social structure and cultural patterns.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1120 (3) Exploring a Non-Western Culture: Hopi and Navajo

Explores two American Indian cultures, Hopi and Navajo and cultural interrelationships from the prehistoric through the contemporary period, using an integrated, holistic and humanistic viewpoint.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 1123

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1135 (3) Exploring Cultural Diversity

Examines the geography, kinship, politics and religious values of a various cultures in historical and contemporary context through an anthropological perspective. Check with department for semester offerings.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1140 (3) Exploring a Non-Western Culture: The Maya

Explores the culture of the Maya of Central America, emphasizing their material adaptations, social organizations, ideals and values, and artistic achievements in the past and the present.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1145 (3) Exploring a Non-Western Culture: The Aztecs

Explores the culture of the Aztec people of Central Mexico: their subsistence, society, religion, and achievements, as well as the impact of the Aztec empire in Mesoamerica. Also reviews the clash of a non-western society with the western world with the arrival of the Spanish conquistadors.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1150 (3) Exploring a Non-Western Culture: Regional Cultures of Africa

Explores a small number of cultures in a specific sub-region of Africa from an integrated holistic viewpoint, emphasizing material adaptations, social patterns, ideas and values, and aesthetic achievements.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1170 (3) Exploring Culture and Gender through Film

Explores the concepts of culture and gender from an anthropological perspective, using films and other media, as well as written texts.

By analyzing media about other ways of life, students will learn the basic concepts of cultural anthropology and be able to apply them to any society. In addition, students will learn to think critically about documentary and ethnographic media.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 1180 (3) Maritime People: Fishers and Seafarers

Explores important milestones in the development of human societies and cultures that live from the sea. Emphasizes the evolution of maritime adaptations associated with fishing and seafaring from more than 10,000 years ago through the present.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 1190 (3) Origins of Ancient Civilizations

Examines origins of the world's first civilizations in Mesopotamia, Egypt, the Indus Valley, Mesoamerica, and the Andes. Covers archaeology of ancient cities, trade, economy, politics, warfare, religion, and ideology. Seeks insights into general processes of cultural evolution.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 1200 (3) Culture and Power

Compares contemporary sociopolitical systems across cultures, from non-Western tribal groups to modern states. Introduces students to anthropological approaches for understanding and analyzing political forces, processes, and institutions that affect cultures such as colonialism, warfare, violence, ethnicity, migration, and globalization.

Additional Information: Arts Sci Core Curr: Contemporary Societies

ANTH 2010 (3) Introduction to Biological Anthropology 1

Detailed consideration of human biology, the place of humans in the animal kingdom, primate ecology and fossil evidence for human evolution. Required for ANTH majors.

Additional Information: GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Natural Science

ANTH 2020 (3) Introduction to Biological Anthropology 2

Continuation of ANTH 2010. Emphasizes genetics, human variation, and microevolution.

Recommended: Prerequisite ANTH 2010.

Additional Information: GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

ANTH 2030 (1) Laboratory in Biological Anthropology 1

Lab in human osteology and musculoskeletal system emphasizing comparative primate morphology, adaptation, and the fossil record documenting the natural history of primates. Meets the MAPS requirement for natural science: lab, when taken with ANTH 2010.

Recommended: Corequisite ANTH 2010.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

ANTH 2040 (1) Laboratory in Biological Anthropology 2

Experiments and hands-on exercises designed to enhance understanding of the principles and concepts presented in ANTH 2020. One two-hour class per week.

Recommended: Corequisite ANTH 2020.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

ANTH 2070 (3) Bones, Bodies, and Disease

Studies the human skeleton and introduces techniques used to evaluate demographic variables. Applies techniques through evaluation of photographic images of an excellently preserved mummified skeletal population from ancient Nubia to reconstruct prehistoric patterns of adaptation and biocultural evolution. Offered through Continuing Education only.

Recommended: Prerequisite ANTH 2010.

ANTH 2100 (3) Introduction to Cultural Anthropology

Covers current theories in cultural anthropology and discusses the nature of field work. Explores major schools of thought and ethnographic fieldwork in a range of cultures studied by anthropologists. Required for Anthropology majors.

Additional Information: Arts Sci Core Curr: Human Diversity

ANTH 2200 (3) The Archaeology of Human History

Where do we come from? This course provides a brief introduction to the practice of archaeology and then emphasizes the evidence for major events/transitions in human history over the last 2.5 million years. Required for ANTH majors.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 2210 (1) Laboratory Course in Archaeological Methods

Studies analytical methods in archaeological research including those employed both in the field and in the laboratory. Deals with practical exercises illustrating many of the theoretical principles covered in ANTH 2200.

Recommended: Corequisite ANTH 2200.

ANTH 3000 (3) Primate Behavior

Surveys naturalistic primate behavior. Emphasizes social behavior, behavioral ecology, and evolution as they lead to an understanding of human behavior.

Requisites: Requires a prerequisite course of ANTH 2010 or EBIO 1220 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ANTH 3005 (3) Dogs, Wolves and Human Evolution

Domestication of dogs from wolves started many tens of thousands of years ago. Explores the domestication process, wild wolf behavior, dog behavior, genetics of dog breeding, the cultural significance of dogs, the complexity of human-wolf interactions in North America and Europe and dog cognition in a larger comparative framework, including chimpanzees and other primates.

Requisites: Requires a prerequisite course of ANTH 2010 or EBIO 1210 (minimum grade C-).

ANTH 3009 (3) Modern Issues, Ancient Times

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly ANTH 2009.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 3009

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Historical Context

ANTH 3010 (3) The Human Animal

Identifies genetic, anatomical, physiological, social, and behavioral characteristics humans share with other mammals and primates. Explores how these characteristics are influenced by modern culture.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2010.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ANTH 3100 (3) Africa: Peoples and Societies in Change

Examines culture and politics in Africa through works by anthropologists and historians, as well as novels, films, and journalistic accounts. Special attention is devoted to the ways in which various African cultures have creatively and resiliently responded to the slave trade, European colonialism, and post-colonialism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3110 (3) Ethnography of Mexico and Central America

A broad overview, focusing on Mexico and Guatemala. Major topics include ethnohistory, indigenous and mestizo peoples, and contemporary problems and issues.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3160 (3) Peoples of the South Pacific

Surveys traditional island cultures and contemporary changes in the Pacific, focusing on how the Pacific Islands were first settled, some of the great anthropologists who studied the islanders, and how current environmental changes, such as global warming, threaten the future existence of the islands.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3170 (3) America: An Anthropological Perspective

Historical and contemporary aspects of American life are considered from an anthropological perspective.

Additional Information: Arts Sci Core Curr: United States Context

ANTH 3180 (3) Gender, Culture, and Sexuality

Focuses on gender, that is, the making of men and women, and how gender is culturally constructed in different societies. Gender describes many areas of behavior, feelings, thoughts, and fantasies that cannot be understood as primarily biologically produced. Sexuality and sexual systems are sometimes viewed as products of particular gendering practices, but recent theories suggest that sexual systems themselves constitute gender.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 3300 (3) Elements of Religion

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3301

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 3760 (3) Exploring Culture and Media in Southeast Asia

Introduces students to the ethnographic method and critical media practices through immersion in the cultural politics of Indonesia. Students will learn to conduct ethnographic research and to use media-making as a research method. Students will learn the ethnography of Southeast Asia by focusing on the cultural diversity of Indonesia, with special attention to religious and political issues among marginalized groups.

Repeatable: Repeatable for up to 9.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Human Diversity

ANTH 4000 (3) Quantitative Methods in Anthropology

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5000

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ANTH 2010 and ANTH 2020.

ANTH 4020 (3-6) Explorations in Anthropology

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5045 and MUSM 5045

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Anthropology

ANTH 4050 (3) Anthropology of Jews and Judaism

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4050

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4060 (3) Nutrition and Anthropology

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5060

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ANTH 2010 and ANTH 2020 or EBIO 1210 and EBIO 1220 or EBIO 1030 and EBIO 1040.

ANTH 4070 (3) Methods in Biological Anthropology

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5070

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ANTH 2010 and ANTH 2020 and ANTH 2030 and ANTH 2040 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

ANTH 4110 (3) Human Evolutionary Biology

Detailed consideration of the fossil evidence for human evolution. Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4120 (3) Advanced Biological Anthropology

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5120

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2010 or ANTH 2020 or EBIO 1210 or EBIO 1220.

ANTH 4125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5125

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

ANTH 4129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5129 and ARTH 4129 and CLAS 4129 and CLAS 5129

ANTH 4130 (3) Advanced Osteology

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5130

Recommended: Prerequisites ANTH 2010 and ANTH 2020 and ANTH 4000 and students with 57-180 credits (Juniors or Seniors).

ANTH 4160 (3) Early Hominin Paleocology

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5160

Grading Basis: Letter Grade

ANTH 4170 (3) Primate Evolutionary Biology

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5170

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2010 or EBIO 1210.

ANTH 4180 (3) Anthropological Perspectives: Contemporary Issues

Students read, discuss, and write critical evaluations of contemporary publications in anthropology. Identifies basic themes that inform major anthropological perspectives. Students then bring these perspectives to bear on issues currently facing the human species.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4210 (3) Southwestern Archaeology

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5210

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4220 (3) From Olmec to Aztec: The Archaeology of Mexico

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5220

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4224 (3) Archaeology of the Maya and Their Neighbors

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5224

Recommended: Prerequisite ANTH 2200.

ANTH 4240 (3) Geoarchaeology

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5240

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4270 (3) Plains Archaeology

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5270

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4330 (3) Human Ecology: Archaeological Aspects

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5330

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4340 (3) Archaeological Method and Theory

Surveys archaeological theories and methods within the context of the history of archaeology. Includes archaeological approaches to data recovery, analysis, and interpretation as well as an overview of cultural resources management and ethical issues in contemporary archaeology.

Recommended: Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

ANTH 4350 (2-6) Archaeological Field and Laboratory Research

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5350

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ANTH 2200 and students with 57-180 credits (Juniors or Seniors).

ANTH 4380 (3) Lithic Analysis and Replication

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5380

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4390 (3) Research Methods in Archaeology I

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5390

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2200.

ANTH 4470 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5470 and MUSM 4912 and MUSM 5912

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

ANTH 4500 (3) Cross-Cultural Aspects of Socioeconomic Development

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5500

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4505 (3) Globalization and Transnational Culture

Covers the historical foundations for contemporary global change, addressing colonialism, global outsourcing, and cultural imperialism, with a particular emphasis on gender, class, and consumerism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4525 (3) Global Islams

Examines the historical formation of Islam in Indonesia and Southeast Asia so as to situate contemporary Islamic practices in a global context.

Recommended: Prerequisite ANTH 2100.

ANTH 4530 (3) Theoretical Foundations of Sociocultural Anthropology

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5530

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4570 (3) Anthropology of Fishing

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5570

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4580 (3) The Holocaust: An Anthropological Perspective

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4580

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ANTH 4610 (3) Medical Anthropology

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5610

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4620 (3) Nationalism and Cultural Citizenship

Explores the nature of ethnic conflict, nationalism, and cultural citizenship in different contexts, including the United States. Is the nation-state dead? What effect do extranational and transnational organizations/institutions (e.g., European Union) have on the development of nationalism? Through the exploration of contemporary theory and case studies, this class will address these important contemporary concerns.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4630 (3) Nomadic Peoples of East Africa

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5630

Recommended: Prerequisite students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

ANTH 4690 (3-6) Anthropology of Tibet

Explores the culture of Tibet in both historical and thematic manners, considering the long-term development of Tibetan cultural practices and institutions as well as many of the abrupt changes introduced to Tibet in the 20th century. Topics covered include region, politics, gender, warfare, poetry and literature, and life under Chinese rule and as refugees around the world.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Anthropology (ANTH) majors only.

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4710 (3) Departmental Honors in Anthropology 1

Course work built around theme of research design as a means of integrating previous training in the field of anthropology as well as providing an opportunity to perform creative scientific investigations. Prepares students to write an honors thesis in ANTH 4720. Required of students doing Anthropology departmental honors.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sciences Honors Course

ANTH 4720 (3) Departmental Honors in Anthropology 2

Continuation of ANTH 4710.

Recommended: Prerequisite ANTH 4710.

Additional Information: Arts Sciences Honors Course

ANTH 4730 (3) Latin American Politics and Culture through Film and Text

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5730

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4735 (3) Contemporary Cuban Culture: Race, Gender and Power

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5735

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Letter Grade

ANTH 4740 (3) Peoples and Cultures of Brazil

Thematically surveys theoretical and ethnographic issues that have been important in understanding Brazil. Read and write critically about textual and visual representations of Brazil presented in the course.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ANTH 2100 and three or more cultural anthropology courses.

ANTH 4745 (3) Science, Technology and Society

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5745

Grading Basis: Letter Grade

ANTH 4750 (3) Culture and Society in South Asia

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5750

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4755 (3) Cultures of Expertise: Science, Power and Knowledge

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5755

Grading Basis: Letter Grade

ANTH 4760 (3) Ethnography of Southeast Asia and Indonesia

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5760

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

Additional Information: Departmental Category: Asia Content

ANTH 4770 (3) Anthropology of Tourism

Introduces students to anthropological theories on tourism and considers those theories in the contexts of the varied sites and forms of tourism practiced around the world today. We will ask: why do people tour? Where do they go? And most centrally: how do the hosts to tourism feel about these outside visitors? Having been exposed to questions of globalization, development, belonging, race, gender, and desire, students will then be asked to reflect upon and theorize their own touristic experiences.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ANTH 2100.

ANTH 4800 (3) Language and Culture

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

Equivalent - Duplicate Degree Credit Not Granted: LING 4800

Recommended: Prerequisites ANTH 2100 or LING 1000 or LING 2400 and students with 57-180 credits (Junior or Senior) only.

ANTH 4840 (1-8) Independent Study

For upper-division undergraduate students.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

ANTH 4910 (1-3) Teaching Anthropology

Practicum by special arrangement only. Students learn to teach anthropology by serving as recitation leaders or tutors in introductory courses or as small group leaders in advanced courses.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

ANTH 4930 (1-6) Anthropology Internship

Provides academically supervised opportunities for junior and senior anthropology majors to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 5930

Repeatable: Repeatable for up to 9.00 total credit hours.

Recommended: Prerequisites ANTH 2010 and ANTH 2100 and ANTH 2200 and students with 57-180 credits (Junior or Senior) Anthropology majors, with a minimum 3.25 GPA.

ANTH 5000 (3) Quantitative Methods in Anthropology

Surveys ways of deriving meaning from anthropological data by numerical means, including but not confined to basic statistical procedures.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4000

Requisites: Restricted to graduate students only.

ANTH 5020 (3) Explorations in Anthropology

Special topics in cultural and physical anthropology, as well as archaeology. Check with the department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ANTH 5045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4045 and MUSM 5045

Requisites: Restricted to graduate students only.

ANTH 5060 (3) Nutrition and Anthropology

Overview of the evolution of human diet and ecological and cultural factors shaping modern diets. Introduces fundamentals of nutrition and analysis of nutritional status. Analyzes ecological, social, and cultural factors leading to hunger and undernutrition, as well as biological and behavioral consequences of undernutrition.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4060

Requisites: Restricted to graduate students only.

ANTH 5070 (3) Methods in Biological Anthropology

Provides laboratory-based research experience in selected areas of biological anthropology. Research designs, methods and applications will be used to develop research skills. Students will read original research papers and carry out a research project of their own design. Area of emphasis within biological anthropology will depend on instructor.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4070

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 5110 (3) Human Evolutionary Biology

Detailed consideration of the fossil evidence for human evolution.

Covers the discovery of important fossils and interpretations; descriptive information about the fossils; and data and theory from Pleistocene studies relating to ecology, ecological and behavioral data on modern apes and molecular studies that have bearing on the study of human evolution.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4110

ANTH 5120 (3) Advanced Biological Anthropology

Selected topics in physical anthropology emphasizing faculty specialties. Topics may include population genetics and its application to understanding modern human diversity, human population biology, and primate ecology and evolution. Check with department for semester offerings.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4120

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ANTH 5125 (3) Evolution and the Human Life Cycle: A Primate Life History Perspective

Surveys primate biology, behavior and ecology using a life history approach. Using a comparative approach, explores life history as mammals, as primates and as humans by focusing on evolutionary decisions that occur during different life stages.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4125

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ANTH 5129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4129 and ARTH 4129 and CLAS 4129 and CLAS 5129

ANTH 5130 (3) Advanced Osteology

Detailed study of the human skeleton with special attention to health and demographic conditions in prehistoric cultures and the evaluation of physical characteristics and genetic relationships of prehistoric populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4130

ANTH 5150 (3) Human Ecology: Biological Aspects

Discusses role of human populations in local ecosystems, factors affecting population growth, and human adaptability to environmental stress. Detailed consideration of case studies of small-scale societies in different ecosystems.

ANTH 5160 (3) Early Hominin Paleoecology

Explores current thinking about the diets, environments and lives of early human ancestors and their close kin. Strong emphasis on the methods used to construct such knowledge.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4160

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ANTH 5170 (3) Primate Evolutionary Biology

Focuses on the fossil record of primates excluding the Hominini). Special emphasis is placed on delineating the origins of the order Primates, the origins of the primate suborders Strepsirhini and Haplorhini and the adaptations of extinct primates in light of our understanding of the modern primate adaptive radiations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4170

ANTH 5210 (3) Southwestern Archaeology

Explores the prehistory of the American Southwest from the earliest entry of humans into the area to the Spanish entrada. Focuses on important themes in cultural development: the adoption of agricultural strategies, sedentism, population aggregation, population movement, and social complexity.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4210

ANTH 5220 (3) From Olmec to Aztec: The Archaeology of Mexico

Examines the archaeology of Mexico from the initial peopling of the Americas to the Spanish conquest of the Aztec empire. Studies origins of complex societies; ancient Mexican cities, states and empires; religion and politics; trade and interaction; ecology and economy; and social organization.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4220

Requisites: Restricted to graduate students only.

ANTH 5224 (3) Archaeology of the Maya and Their Neighbors

Begins with the environment and describes the earliest inhabitants and the Olmec civilization, then shifts to the earliest Maya and the emergence and collapse of classic Maya civilization. Compares and contrasts the societies of lower Central America.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4224

Requisites: Restricted to graduate students only.

ANTH 5240 (3) Geoarchaeology

Applies geological principles and instruments to help solve archaeological problems. Focuses on site formation processes, soils, stratigraphy, environments, dating, remote sensing and geophysical exploration. Environmental and ethical considerations are included.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4240

Requisites: Restricted to graduate students only.

ANTH 5270 (3) Plains Archaeology

Archaeological evidence for Native American ways of life on the North American Great Plains from the initial peopling of the region into the 19th century.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4270

ANTH 5330 (3) Human Ecology: Archaeological Aspects

Surveys archaeological approaches to ecology, economy and landscape: glaciation, geomorphology and other physical processes creating and affecting sites and regions; environmental reconstruction; theories of human-environment interaction; landscape formation by forager, agricultural and complex societies; and ideologically structured landscapes.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4330

Requisites: Restricted to graduate students only.

ANTH 5345 (3) Archaeological Theory

Provides an advanced introduction to the history of archaeological theory from the late 19th century to the present. Topics include culture history, cultural evolution, systems ecology, behavioral archaeology, analogy and middle range theory, collective action, ecology, agency, practice, gender, identity, landscape, epistemology, materiality and memory.

Requisites: Restricted to graduate students only.

ANTH 5350 (2-6) Archaeological Field and Laboratory Research

Students participate in archaeological field research or conduct laboratory analysis of archaeological materials and data. Students work with faculty on archaeological research projects with a field or lab focus, depending on the project undertaken.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4350

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 5380 (3) Lithic Analysis and Replication

Uses diversity of approaches to the analysis of ancient stone tools, including fracture mechanics, lithic technology, materials, heat treatment and functional analysis. Percussion and pressure-flaking experiments are performed.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4380

Requisites: Restricted to graduate students only.

ANTH 5390 (3) Research Methods in Archaeology 1

Method and theory of archaeology, emphasizing the interpretation of materials and data and the relationship of archaeology to other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4390

Requisites: Restricted to graduate students only.

ANTH 5400 (3) Research Methods in Archaeology 2

Focuses on the design of research including constructing empirical arguments and testing them, data gathering, site formation processes, field strategies (archival resources, mapping, field survey, surface collecting/recording, excavation and preliminary analysis) and artifact analysis as it relates to research design.

ANTH 5460 (3) Archaeology and Contemporary Society

Explores the intellectual climate in which archaeology is practiced and how it influences archaeological research and reconstruction, laws, regulations, and ethical issues. Explores public use of and engagement with archaeology.

Requisites: Restricted to graduate students only.

ANTH 5470 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4470 and

MUSM 4912 and MUSM 5912

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

ANTH 5500 (3) Cross-Cultural Aspects of Socioeconomic Development

Examines goals of international agencies that support development in underdeveloped countries. Anthropological perspective is provided for such issues as urban planning, health care and delivery, population control, rural development and land reform.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4500

Requisites: Restricted to graduate students only.

ANTH 5530 (3) Theoretical Foundations of Sociocultural Anthropology

Critically examines the pivotal schools of 20th century social theory that have shaped modern sociocultural anthropology, including the ideas of cultural evolutionism, Marxism, Durkheim, Weber, Freud, structuralism, postmodernism and contemporary anthropological approaches. Includes primary readings and seminar-style discussion.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4530

Requisites: Restricted to graduate students only.

ANTH 5570 (3) Anthropology of Fishing

Examines fishing methods, peoples, societies and cultures, emphasizing anthropology's role in shaping fisheries management and development policy.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4570

Requisites: Restricted to graduate students only.

ANTH 5610 (3) Medical Anthropology

Examines health, illness, disease and treatment across a diversity of cases, all of which involve political economic inequalities, individual and collective experiences of medical systems and the historical and contemporary treatment of distinct populations. A demanding upper-level cultural anthropology course in the field of Medical Anthropology, a subfield of cultural anthropology, designed for advanced undergraduate students and early graduate students with an emphasis on the intersections of science, medicine and populations.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4610

ANTH 5630 (3) Nomadic Peoples of East Africa

Examines the issues of current concern in the study of East African pastoral peoples. First half of the course is devoted to historical perspectives and the second half explores the transition from subsistence to market oriented economies.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4630

Requisites: Restricted to graduate students only.

ANTH 5730 (3) Latin American Politics and Culture through Film and Text

Introduces students to the political cultures and societies of Latin America. Through historical and ethnographic text and documentary and non-documentary cinema, this course will explore class relations, ideology and resistance from the conquest to the present.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4730

ANTH 5735 (3) Contemporary Cuban Culture: Race, Gender and Power

Ground students' understanding of contemporary Cuba within the global context. How do those outside the island imagine Cuba and why? What are the realities? In a world of U.S. dominated globalization, only recently have we relaxed a forceful economical blockade on the island: what does the U.S. mean in the Cuban imaginary, both in the past and present? To attend to global processes as they affect local (Cuban) experience, texts from anthropology, history, policy, literature, film and music will be drawn upon. Students will learn how long-standing patterns regarding race, color, class and gender relations have evolved into the socialist and now the "post-socialist" context.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4735

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ANTH 5745 (3) Science, Technology and Society

Explores the cultural work of science and technology in contemporary societies. The course will focus on anthropological studies of technoscientific works ranging from high-energy particle physics and marine biology to hackathons and space exploration. Discussion topics include the relationship between science, technology and political power; scientific controversies; paradigm shifts and scientific revolutions; and ideas of objectivity, representation and abstraction.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4745

Grading Basis: Letter Grade

ANTH 5750 (3) Culture and Society in South Asia

Intensive analysis of major issues in anthropological research on South Asia (India, Pakistan, Bangladesh, Nepal and Sri Lanka), including kinship, gender, marriage, caste system, religion and ritual, ethnic conflict and social change.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4750

Additional Information: Departmental Category: Asia Content

ANTH 5755 (3) Cultures of Expertise: Science, Power and Knowledge

Examines the expertise as a cultural category. Students will consider the historical and cultural contexts of various forms of expertise and the social roles of experts from car mechanics to civil engineers, doctors and scientists. Students will be given opportunities to reflect analytically on their own experiences with increasingly specialized education as they develop "professional vision" in their chosen fields.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4755

Grading Basis: Letter Grade

ANTH 5760 (3) Ethnography of Southeast Asia and Indonesia

Introduces the historical, political, and cultural dimensions of Southeast Asia, focusing primarily on Malaysia, the Philippines, Singapore and Indonesia, with some coverage of mainland Southeast Asia.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4760

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Asia Content

ANTH 5770 (3) Core Course---Archaeology

Provides a graduate-level overview of analytic issues relevant to all phases of archaeological research and of the diversity of theoretical perspectives within the field as a whole. Course is required for all first-year graduate students in anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5780 (3) Core Course-Cultural Anthropology

Provides an intense, graduate-level introduction to the discipline of cultural anthropology, with an emphasis upon critically assessing those methods, theories, and works that have shaped the field from the 19th century to the present time. Required of all first-year graduate students in anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5785 (3) Advanced Seminar in Cultural Anthropology

Details the history of theory and practice in contemporary cultural anthropology, considering the development of major theoretical schools of thought and the integration of general social theory within anthropology. Required of masters students in cultural anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5790 (3) Core Course---Biological Anthropology

Discusses how biological anthropologists use evidence and concepts from evolutionary theory, human biology, and ecology to understand the evolution, diversification, and adaptation of human populations. Required of all first-year graduate students in anthropology.

Requisites: Restricted to Anthropology (ANTH) graduate students only.

ANTH 5795 (3) Proseminar in Anthropology

Introduces incoming first-year graduate students to the history and current state of scholarship in anthropology from across the subdisciplines, through introduction to the research of individual faculty in the department. Required of all incoming graduate students.

Requisites: Restricted to graduate students only.

ANTH 5840 (1-6) Guided Study

Directed individual research based on a specific area of specialization.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ANTH 5930 (1-6) Anthropology Internship

Provides academically supervised opportunities graduate students to work in public and private sectors on projects related to students' career goals. Relates classroom theory to practice. Requires at least 48 hours on the job per credit hour and evidence (paper, employer evaluation, work journal) of significant learning.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4930

Repeatable: Repeatable for up to 9.00 total credit hours.

ANTH 6150 (3) Critical and Theoretical Issues in Museums

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 6150 and HIST 6150 and ARTH 6150

Requisites: Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.

ANTH 6320 (3) Linguistic Anthropology

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

Equivalent - Duplicate Degree Credit Not Granted: LING 6320

Requisites: Restricted to graduate students only.

ANTH 6500 (3) Issues in Indigenous Languages

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

Equivalent - Duplicate Degree Credit Not Granted: LING 6500

Grading Basis: Letter Grade

ANTH 6940 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

ANTH 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 7000 (3) Seminar: Current Research Topics in Cultural Anthropology

Discusses current research and theoretical issues in the field of cultural anthropology.

Requisites: Restricted to graduate students only.

ANTH 7010 (3) Seminar: Contemporary Theory in Cultural Anthropology

Addresses current theoretical perspectives in cultural anthropology and controversies surrounding them. Discusses science, history, interpretation, and postmodernism. Includes the relationship between theory and method as well as the production of ethnography.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ANTH 7020 (3) Seminar: Physical Anthropology

In-depth discussion of selected topics in physical anthropology with emphasis on recent research.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ANTH 7030 (3) Seminar: Archaeology

Intensive examination of selected theoretical or methodological topics in archaeology. Topics vary with current research emphasis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ANTH 7140 (3) Seminar: Archaeology of Selected Areas

Considers archaeology of a specified area, either geographical or topical. Areas selected in accordance with current research interests. May be repeated upto 9 total credit hours.

Repeatable: Repeatable for up to 9.00 total credit hours.

ANTH 7300 (3) Seminar: Research Methods in Cultural Anthropology

Repeatable: Repeatable for up to 6.00 total credit hours.

ANTH 7600 (3) Human Ecology: Cultural Aspects

Reviews and critically examines the major theoretical perspectives for understanding the relationship between human social behavior and the environment developed in the social sciences, especially anthropology, over the last 100 years. Formerly ANTH 5600.

ANTH 7620 (3) Seminar: Ethnography and Cultural Theory

Explores how ethnographic writing has evolved over the past century to incorporate different forms of cross-cultural representation and to accommodate new theoretical paradigms. Includes ethnographic authority and reflexivity, as well as embedded theories and blurred genres of cultural research.

ANTH 7840 (1-6) Independent Research

Research aimed at developing a solution to an originally conceived research problem.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ANTH 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the graduate school section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Applied Math (APPM)

Courses

APPM 1235 (4) Pre-Calculus for Engineers

Prepares students for the challenging content and pace of the calculus sequence required for all engineering majors. Covers algebra, trigonometry and selected topics in analytical geometry. Prepares students for the calculus courses offered for engineering students. Requires students to engage in rigorous work sessions as they review topics that they must be comfortable with to pursue engineering course work. Structured to accustom students to the pace and culture of learning encountered in engineering math courses. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor. Formerly GEEN 1235.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1021 or MATH 1150

Requisites: Restricted to College of Engineering or Pre-Engineering Arts and Sciences majors only. Requires or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

APPM 1340 (4) Calculus 1 with Algebra, Part A

Studies selected topics in analytical geometry and calculus: rates of change of functions, limits, derivatives and their applications. This course and APPM 1345 together are equivalent to APPM 1350. The sequence of this course and APPM 1345 is specifically designed for students whose manipulative skills in the techniques of high school algebra and precalculus may be inadequate for APPM 1350. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

APPM 1345 (4) Calculus 1 with Algebra, Part B

Continuation of APPM 1340. Studies selected topics in calculus: derivatives and their applications, integration, differentiation and integration of transcendental functions. Algebraic and trigonometric topics are studied throughout, as needed.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of APPM 1340 (minimum grade C-).

APPM 1350 (4) Calculus 1 for Engineers

Topics in analytical geometry and calculus including limits, rates of change of functions, derivatives and integrals of algebraic and transcendental functions, applications of differentiations and integration. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/or CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr: Quant Reasn Mathmat Skills

APPM 1360 (4) Calculus 2 for Engineers

Continuation of APPM 1350. Focuses on applications of the definite integral, methods of integration, improper integrals, Taylor's theorem, and infinite series.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2300

Requisites: Requires prerequisite course of APPM 1345 or APPM 1350 or MATH 1300 (minimum grade C-).

APPM 2350 (4) Calculus 3 for Engineers

Covers multivariable calculus, vector analysis, and theorems of Gauss, Green, and Stokes.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2400

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 2360 (4) Introduction to Differential Equations with Linear Algebra

Introduces ordinary differential equations, systems of linear equations, matrices, determinants, vector spaces, linear transformations, and systems of linear differential equations.

Equivalent - Duplicate Degree Credit Not Granted: both MATH 2130 and MATH 3430

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 2450 (1) Calculus 3 Computer Lab

Selected topics in analytic geometry and calculus with a focus on symbolic computation using Mathematica.

Requisites: Requires a corequisite course of APPM 2350.

Grading Basis: Pass/Fail

APPM 2460 (1) Differential Equations Computer Lab

Selected topics in differential equations and linear algebra with a focus on symbolic computation using MATLAB.

Requisites: Requires enrollment in a corequisite course of APPM 2360.

Grading Basis: Pass/Fail

APPM 2720 (1-3) Open Topics in Lower Division Applied Mathematics

Provides a vehicle for the development and presentation of new topics that are accessible to lower division Applied Mathematics students. These topics have the potential to be incorporated into the core APPM curriculum.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

Grading Basis: Letter Grade

APPM 2750 (4) Java: Training, Mathematical Algorithms, and Mobile Apps

Preparatory course for Java programming. Provides necessary background for Java language: basic object-oriented concepts, analysis, and design. Learn to create Java applets, applications and mobile apps, create graphic context, and identify the key features of Java foundation classes as well as other Java-related technology. Material is taught in the context of mathematical algorithms from calculus. Department enforced requisite, knowledge of a programming language.

Requisites: Requires prerequisite course of APPM 1350 or MATH 1300 (minimum grade C-).

APPM 3010 (3) Chaos in Dynamical Systems

Introduces undergraduate students to chaotic dynamical systems. Topics include smooth and discrete dynamical systems, bifurcation theory, chaotic attractors, fractals, Lyapunov exponents, synchronization and networks of dynamical systems. Applications to engineering, biology and physics will be discussed.

Requisites: Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

APPM 3050 (3) Scientific Computing in Matlab

Topics covered include: approximations in computing, computer arithmetic, interpolation, matrix computations, nonlinear equations, optimization, and initial-value problems with emphasis on the computational cost, efficiency, and accuracy of algorithms. The problem sets are application-oriented with examples taken from orbital mechanics, physics, genetics, and fluid dynamics.

Requisites: Requires prerequisite course of APPM 2360 or MATH 3430 (minimum grade C-).

APPM 3170 (3) Discrete Applied Mathematics

Introduces students to ideas and techniques from discrete mathematics that are widely used in science and engineering. Mathematical definitions and proofs are emphasized. Topics include formal logic notation, proof methods; set theory, relations; induction, well-ordering; algorithms, growth of functions and complexity; integer congruencies; basic and advanced counting techniques, recurrences and elementary graph theory. Other selected topics may also be covered.

Requisites: Requires a prerequisite or corequisite course of APPM 2350 or APPM 2360 or MATH 2400 (prereq minimum grade C-).

APPM 3310 (3) Matrix Methods and Applications

Introduces linear algebra and matrices with an emphasis on applications, including methods to solve systems of linear algebraic and linear ordinary differential equations. Discusses vector space concepts, decomposition theorems, and eigenvalue problems.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2130 and MATH 2135

Requisites: Requires prerequisite course of APPM 2350 or APPM 2360 or MATH 2400 (minimum grade C-).

APPM 3350 (3) Advanced Engineering Calculus

Extends the treatment of engineering mathematics beyond the topics covered in Calculus 3 and differential equations. Topics include non-dimensionalization, elementary asymptotics and perturbation theory, Reynold's transport theorem and extensions of Leibnitz's rule, as applied to continuum conservation equations, Hamiltonian formulations, Legendre and Laplace transforms, special functions and their orthogonality properties.

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

APPM 3570 (3) Applied Probability

Studies axioms, counting formulas, conditional probability, independence, random variables, continuous and discrete distribution, expectation, joint distributions, moment generating functions, law of large numbers and the central limit theorem.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3810 or MATH 4510

Requisites: Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400 (prereq minimum grade C-).

APPM 4120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5120 and MATH 4120 and MATH 5120

Requisites: Requires a prerequisite course of APPM 3310 or MATH 2130 or MATH 2135 (minimum grade C-).

APPM 4350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems

Reviews ordinary differential equations, including solutions by Fourier series. Physical derivation of the classical linear partial differential equations (heat, wave, and Laplace equations). Solution of these equations via separation of variables, with Fourier series, Fourier integrals, and more general eigenfunction expansions.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5350

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4360 (3) Methods in Applied Mathematics: Complex Variables and Applications

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5360

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4380 (3) Modeling in Applied Mathematics

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5380

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-).

Recommended: Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

APPM 4390 (3) Modeling in Mathematical Biology

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5390

Requisites: Requires prerequisite courses of APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 (all minimum grade C-).

APPM 4440 (3) Undergraduate Applied Analysis 1

Provides a rigorous treatment of topics covered in Calculus 1 and 2. Topics include convergent sequences; continuous functions; differentiable functions; Darboux sums, Riemann sums, and integration; Taylor and power series and sequences of functions.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 (all minimum grade C-) and a prerequisite or corequisite course of APPM 3310 or MATH 2130 or MATH 2135 (prereq minimum grade C-).

APPM 4450 (3) Undergraduate Applied Analysis 2

Continuation of APPM 4440. Study of multidimensional analysis including n-dimensional Euclidean space, continuity and uniform continuity of functions of several variables, differentiation, linear and nonlinear approximation, inverse function and implicit function theorems, and a short introduction to metric spaces.

Requisites: Requires prerequisite course of APPM 4440 or MATH 3001 (minimum grade C-).

APPM 4500 (3) Statistical Collaboration

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5500

Requisites: Requires a prerequisite course of APPM 4520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4505 (2) Advanced Statistical Collaboration

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5505

Requisites: Requires prerequisite course of APPM 4500 or APPM 5500 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4510 (3) Data Assimilation in High Dimensional Dynamical Systems

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5510

Requisites: Requires prerequisite courses of APPM 3310 and APPM 3570 (all minimum grade C-).

Grading Basis: Letter Grade

APPM 4520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5520 and MATH 4520 and MATH 5520

Requisites: Requires prerequisite course of APPM 3570 or MATH 4510 (minimum grade C-).

APPM 4530 (3) Stochastic Analysis for Finance

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5530

Requisites: Requires prerequisite courses of APPM 3570 and APPM 3310 (all minimum grade C-). Requires prerequisite or corequisite course of APPM 4350 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5540 and MATH 4540 and MATH 5540

Requisites: Requires prerequisite course of APPM 4520 or MATH 4520 (minimum grade C-).

APPM 4550 (3) Spatial Statistics

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5550

Requisites: Requires prerequisite course of APPM 4520 or APPM 5520 or MATH 4520 or MATH 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 4560 (3) Markov Processes, Queues, and Monte Carlo Simulations

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5560

Requisites: Requires prerequisite course of APPM 3570 or MATH 4510 (minimum grade C-).

APPM 4570 (3) Statistical Methods

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5570

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 (minimum grade C-).

APPM 4580 (3) Introduction to Statistical Learning

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5580

Requisites: Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-).

APPM 4590 (3) Statistical Modeling

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5590

Requisites: Requires prerequisite course of APPM 4520 or APPM 4570 or MATH 4520 (minimum grade C-).

APPM 4650 (3) Intermediate Numerical Analysis 1

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced prerequisite: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4650

Requisites: Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

APPM 4660 (3) Intermediate Numerical Analysis 2

Continuation of APPM 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations. Department enforced prerequisite: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4660

Requisites: Requires prerequisite course of APPM 4650 or MATH 4650 (minimum grade C-).

APPM 4720 (1-3) Open Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 5720

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APPM 4840 (1-3) Reading and Research in Applied Mathematics

Introduces undergraduate students to the research foci of the Department of Applied Mathematics. Department enforced prerequisite: variable depending on the topic.

Repeatable: Repeatable for up to 9.00 total credit hours.

APPM 4950 (1-3) Seminar in Applied Mathematics

Introduces undergraduate students to the research foci of the program in applied mathematics. It is also designed to be a capstone experience for the program's majors. Department enforced prerequisite: variable depending on the topic.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

APPM 5120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: APPM 2130 or MATH 2135 or MATH 2135.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4120 and MATH 4120 and MATH 5120

Requisites: Restricted to graduate students only.

APPM 5350 (3) Methods in Applied Mathematics: Fourier Series and Boundary Value Problems

Department enforced prerequisite courses: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course: APPM 3310 or MATH 2130 or MATH 2135.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4350

Requisites: Restricted to graduate students only.

APPM 5360 (3) Methods in Applied Mathematics: Complex Variables and Applications

Introduces methods of complex variables, contour integration and theory of residues. Applications include solving partial differential equations by transform methods, Fourier and Laplace transforms and Reimann-Hilbert boundary-value problems, conformal mapping to ideal fluid flow and/or electrostatics. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360 and a prerequisite or corequisite course of APPM 3310 or MATH 3130 or MATH 3135.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4360

Requisites: Restricted to graduate students only.

APPM 5380 (3) Modeling in Applied Mathematics

An exposition of a variety of mathematical models arising in the physical and biological sciences. Students' modeling projects are presented in class. Topics may include: GPS navigation, medical imaging, ocean waves, and computerized facial recognition. Department enforced prerequisites: APPM 2350 or MATH 2400 and APPM 2360.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4380

Requisites: Restricted to graduate students only.

Recommended: Prerequisites APPM 3310 and APPM 4350 and APPM 4650.

APPM 5390 (3) Modeling in Mathematical Biology

Investigates how complex systems in biology can be studied using applied mathematics. Examines several case studies which include topics from microbiology, enzyme reaction kinetics, neuroscience, ecology, epidemiology, physiology and bioengineering. Department enforced prerequisites: APPM 2360 and APPM 3310 or MATH 2130 or MATH 2135 or instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4390

Requisites: Restricted to graduate students only.

APPM 5430 (3) Methods in Applied Mathematics: Applications of Complex Variables

Reviews basic ideas of complex analysis, including solutions of ODEs and PDEs of physical interest via complex analysis; conformal mapping, including Schwarz-Christoffel transformations and generalizations; computational methods; Riemann-Hilbert problems; topics in asymptotic methods. Department enforced prerequisite: APPM 4360 or APPM 5360.

Requisites: Restricted to graduate students only.

APPM 5440 (3) Applied Analysis 1

Discusses the elements of basic real and complex analysis, Banach spaces, L_p spaces and many relevant inequalities. Includes applications of existence and uniqueness of solutions to various types of ordinary differential equations, partial differential equations, and integral equations. Department enforced prerequisites: APPM 4440 and APPM 4450.

Requisites: Restricted to graduate students only.

APPM 5450 (3) Applied Analysis 2

Continuation of APPM 5440. Department enforced prerequisite: APPM 5440.

Requisites: Restricted to graduate students only.

APPM 5460 (3) Methods in Applied Mathematics: Dynamical Systems and Differential Equations

Introduces the theory and applications of dynamical systems through solutions to differential equations. Covers existence and uniqueness theory, local stability properties, qualitative analysis, global phase portraits, perturbation theory and bifurcation theory. Special topics may include Melnikov methods, averaging methods, bifurcations to chaos and Hamiltonian systems. Department enforced prerequisites: APPM 2360 and APPM 3310 and APPM 4440.

Requisites: Restricted to graduate students only.

APPM 5470 (3) Methods of Applied Mathematics: Partial Differential and Integral Equations

Studies properties and solutions of partial differential equations. Covers methods of characteristics, well-posedness, wave, heat and Laplace equations, Green's functions and related integral equations. Department enforced prerequisites: APPM 4350 or MATH 4470 and APPM 4360 or MATH 3450.

Requisites: Restricted to graduate students only.

APPM 5480 (3) Methods of Applied Mathematics: Approximation Methods

Covers asymptotic evaluation of integrals (stationary phase and steepest descent), perturbation methods (regular and singular methods, and inner and outer expansions), multiple scale methods and applications to differential and integral equations. Department enforced prerequisite: APPM 5470.

Requisites: Restricted to graduate students only.

APPM 5500 (3) Statistical Collaboration

Educates and trains students to become effective interdisciplinary collaborators by developing the communication and collaboration skills necessary to apply technical statistics and data science skills to help domain experts answer research questions. Topics include structuring effective meetings and projects; communicating statistics to non-statisticians; using peer feedback, self-reflection and video analysis to improve collaboration skills; creating reproducible statistical workflows; working ethically.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4500

Requisites: Requires a prerequisite course of APPM 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 5505 (2) Advanced Statistical Collaboration

Educates and trains students to become advanced interdisciplinary collaborators by developing and refining the communication, collaboration and technical statistics and data science skills necessary to collaborate with domain experts to answer research questions. Students work on multiple projects. Discussions center on technical skills necessary to solve research problems and video analysis to improve communication and collaboration skills.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4505

Requisites: Requires prerequisite course of APPM 4500 or APPM 5500 (minimum grade C-).

Grading Basis: Letter Grade

APPM 5510 (3) Data Assimilation in High Dimensional Dynamical Systems

Develops and analyzes approximate methods of solving the Bayesian inverse problem for high-dimensional dynamical systems. After briefly reviewing mathematical foundations in probability and statistics, the course covers the Kalman filter, particle filters, variational methods and ensemble Kalman filters. The emphasis is on mathematical formulation and analysis of methods.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4510

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 5520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: one semester calculus-based probability course, such as MATH 4510 or APPM 3570.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4520 and MATH 4520 and MATH 5520

Requisites: Restricted to graduate students only.

APPM 5530 (3) Stochastic Analysis for Finance

Studies mathematical theories and techniques for modeling financial markets. Specific topics include the binomial model, risk neutral pricing, stochastic calculus, connection to partial differential equations and stochastic control theory.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4530

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 5540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: APPM 5520 or MATH 5520.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4540 and MATH 4540 and MATH 5540

Requisites: Restricted to graduate students only.

APPM 5550 (3) Spatial Statistics

Introduces the theory of spatial statistics with applications. Topics include basic theory for continuous stochastic processes, spatial prediction and kriging, simulation, geostatistical methods, likelihood and Bayesian approaches, spectral methods and an overview of modern topics such as nonstationary models, hierarchical modeling, multivariate processes, methods for large datasets and connections to spines.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4550

Requisites: Requires prerequisite course of APPM 4520 or APPM 5520 or MATH 4520 or MATH 5520 (minimum grade C-).

Grading Basis: Letter Grade

APPM 5560 (3) Markov Processes, Queues, and Monte Carlo Simulations

Brief review of conditional probability and expectation followed by a study of Markov chains, both discrete and continuous time, including Poisson point processes. Queuing theory, terminology and single queue systems are studied with some introduction to networks of queues. Uses Monte Carlo simulation of random variables throughout the semester to gain insight into the processes under study.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4560

Requisites: Restricted to graduate students only.

APPM 5570 (3) Statistical Methods

Covers basic statistical concepts with accompanying introduction to the R programming language. Topics include discrete and continuous probability laws, random variables, expectation and variance, central limit theorem, testing hypothesis and confidence intervals, linear regression analysis, simulations for validation of statistical methods and applications of methods in R.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4570

Requisites: Restricted to graduate students only.

APPM 5580 (3) Introduction to Statistical Learning

Consists of applications and methods of statistical learning. Covers multiple linear regression, classification, regularization, splines, tree-based methods, support vector machines and unsupervised learning.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4580

Requisites: Requires prerequisite course of APPM 4570 or APPM 5570 (minimum grade C-). Restricted to graduate students only.

APPM 5590 (3) Statistical Modeling

Introduces methods, theory and applications of statistical models, from linear models (simple and multiple linear regression), to hierarchical linear models. Topics such as estimation, residual diagnostics, goodness of fit, transformations, and various strategies for variable selection and model comparison will be discussed in depth. Examples and exercises will be demonstrated using statistical software. Department enforced prerequisite: APPM 4570 or APPM 4520 or MATH 4520 or instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4590

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 5600 (3) Numerical Analysis 1

Solution of nonlinear algebraic equations, interpolation, integration, approximation, and numerical linear algebra. Department enforced prerequisite: APPM 3310 or MATH 2130 and experience with a scientific programming language.

Requisites: Restricted to graduate students only.

APPM 5610 (3) Numerical Analysis 2

Numerical linear algebra, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: APPM 5600 or MATH 5600.

Requisites: Restricted to graduate students only.

APPM 5720 (1-3) Open Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics that may be incorporated into the core courses in applied mathematics. Department enforced prerequisite: variable, depending on the topic, see instructor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4720

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

APPM 6470 (3) Advanced Partial Differential Equations

Continuation of APPM 5470. Advanced study of the properties and solutions of elliptic, parabolic, and hyperbolic partial differential equations. Topics include the study of Sobolev spaces and variational methods as they relate to PDEs, and other topics as time permits. Department enforced prerequisite: APPM 5470.

Requisites: Restricted to graduate students only.

APPM 6520 (3) Mathematical Statistics

Emphasizes mathematical theory of statistics. Topics include distribution theory, estimation and testing of hypotheses, multivariate analysis, and nonparametric inference, all with emphasis on theory. Department enforced prerequisite: APPM 5520 or MATH 5520.

Requisites: Restricted to graduate students only.

APPM 6550 (3) Introduction to Stochastic Processes

Systematic study of Markov chains and some of the simpler Markov processes including renewal theory, limit theorems for Markov chains, branching processes, queuing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences. Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560 or instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: MATH 6550

Requisites: Restricted to graduate students only.

APPM 6610 (3) Introduction to Numerical Partial Differential Equations

Covers finite difference, finite element, finite volume, pseudo-spectral, and spectral methods for elliptic, parabolic, and hyperbolic partial differential equations. Department enforced prerequisite: APPM 5600.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite APPM 5610 or graduate numerical linear algebra.

APPM 6640 (3) Multigrid Methods

Develops a fundamental understanding of the principles and techniques of the multigrid methodology, which is a widely used numerical approach for solving many problems in such diverse areas as aerodynamics, astrophysics, chemistry, electromagnetics, hydrology, medical imaging, meteorology/oceanography, quantum mechanics, and statistical physics.

Requisites: Restricted to graduate students only.

APPM 6900 (1-6) Independent Study

Introduces graduate students to research foci of the Department of Applied Mathematics.

Requisites: Restricted to graduate students only.

APPM 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

APPM 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

APPM 7100 (3) Mathematical Methods in Dynamical Systems

Covers dynamical systems defined by mappings and differential equations. Hamiltonian mechanics, action-angle variables, results from KAM and bifurcation theory, phase plane analysis, Melnikov theory, strange attractors, chaos, etc.

Requisites: Requires prerequisite course of APPM 5460 (minimum grade D-). Restricted to graduate students only.

APPM 7300 (3) Nonlinear Waves and Integrable Equations

Includes basic results associated with linear dispersive wave systems, first-order nonlinear wave equations, nonlinear dispersive wave equations, solitons, and the methods of the inverse scattering transform. Department enforced prerequisites: APPM 4350 and APPM 4360.

Requisites: Restricted to graduate students only.

APPM 7400 (1-3) Topics in Applied Mathematics

Provides a vehicle for the development and presentation of new topics with the potential of being incorporated into the core courses in applied mathematics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

APPM 7900 (1-3) Independent Study

Introduces graduate students to research foci of the Department of Applied Mathematics.

Requisites: Restricted to graduate students only.

APPM 8000 (1) Colloquium in Applied Mathematics

Introduces graduate students to the major research foci of the Department of Applied Mathematics.

Requisites: Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8100 (1) Seminar in Dynamical Systems

Introduces advanced topics and research in dynamical systems.

Requisites: Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8300 (1-3) Nonlinear Waves Seminar

Introduces the core methods in the analysis of nonlinear partial differential and integral equations or systems to graduate students.

Provides a vehicle for the development, presentation, and corporative research of new topics in PDE and analysis.

Requisites: Requires prerequisite course of APPM 5440 (minimum grade D-). Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8400 (1) Mathematical Biology Seminar

Introduces advanced topics and research in mathematical and computational biology. Instructor consent required.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 8500 (1) Statistics, Optimization and Machine Learning Seminar

Research-level seminar that explores the mathematical foundations of machine learning, in particular how statistics and optimization give rise to well-founded and efficient algorithms.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

APPM 8600 (1) Seminar in Computational Mathematics

Introduces advanced topics and research in computational mathematics.

Requisites: Restricted to Applied Mathematics (APPM) graduate students only.

APPM 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. No more than 10 credit hours may be taken in any one semester.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Arabic (ARAB)

Courses

ARAB 1010 (5) Beginning Arabic 1

Introduces students to speaking, listening, reading, and writing skills in the standard means of communication in the Arab world. This course is proficiency-based. All activities within the course are aimed at placing the student in the context of the native-speaking environment from the very beginning.

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 1011 (3) Introduction to Arab and Islamic Civilizations

Provides an interdisciplinary overview of the cultures of the Arabic-speaking peoples of Southwest Asia and North Africa from the rise of Islam in the 7th century to the present. Readings include historical, religious, literary and cultural texts from both the medieval and modern eras. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 1020 (5) Beginning Arabic 2

Continuation of ARAB 1010.

Requisites: Requires prerequisite course of ARAB 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 2110 (5) Intermediate Arabic 1

Proficiency-based course emphasizes speaking, listening, reading, and writing. Covers a variety of topics. Students give classroom presentations and write short essays in Arabic. Speaking ability is assessed through an oral proficiency interview.

Requisites: Requires prerequisite course of ARAB 1020 (minimum grade C).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign

Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 2120 (5) Intermediate Arabic 2

Continuation of ARAB 2110.

Requisites: Requires prerequisite course of ARAB 2110 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 2231 (3) Love, Loss and Longing in Classical Arabic Literature

Surveys Arabic literature from the sixth through the eighteenth centuries. It offers an introduction to Arabic literature, namely prose and poetry, through its key texts as well as the range of themes and techniques found in this literature, and it lays the groundwork for contextualizing the literature in the framework of other literary traditions. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 2320 (3) The Muslim World, 600-1250

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamic society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2320

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 3110 (3) Advanced Arabic 1

Designed to train students further in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level.

Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

Requisites: Requires prerequisite course of ARAB 2120 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 3120 (3) Advanced Arabic 2

Continues training in the four language skills (writing, speaking, reading, listening/comprehension) at an advanced level. Enables students to acquire a better and broader understanding of Arabic culture and texts drawn from various genres of Arabic letters.

Requisites: Requires prerequisite course of ARAB 3110 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 3230 (3) Islamic Culture and the Iberian Peninsula

Examines Islamic, especially Arab, culture and history as it relates to the Iberian Peninsula from 92 Ah/711 Ce to the present. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 3231 (3) In the Footsteps of Travelers: Travel Writing in Arabic Lit

Offers an excursion into the role and significance of travel and travel writing in Arabic literature in translation. We will read and discuss a range of literary works written by, about, and for travelers. More broadly, this course will offer an opportunity for undergraduates to expand their understanding of literature and the arts. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Arabic Courses in English

Departmental Category: Asia Content

ARAB 3241 (3) Art in Islamic Cultures

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 3241

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Arabic Courses in English

ARAB 3330 (3) The Arabic Novel

Focusing on the origins and development of the novel genre in the Arabic tradition, this course examines both the aesthetic qualities of the genre as an artistic form and the ways that it has depicted and intervened in the modern social, political, and cultural upheavals that have shaped the Arab world in the 20th century. Authors include Najib Mahfuz, Abd al Rahman Munif, Hanan al-Shaykh, and Ghassan Kanafani. Taught in English.

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 3340 (3) Representing Islam

Explores the cultural politics of representations of the Arab and Islamic worlds both with an emphasis on literary representations of the Islamic world in travel narratives and novels from both the West and the Arab world. Examines historical, anthropological, and visual texts to consider how Islam has been narrated in colonial European imaginings about the Islamic world as well as contemporary representations. Taught in English.

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 3350 (3) Narrating the City: Literary Mappings of the Urban Landscape

Examines literary narratives primarily from the Arabic tradition through focusing on the relationship of literature to the development and transformations of cities and urban spaces in the modern period. Begins with readings of 19th century European narratives that chronicle the changing space of the modern city followed by urban narratives from the Arabic literary tradition in order to comparatively examine how "universal" processes of modernization, development, and globalization in the modern world have been narrated. Writers include Mahfouz, Munif, al-Takarli, al-Aswani, Celik, Abu Lughod. Taught in English.

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 3410 (3) Gender, Sexuality and Culture in the Modern Middle East

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing, and constructions of gender and sexuality have been shaped by local, national and international factors. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3410

Grading Basis: Letter Grade

Additional Information: Departmental Category: Arabic Courses in English
Departmental Category: Asia Content

ARAB 4200 (3) Advanced Readings in Arabic

Develops student proficiency and communication in modern standard Arabic at the advanced (4th year) level. Emphasis placed on developing reading comprehension, speaking, and writing skills.

Requisites: Requires prerequisite course of ARAB 3120 (minimum grade C).

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

ARAB 4250 (3) Arabic Media

Designed to provide students with advanced Arabic language skills for use in the media. By negotiating authentic materials in Arabic, students will gain a perspective on global issues in the Arab and Islamic world and will attain a better awareness of Arab and Islamic culture. Department enforced prerequisite: ARAB 3120 (minimum grade C) or equivalent.

Additional Information: Departmental Category: Arabic
Departmental Category: Asia Content

ARAB 4840 (1-3) Independent Study

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Arabic

Departmental Category: Asia Content

Architectural Engineering (AREN)

Courses

AREN 1027 (3) Engineering Drawing

Introduces engineering drawing including sections and dimensioning, print readings, computer 3D, and building information modeling (BIM).

Requisites: Restricted to Engineering Physics (EPEN), Architectural (AREN), General Engineering (GEEN) or Civil (CVEN) Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

AREN 1037 (3) Building Information Modeling

Learn to develop and communicate physical information using three-dimensional graphical systems including Computer-Aided Design (CAD) and Building Information Models (BIM). Learn to dimension and scale physical systems and interpret scaled drawings. Get experience with industry standard software tools (REVIT) used to produce design and construction documents, and apply BIM and CAD tools in a project producing scaled 3-D drawings.

Additional Information: Departmental Category: Miscellaneous

AREN 1316 (1) Introduction to Architectural Engineering

Surveys the broad subject of architectural engineering and professional practices. Includes professional design services, design documents, methods of construction delivery, materials for construction, codes and standards, life safety, professional ethics, structural systems, mechanical systems, electrical systems, and building systems integration.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

AREN 2050 (3) Building Materials and Systems

Covers the broad subject of building materials and systems. Includes a practical approach to assembly details, methods of construction, codes, foundations, steel, concrete, masonry, cladding, doors and windows, interiors, finishes, mechanical, plumbing, electrical, life safety and conveyance. Includes investigation of an existing facility along with a team presentation trends in commercial building construction.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Civil (CVEN) or Architectural (AREN) or GEEN (General) or Applied Mathematics (AMEN) majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 2110 (3) Thermodynamics

Explores fundamental principles of thermodynamics, including first and second law of thermodynamics, thermophysical properties, power and refrigeration cycles, gas mixtures and psychrometrics.

Requisites: Requires a prereq course of PHYS 1110 (min grade C-) and a prereq or coreq course of APPM 1360 or MATH 2300 (min grade C-). Restricted to AREN, CVEN or EVEN, GEEN, AMEN or EVENCVEN Concurrent Degree majors only.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Building Systems Engineering

AREN 2120 (3) Fluid Mechanics and Heat Transfer

Explores fundamental principles of fluid mechanics and heat transfer.

Topics include fluid statics, momentum and energy conservations; laminar and turbulent viscous flows; conduction, convection and radiation heat transfer. Emphasizes topics and problems that are important to Architectural Engineers including flow of fluids in pipes and ducts, heat transfer in buildings and building systems.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400, and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 (all minimum grade C-). Requires corequisite course of APPM 2360. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 2830 (1-3) Special Topics

Supervised study of special topics of interest to students under instructor guidance.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Special Topics

AREN 3010 (3) Mechanical Systems for Buildings

Lecture course on the analysis and design of buildings and their systems to satisfy the requirements for a comfortable and healthy indoor environment. Examines psychometrics, thermal comfort, building heating and cooling loads, fluid flow basics, and HVAC components and systems.

Requisites: Requires prerequisite courses of AREN 2120 or MCEN 3021 and 3022 and AREN 2050 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 3050 (3) Environmental Systems for Buildings 1

Explores operations and architectural design strategies of environmental (climate) control systems in buildings with a focus on sustainability and resource efficiency. Topics include thermal comfort and indoor air quality, building thermal and moisture loads, HVAC equipment and systems and active and passive thermal strategies in buildings.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Program in Environmental Design major or minor students only.

College of Engineering majors are excluded from this course.

Additional Information: Departmental Category: Building Systems Engineering

AREN 3060 (3) Environmental Systems for Buildings 2

Explores operations and architectural design strategies of plumbing, power distribution, renewable electricity generation, illumination, daylighting, acoustical control, vertical transportation, fire protection and telecommunication systems in buildings with a focus on sustainability and resource efficiency.

Requisites: College of Engineering majors are excluded from this course.

Additional Information: Departmental Category: Building Systems Engineering

AREN 3140 (3) Illumination Laboratory

Introduces the measurement of photometric and psychophysical quantities used in lighting. Experience is acquired in using light measurement instruments to evaluate lighting equipment and luminous environments. Taught intermittently.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 3540 (3) Illumination I

Studies the fundamentals of architectural illumination. Introduces and applies basic principles and vocabulary to elementary problems in the lighting of environments for the performance of visual work and the proper interaction with architecture.

Requisites: Requires prerequisite course of CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4010 (3) HVAC System Modeling and Control

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5010

Requisites: Requires prerequisite course of AREN 4110 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4035 (3) Architectural Structures 1

Analyzes basic structural systems. Covers principles of mechanics and mechanical properties of materials and analysis and design of trusses, arches, and cable structures. For nonengineering students; does not apply toward an engineering degree.

Requisites: Requires prerequisite course of PHYS 1110 or PHYS 2010 and APPM 1350 or MATH 1300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

Additional Information: Departmental Category: Structures

AREN 4045 (3) Architectural Structures 2

Analyzes basic structural systems. Covers principles of mechanics as applied to the design of flexural members, columns, continuous beams, and rigid frames. For nonengineering students; does not apply toward an engineering degree.

Requisites: Requires prerequisite course of AREN 4035 (minimum grade C-).

Additional Information: Departmental Category: Structures

AREN 4110 (3) HVAC Design

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5110

Requisites: Requires prerequisite course of AREN 3010 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4130 (3) Optical Design for Illumination and Solid State Lighting

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5130

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4315 (3) Design of Masonry Structures

Covers modern masonry construction; properties and behavior of the reinforced masonry component materials, clay and concrete masonry units, mortar, grout, and steel reinforcement; vertical and lateral load types and intensities; and design of reinforced masonry walls, beams, and columns by working stress and strength design methods.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

AREN 4317 (5) Architectural Engineering Design

Provides a capstone experience to AREN students. Students design a modest commercial building and complete an integrated engineering design of the building systems executed for the conceptual, schematic, and design development phases. Students' teams work on structural, mechanical, electrical/lighting, and construction engineering management design. Each stage produce a professional-quality design document. Faculty and industry mentors participate in the teaching and evaluation of designs.

Requisites: Requires prerequisite courses of ARCH 4010 and AREN 3010 and AREN 3540 and CVEN 3246 and CVEN 3525 and ECEN 3030 (all minimum grade C-).

Additional Information: Departmental Category: Miscellaneous

AREN 4506 (3) Pre-construction Estimating and Scheduling

Integrates project management methods with an emphasis on the techniques used to create bid-day budgets and schedules for architectural and civil engineering projects.

Requisites: Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Architectural (AREN), Civil (CVEN) or General (GEEN) Engineering majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Construction

AREN 4530 (3) Advanced Lighting Design

Intended to help students understand light as a medium in design, begin the formulation of a philosophical perspective for its application, and continue to develop the skills required to design and implement lighting systems. Knowledge from previous lighting classes (Illumination I and Illumination II) is essential to this course.

Requisites: Requires prerequisite courses of AREN 3540 and AREN 4550 (all minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4540 (3) Exterior Lighting Systems

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5540

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Recommended: Prerequisite AREN 4550.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4550 (3) Illumination 2

Applies the principles studied in Illumination 1. Provides further study in architectural lighting design methods. Uses lighting studio work to develop a broad knowledge of lighting equipment, design methods, and their application in a series of practical design problems in modern buildings.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4560 (3) Luminous Radiative Transfer

Teaches fundamentals of radiative exchange as applied to illumination engineering. Describes and uses principal numerical techniques for radiative transfer analysis. Applies techniques to lighting design and analysis. Taught intermittently.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4570 (3) Building Electrical Systems Design 1

Introduces the generation and distribution of electrical power. Focuses on understanding the loads, control, and protection of secondary electrical distribution systems in building. Applies the national electric code to residential and commercial buildings.

Requisites: Requires prerequisite course of ECEN 3030 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4580 (3) Daylighting

Applies the fundamental principles of illumination engineering to architectural daylighting design, exploring the quantitative methods and tools used to develop daylighting designs and evaluate their performance. Topics include solar and sky modeling, luminous radiative transfer, design methods, and controls for integration with electric lighting systems.

Requisites: Requires prerequisite course of AREN 3540 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4590 (3) Computer Graphics in Lighting Engineering

Studies the numerical methods and computer implementation of computer graphics visualization for architectural lighting engineering and design. Implements finite element radiative transfer and ray-tracing in computer programs. Studies the use of computer graphics visualization in lighting analysis. Taught intermittently.

Requisites: Requires prerequisite courses of AREN 3540 and AREN 4560 (minimum grade C-).

Additional Information: Departmental Category: Building Systems Engineering

AREN 4606 (3) Construction Project Execution and Control

Integrates project execution and control techniques for construction scope, cost and schedule. Includes progress measurement, resource planning, earned value methods, productivity, risk management methods and key contract clauses.

Requisites: Requires prerequisite courses of CVEN 3246 and AREN 4506 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Construction

AREN 4830 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Special Topics

AREN 4836 (1-3) Special Topics For Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 30.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

AREN 4837 (3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Additional Information: Departmental Category: Special Topics

AREN 4849 (1-3) Independent Study

Offers an independent, in-depth study, research or design in a selected area of architectural engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

AREN 4890 (3) Sustainable Building Design

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5890

Requisites: Requires a prerequisite course of AREN 3010 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering students only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 4990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method.

Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

Equivalent - Duplicate Degree Credit Not Granted: AREN 5990

Requisites: Requires prerequisite course of AREN 2120 and APPM 2360 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering majors only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5010 (3) HVAC System Modeling and Control

Engineering course devoted to building automation and control systems. Topics include HVAC control technology and strategies, measurement and device technologies, analysis and modeling of dynamic systems, simulation of conventional and advanced control approaches, assessment of control loop performance and hands-on direct digital control (DDC) programming exercises as used in current building control practice.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4010

Recommended: Prerequisite AREN 4140.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5020 (3) Building Energy Audits

Analyzes and measures performance of HVAC systems, envelopes, lighting and hot water systems, and modifications to reduce energy use. Emphasizes existing buildings.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5050 (3) Advanced Solar Design

Predicts performance and analyzes economics of low-temperature, high-temperature, photovoltaic, and other innovative solar systems. Also includes performance prediction methods for solar processes.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 2120.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5070 (3) Thermal Analysis of Buildings

Examines response factors, conduction transfer functions and weighting factors for dynamic analysis of building envelopes. Also studies radiative and convective exchange in buildings, internal gains and infiltration analysis as modeled in hourly simulations.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5080 (3) Computer Simulation of Building Energy Systems

Introduces major simulation programs for analysis of building energy loads and system performance. Focuses on one hourly simulation program to develop capability for analysis of multizone structure.

Requisites: Requires prerequisite course of AREN 4110 or AREN 5110 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5110 (3) HVAC Design

Applies engineering principles to the design of heating, ventilating and air conditioning (HVAC) systems for buildings. Covers HVAC systems description, load estimation, psychometrics, coils and heat exchangers, air and water distribution systems and primary equipment and systems.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4110

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5130 (3) Optical Design for Illumination and Solid State Lighting

Covers the optical design process for illumination-based optics, emphasis on applications in architectural lighting. In-depth coverage of luminaire photometry, lamps, materials, manufacturing methods, product performance requirements. Projects utilize optical design software and include a variety of lamp types including LEDs using both reflector/lens optics.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4130

Recommended: Prerequisite AREN 3540.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5540 (3) Exterior Lighting Systems

Engages students in exploring and solving lighting problems for exterior environments. Provides an understanding of the design criteria and lighting equipment used in three primary exterior applications: parking lots and roadways, floodlighting of buildings, and sports facilities. Taught intermittently.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4540

Recommended: Prerequisites AREN 3540 and AREN 4550.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5890 (3) Sustainable Building Design

Introduces green building design procedure/approach and provides insight into evolving design principles; explores aspects of building thermal/energy performance, indoor/outdoor environmental quality, occupant comfort and climate relevant to building design (structures not covered); emphasizes both comprehensive understanding and practical applications of sustainable building design strategies; applies prevailing simulation tools to assist green building design.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4890

Requisites: Restricted to graduate students only.

Recommended: Prerequisite AREN 3010.

Additional Information: Departmental Category: Building Systems Engineering

AREN 5990 (3) Compu Fluid Dynamics (CFD) Analysis for Built/Natural Envmnts

Explores the fundamentals of simulating/analyzing civil and architectural environments with Computational Fluid Dynamics (CFD) method. Run with two parallel sessions: fundamentals and applications, with fundamental lectures presenting the principles of CFD technologies, and application sessions demonstrating the application of CFD for resolving building and environmental engineering problems (different than MCEN/ASEN) with hands-on exercises.

Equivalent - Duplicate Degree Credit Not Granted: AREN 4990

Requisites: Restricted to graduate students only.

Recommended: Prerequisites AREN 2120 and APPM 2360.

Additional Information: Departmental Category: Building Systems Engineering

AREN 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Building Systems Engineering

AREN 6950 (1-6) Master's Thesis

Additional Information: Departmental Category: Building Systems Engineering

AREN 6960 (1-3) Master's Report

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Building Systems Engineering

AREN 8990 (1-10) Doctoral Thesis

A minimum of 30 credit hours is required.

Additional Information: Departmental Category: Building Systems Engineering

Architecture (ARCH)

Courses

ARCH 4010 (5) Architectural Appreciation and Design

Introduces basic processes and principles of architectural design. Provides a basis for understanding and evaluating architecture.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Architectural Engineering (AREN) majors only.

Art Film Studies (ARTF)

Courses

ARTF 5000 (3) Advanced Digital Postproduction

Explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio and optical effects treatments. Cannot be taken simultaneously with FILM 3400 or FILM 3600.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4000

Requisites: Requires prerequisite courses of FILM 2500 and FILM 3400 or FILM 3600 and FILM 1502 and FILM 2000 or FILM 2300 (all minimum grade (D-)).

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5003 (3) Film and Literature

Explores similarities and differences between literature and film as narrative arts. Studies novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4003

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5004 (3) Topics in Film Theory

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4004 and HUMN 4004

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 3051 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5010 (1-3) Topics in Film Studies-Production

Prepares students for advanced Film Studies production courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4010

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5013 (3) Film, Photography and Modernism

Provides interdisciplinary study of film, photography and modernism, focusing on issues such as dystopia, alienation, sexuality, subjectivity and self-referentiality. Photographs by Stieglitz, Strand, Weston, Evans, Cartier-Bresson, Kertesz and Moholy-Nagy. Films by Dziga-Vertov, Eisenstein, Resnais, Antonioni, Bergman, Bunuel and Bertolucci.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4013

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5021 (3) Directing/Acting for the Camera

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research, and papers required.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4021

Requisites: Restricted to graduate students only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5023 (3) Topics in International Cinema

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4023

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to graduate students only.

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5024 (3) Advanced Research Seminar

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4024

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5030 (3) Visiting Filmmakers Seminar

Examines creative issues in contemporary cinema art. Graduate and advanced undergraduate students explore filmmaking ideas with guest artists within a seminar setting. Filmmakers, videographers and programmers of national and international reputation, with an emphasis on "experimental" practice, interact with graduate and advanced undergraduate students and discuss their work at seminar meetings, public lectures or events.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites FILM 1502 and FILM 4453 or instructor consent required.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5043 (1-3) Topics in Film Studies-Critical Studies

Prepares students for advanced Film Studies critical studies courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4043

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5105 (3) Advanced Screenwriting

Introduces professional screenwriting, in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio. Department enforced prerequisite: approved writing sample.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4105

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5200 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4200 and MCEN 4151 and MCEN 5151

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5400 (3) Digital Post-Production

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4400

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5453 (3) Elective Affinities: Avant-Garde Film and the Arts

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4453

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5500 (3) Cinema Production 2

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production exploring either documentary, experimental, or narrative genres.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4500

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of FILM 3400 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5600 (3) Creative Digital Cinematography

Explores creative approaches to single camera digital cinematography through short projects, discussions and screenings. Relates creative photography and poetic approaches to the digital camera cinema.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4600

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 2000 and FILM 3600 or ARTS 4246 or ARTS 5346 (all minimum grade D-). Restricted to Film Studies (FILM) majors only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5604 (3) Colloquium in Film Aesthetics

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4604

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5610 (3) Image-makers Graduate Seminar

Explores advanced graduate studio work in a seminar setting. Focuses on the development of ideas and activities which advance creative image making.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5717 (1-3) Graduate Studio Critique

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5846 (1-3) Graduate Independent Study-Video

Participate in graduate independent study.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 5857 (1-3) Graduate Independent Study

Participate in graduate independent study.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

ARTF 6959 (1-6) Master's Thesis Film

Preparation, research, writing of critical studies Master's thesis in fulfillment of concurrent BAMA in Film.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTF 5004 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Film Courses

Art History (ARTH)

Courses

ARTH 1300 (3) History of World Art 1

Surveys major art styles from the Paleolithic period through the Renaissance, including European, Asian, and the Pre-Columbian/Islamic world. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 1400 (3) History of World Art 2

Surveys major art styles from about 1600 to the present, including Europe, Asia, the Islamic world, the Americas and Africa. Emphasizes comparison of Western and non-Western visual expressions as evidence of differing cultural orientations.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 1509 (4) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1509

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Arts Sci Core Curr: Historical Context
Departmental Category: Art History

ARTH 1709 (3) Freshmen Seminar: Critical Introduction to Art History

Provides a broad introduction to understanding and appreciating art and art history within a critical lecture seminar and discussion format. The focus of this course is a selected Particularity directed to nonmajors.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 2029 (3) Art and Archaeology of Ancient Egypt

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2029

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art History

ARTH 2039 (3) Greek Art and Archaeology

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture, and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2039

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 2049 (3) Introduction to Roman Art and Architecture

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2049

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 2409 (3) Intro to Asian Art

Designed for those having no previous experience in the study of Asian art. Traces development of sculpture, painting, architecture, and the other visual arts of South Asia, the Far East, and Southeast Asia, with a synopsis of developments from 1453 through the 18th century.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

Departmental Category: Asia Content

ARTH 3009 (3) Critical Thinking in Art History

Through structured discussions, selected readings, and written assignments provides an understanding of how art history has evolved as an academic discipline and how art historians evaluate complex issues of style, form, content, and theory in the visual arts.

Additional Information: Departmental Category: Art History

ARTH 3019 (3) Pompeii and the Cities of Vesuvius

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 3019

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Art History

ARTH 3029 (3) Medieval and Early Modern Visual Culture, A.D. 400 to A.D. 1750

Introduces students to the literature, history, culture and art of Europe and the Mediterranean basin from late antiquity through the early modern period. Interdisciplinary approach to visual culture focuses on uses of sacred religious practices and lay devotion.

Additional Information: Departmental Category: Art History

ARTH 3079 (3) Medieval Art Survey

Surveys the history of Western art from Constantine to around the year 1300, including Carolingian, Ottonian, Anglo-Saxon, Romanesque, and Gothic. Considers "Barbarian," Byzantine, and Islamic influences.

Additional Information: Departmental Category: Art History

ARTH 3109 (3) Art in Contemporary Society

Examines writings by philosophers and art critics as they address the question: What is art for? Readings focus on the 19th and 20th centuries, including current theories and some non-Western theories. Students are encouraged to develop their own responses to the question.

Additional Information: Departmental Category: Art History

ARTH 3209 (3) Art, Culture, and Gender Diversity, 1400--1600: Renaissance Art Out of the Canon

Studies the rising status of painting, sculpture, and architecture in Europe and how Europeans perceived non-Western art during the early modern period. Introduces history of race/ethnicity, gender, and class concerns embodied in the European category visual arts. Emphasizes new methods for interpreting history without imposing Eurocentric viewpoints.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art History

ARTH 3210 (3) The Art of Renaissance Cities and Courts

Surveys the development and spread of humanist culture associated with the modern term "Renaissance Art" from c. 1400-1600, organized by location, artist, and patron. Presents significant works of paintings, sculpture and architecture at a number of major artistic centers including Florence, Rome, Venice, Fontainebleau, and Prague.

Additional Information: Departmental Category: Art History

ARTH 3241 (3) Art in Islam

Offers an overview of art in Islamic cultures. Discusses a range of literary texts and images in order to understand these cultures. Offers an opportunity for undergraduates to expand their understanding of literature and art history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ARAB 3241

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 3329 (3) Art in France: Revolution to 1870

Covers major art movements and theories in France from 1793 to 1870 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

Recommended: Prerequisites ARTH 1300 and second semester sophomore, junior or senior standing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3339 (3) Art in France: 1870-1970

Covers major art movements and theories in France from the Paris Commune through 1970 on location in Paris. Students study ceramics, painting, sculpture, photography and some architecture. Political and cultural events are considered for their influence on art: excavations at Pompeii, colonial expansion in Middle East and Africa, influx of Asian art, exploration of Americas and various technical inventions.

Recommended: Prerequisite ARTH 1300 and second semester sophomore, junior or senior standing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3359 (3) Art in Spain: Goya to 1900

Explores the scope of Goya's works in context of his contemporaries and antecedent, Velazquez; Moorish influences, genre painting costumbrismo, Romanticism and historical narratives are considered in relation to Enlightenment ideals, French Neoclassicism, Romanticism, Orientalism and the Napoleonic invasion. Teaching occurs mostly on site: Alhambra, Prado, Bellas Artes, Palacio Real, Museo de Romanticismo; seminars and tests are in Madrid classrooms.

Recommended: Prerequisite ARTH 1300.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3369 (3) Art in Spain: 1900-1990

Covers Gaudi, Picasso and artists of Modernismo movement as well as Dali are studied in Barcelona; Dada and Surrealism are explored through works of Picasso, Gonzalez, Gris, Varo, Dali, Bunuel and others. Photography and film of Spanish Civil War and thereafter are studied in seminar in Madrid classroom; students experience flamenco performances and Q&A with performers. Tests administered in class.

Recommended: Prerequisite ARTH 1300.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Art History

ARTH 3419 (3) Modern Art Survey

Surveys the loss of beauty in art and discusses whether or not that loss is regrettable. Questions the function and historical meaning of modern and postmodern art: is it all hype and strategic positioning by artists for fame and fortune? Is it serious? Are the fine arts still fine?

Additional Information: Departmental Category: Art History

ARTH 3509 (3) American Art

Surveys American art and material culture from the precolonial era to the present day. Considers cultural and artistic interaction, ethnic expressions, patronage, European and non-Western influences, and the struggle to develop a uniquely American artistic identity.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Art History

ARTH 3519 (3) Modern Architecture, 1780--1960

Introduces the major movements and developments in European and American architecture from Neoclassicism to Postmodernism. Considers the impact of exhibitions, expositions, and vernacular architecture.

Additional Information: Departmental Category: Art History

ARTH 3539 (3) Contemporary Art

Examines contemporary art and theory in the transition from modern to postmodern expression. Discusses painting, sculpture, installations, performance, video, photography, and architecture with attention to historical context and criticism. Considers neoexpressionist, feminist, minority, political, and public art.

Additional Information: Departmental Category: Art History

ARTH 3619 (3) The Arts of China

Surveys Chinese painting, sculpture, architecture, and other arts from neolithic to modern times.

Additional Information: Departmental Category: Art History

Departmental Category: Asia Content

ARTH 3629 (3) The Arts of Japan

Offers an appreciation and chronological development of the arts of Japan. Emphasizes the arts of Shintoism and Buddhism as well as the particular Japanese aesthetic from prehistoric times to the present.

Additional Information: Departmental Category: Art History

Departmental Category: Asia Content

ARTH 3719 (3) History of Media Arts

Surveys the development of technological media both as sources of information and as art. Photography and related media, film, video, holography, and electronic imaging systems are surveyed as art and as technologies, emphasizing major artists, movements, exhibitions, and other productions in the 19th and 20th centuries.

Additional Information: Departmental Category: Art History

ARTH 3729 (3) Foundations in Latin American Art

Examines Latin America's cultural pluralism and art production beginning in pre-Columbian times and following through to the present. Considers the various functions of art as well as the relationship between objects, artists, and the cultures from which they come. Provides students with a broad frame of reference for many historical periods and equips students to evaluate art objects and their cultural contexts.

Additional Information: Departmental Category: Art History

ARTH 3929 (1-3) Special Topics in Art History

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4029 (1) Art History Research Methods

Learn to expertly navigate art scholarship and be prepared to do thesis-level research. An introduction to the vast array of art historical resources and their uses. Explore advanced techniques for searching both online and offline sources of art information. Master the various modes of art historical research, including finding iconographic, historical, or technical information.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5029 and LIBR 4029

Additional Information: Departmental Category: Art History

ARTH 4069 (3) Medieval Manuscripts

Surveys decorated books from late antiquity to the advent of the printing press. Examines the various roles manuscripts played within different medieval communities.

Additional Information: Departmental Category: Art History

ARTH 4089 (3) Romanesque and Gothic Art

Examines major artistic trends in Europe between the years 1000 and 1300, a period that witnessed, among others, the development of gothic cathedrals and the rise of the professional artist. Particular attention will be given to exchange with other cultures.

Additional Information: Departmental Category: Art History

ARTH 4109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5109 and CLAS 4109 and CLAS 5109

Recommended: Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

Additional Information: Departmental Category: Art History

ARTH 4119 (3) Roman Sculpture

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5119 and CLAS 4119 and CLAS 5119

Recommended: Prerequisite ARTH 1300 or CLAS 2049.

Additional Information: Departmental Category: Art History

ARTH 4129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4129 and ANTH 5129 and CLAS 4129 and CLAS 5129

Additional Information: Departmental Category: Art History

ARTH 4139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5139 and CLAS 4139 and CLAS 5139

Additional Information: Departmental Category: Art History

ARTH 4149 (3) Greek Cities and Sanctuaries

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4149 and CLAS 5149

Additional Information: Departmental Category: Art History

ARTH 4169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5169 and CLAS 4169 and CLAS 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4189 (3) Medieval Art

Focuses on one area of medieval art. Topics vary, but may include Carolingian, Ottonian, Romanesque, or Gothic art. Emphasizes critical thinking, methods of scholarly research, and development of writing skills.

Additional Information: Departmental Category: Art History

ARTH 4199 (3) Roman Architecture

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4199 and CLAS 5199

Additional Information: Departmental Category: Art History

ARTH 4209 (6) Classical Archaeological Field Methods

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4209 and CLAS 5209

Recommended: Prerequisites CLAS 1509 or ARTH 1509 or ARTH 2039 and ARTH 2049.

Additional Information: Departmental Category: Art History

ARTH 4229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5229 and CLAS 4229 and CLAS 5229

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Art History

ARTH 4269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5269 and CLAS 4269 and CLAS 5269

Recommended: Prerequisite CLAS 1509 or ARTH 1509.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Art History

Departmental Category: Asia Content

ARTH 4279 (3) Michelangelo (1475-1564)

Focuses on Michelangelo's long career, marked by outstanding achievements in sculpture, painting, architecture and poetry. Emphasizes his projects and achievements in light of 16th century artistic theory, including relationships to his contemporaries in the arts and literature.

Additional Information: Departmental Category: Art History

ARTH 4309 (3) Neoclassicism and Romanticism: 1760-1840

Surveys painting and sculpture in England and France from the last quarter of the 18th century through the first half of the 19th century.

Additional Information: Departmental Category: Art History

ARTH 4319 (3) European Art from 1830 to 1886

Surveys the major movements in painting in France and England from the Revolution of 1830 to the impressionist crisis of 1886. Emphasizes and discusses painting and major expressions in sculpture and architecture.

Additional Information: Departmental Category: Art History

ARTH 4329 (3) Modern Art 1

Provides an in-depth study of the fin de siècle, stressing postimpressionism, art nouveau and symbolism. Concludes with fauvism in France and the expressionist movement in Germany.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art History

ARTH 4339 (3) Modern Art 2

Begins with early Picasso and cubism, including analytic and synthetic cubism and emphasizing the various isms of the 20th century. Also studies Italian futurism, de Stijl and the Bauhaus, dada and surrealism.

Additional Information: Departmental Category: Art History

ARTH 4419 (3) The Arts of Colonial Mexico and Peru

Examines important works, artists, and themes that comprise the artistic production of colonial Latin America. Focuses on the intermingling, convergence, and at times the clash of European, Amerindian, and African cultures, which established the foundation of Latin America's pluralism.

Recommended: Prerequisite ARTH 3729.

Additional Information: Departmental Category: Art History

ARTH 4449 (3) Arts of India and Southeast Asia

Surveys Indian painting, sculpture and architecture from its earliest phases in the Indus Valley through the Mughal Empire. Encompasses Hindu, Buddhist and Islamic art of the subcontinent and Southeast Asia, as well as Himalayan cultures directly impacted by India's artistic legacies. Department enforced prerequisite: one 3000-level art history course (minimum grade D-).

Additional Information: Departmental Category: Art History

ARTH 4459 (3) Precolumbian Art of Mesoamerica

Introduces students to the art, architecture, and cultures of Mesoamerica, a region that encompasses modern-day Mexico, Guatemala, Belize, and parts of El Salvador, and Honduras. Focuses on major Pre-Columbian art objects and monuments to learn about the societies and cultures from which they came. Also considers the various roles that the visual arts and architecture played in these societies. Covers Olmec through Aztec civilizations.

Recommended: Prerequisite ARTH 3729.

Additional Information: Departmental Category: Art History

ARTH 4559 (3) Twentieth-Century Architecture

Examines the major movements and development in European and American architecture, 1900-1960's. Considers the major styles, as well as cultural interactions, race/ethnicity, gender and class concerns as they relate to both the practice and profession of architecture.

Additional Information: Departmental Category: Art History

ARTH 4569 (3) United States Architecture

Examines architecture as it developed in the area now defined as the continental United States from early cultures to the present. Considers the major styles and issues of cultural interaction, race/ethnicity, gender and class concerns as they relate to the practice, theory, and profession of architecture.

Additional Information: Departmental Category: Art History

ARTH 4599 (3) Contemporary Architecture

Examines the history and theory of contemporary architecture. In the field of architecture, theory and history differ in that the former describes and analyzes past work, while theory offers alternative solutions or new strategies for approaching the discipline. Both of these components are key to understanding contemporary architecture, and this course will work between the two modes of understanding.

Additional Information: Departmental Category: Art History

ARTH 4609 (3) Critical Issues in Photography

Examines the history and theory of photography and the relationship of photography to the other arts, as well as to literary, political, social and philosophical issues. Analyzes the critical issues that inform photography through the writings of critics, historians, and photographers using both thematic and chronological approaches.

Additional Information: Departmental Category: Art History

ARTH 4629 (3) Degas Seminar

Introduces current Degas studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles. Fulfills requirement for ARTH 4919, Capstone Seminar.

Additional Information: Departmental Category: Art History

ARTH 4639 (3) Manet Seminar

Introduces current Manet studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles. Fulfills requirement for ARTH 4919, Capstone Seminar.

Additional Information: Departmental Category: Art History

ARTH 4649 (3) Impressionism & Post-Impressionism

Fosters creative study of the background and foundation in modern art. Considers 19th-century European painting and, to a lesser degree, sculpture, in relation to social, cultural, and political history from 1863 to 1900. Focuses on France, but gives attention to other countries as well.

Additional Information: Departmental Category: Art History

ARTH 4669 (3) Romanticism & Realism

Fosters creative study of the background and foundation of modern art. Considers 19th-century European (and, to a lesser degree, American) painting and sculpture in relation to social, cultural, and political history from 1789 (the French Revolution) to 1863 (the Salon des refusés). Focuses on France, but gives attention to other countries as well.

Additional Information: Departmental Category: Art History

ARTH 4679 (3) Romanticism Seminar

Introduces current Romanticism studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles.

Additional Information: Departmental Category: Art History

ARTH 4689 (3) Post-Impressionism Seminar

Introduces current Post-Impressionism studies and research methods by drawing upon recent books, exhibition catalogues, and scholarly journal articles.

Additional Information: Departmental Category: Art History

ARTH 4699 (3) The Idea of Art

Studies contemporary critiques of historical ideas about the twin institutions of the university and the museum and the role of art history in the cultural mission of both. Explores fundamental questions about the role of art in society through weekly discussions of readings, a class presentation, and final research. Fulfills ARTH 4919 capstone seminar required for art history majors.

Additional Information: Departmental Category: Art History

ARTH 4739 (3) The Intellectual Roots of Italian Renaissance Art

Studies critical issues raised in the literature on art, focusing on Renaissance interpretations of key historical themes such as imitation and decorum. Carefully examines the language used in primary sources (available in English).

Additional Information: Departmental Category: Art History

ARTH 4749 (3) Italian Renaissance Art: Studies in the Exchange between Theory and Practice

Addresses how artists developed new compositional procedures, graphic techniques and audiences, and how these procedures were theorized in an age when artists' intellectual and social status rose dramatically. Explores reception of new graphic technology. Studies specific commissions and primary texts in depth.

Additional Information: Departmental Category: Art History

ARTH 4769 (3) Gender Studies in Early Modern Visual Culture

Examines 15th and 16th century European ideas about women from a variety of feminist perspectives. Focuses on recent contributions to history of women as they intersect with the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4769

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Art History

ARTH 4779 (3) Multicultural Perspectives on New Mexican Santos

Reflects upon the question: in what sense were the regional variants of European devotional images the effects of meaningful cultural interaction? Evidence considered includes oral traditions, pueblo pottery and painting, emphasizing interpretations that respect rights of communities to maintain privacy.

Additional Information: Departmental Category: Art History

ARTH 4909 (1-3) Independent Study---Art History

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Art History

ARTH 4919 (3) Capstone Seminar: Topics in Art History

Seminar course dealing with selected areas or problems within the history of art. Consult current online Schedule Planner for seminar topic.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Art History (AAAH) majors only.

Additional Information: Departmental Category: Art History

ARTH 4929 (1-3) Special Topics in Art History

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5929

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4939 (3-6) Art Museum Internship

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5939

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 4959 (3) Art History Honors Thesis

May be elected during the final semester. Consists of a substantial, original written thesis. Requires faculty sponsorship. Does not guarantee a student will receive honors.

Additional Information: Arts Sciences Honors Course
Departmental Category: Art History

ARTH 5029 (1) Art History Research Methods

Learn to expertly navigate art scholarship and be prepared to do thesis-level research. An introduction to the vast array of art historical resources and their uses. Explore advanced techniques for searching both online and offline sources of art information. Master the various modes of art historical research, including finding iconographic, historical, or technical information.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4029 and LIBR 4029

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5109 and ARTH 4109 and ARTH 5109

Additional Information: Departmental Category: Art History

ARTH 5119 (3) Roman Sculpture

Examines ancient Roman sculpture with emphasis on the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4119 and CLAS 4119 and CLAS 5119

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4139 and CLAS 4139 and CLAS 5139

Additional Information: Departmental Category: Art History

ARTH 5159 (3) Hellenistic Art and Archaeology

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5159

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture. Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4169 and CLAS 4169 and CLAS 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art History

ARTH 5179 (3) City of Athens

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periclean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5179

Additional Information: Departmental Category: Art History

ARTH 5189 (3) City of Rome

Explores in detail the architecture, sculptures, coins, frescos and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5189

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4229 and CLAS 4229 and CLAS 5229

Additional Information: Departmental Category: Art History

ARTH 5269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4269 CLAS 4269 and CLAS 5269

Additional Information: Departmental Category: Art History
Departmental Category: Asia Content

ARTH 5909 (1-3) Graduate Independent Study---Art History

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art History

ARTH 5929 (1-3) Special Topics in Art History**Equivalent - Duplicate Degree Credit Not Granted:** ARTH 4929**Repeatable:** Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.**Additional Information:** Departmental Category: Art History**ARTH 5939 (3-6) Art Museum Internship**

Focuses on opportunities at the Denver Art Museum, working with individual curators and master teachers in selected areas, such as audience interpretation, interpretive research files, and public school curriculums. Introduces students to the professional culture and activities of art museums.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4939**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Additional Information:** Departmental Category: Art History**ARTH 5949 (3) Visiting Scholars Seminar**

Brings speakers to campus to work with seminar students, usually four guest scholars per semester, subjects vary. Students read scholar's work and discuss methodological issues. Focuses on the research and insight of scholars who are currently shaping the field and defining research agendas. Required for all MA art history students, open to others.

Repeatable: Repeatable for up to 6.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Art History**ARTH 5959 (3) Introduction to Critical Theory for Visual Studies**

Provides overview for critical theory from Marx to contemporary writers with emphasis on their relevance to visual studies. Addresses issues that underlie a wide range of academic discussion in arts and sciences. Foucault, Derrida, Said, Lacan and other authors will be subject to weekly discussions leading to research papers, presentations, and projects. Class fulfills critical theory requirement for MFA and MA students.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Art History**ARTH 6150 (3) Critical and Theoretical Issues in Museums**

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 6150 and HIST 6150 and ANTH 6150**Requisites:** Requires prerequisite course of MUSM 5011 (minimum grade D-). Restricted to graduate students only.**Additional Information:** Departmental Category: Art History**ARTH 6929 (3) Seminar: Theories of Art History**

Provides a systematic critical overview of the development of art history as a discipline beginning with 18th century theories of aesthetics and ending with current interdisciplinary models of critical interpretation. Weekly readings, discussions, reports, and written papers constitute the format of this seminar in methodology. Topics vary from semester to semester. Required for MA (art history) students.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.**Additional Information:** Departmental Category: Art History**ARTH 6939 (3) Graduate Seminar: Open Topics in Art History**

Subjects and topics vary.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students or Art History Concurrent Degree (C-AAAH) or Film Art History Concurrent Degree (C-FILMAAAH) students only.**Additional Information:** Departmental Category: Art History**ARTH 6949 (1) Master's Candidate for Degree****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**Additional Information:** Departmental Category: Art History**ARTH 6959 (1-6) Master's Thesis (Art History)****Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Art History**ARTH 6969 (1-6) Master's Project (Art History)****Repeatable:** Repeatable for up to 6.00 total credit hours.**Additional Information:** Departmental Category: Art History

Art Studio and Non-Studio (ARTS)

Courses

ARTS 1002 (3) Beginning Drawing 1

Formal visual elements are presented through a study of spatial relationship. Built around a series of related problems, each of which is designed to develop fluency in drawing, offer experience in handling media, foster self-confidence and promote an understanding of the visual elements and their role in the development of pictorial space.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.**Additional Information:** Departmental Category: Painting/Drawing**ARTS 1003 (3) Printmaking for Non-Majors**

Emphasizes processes involved with both nonmultiple and multiple methods, including but not limited to metal plate etching (intaglio), lithography, collagraph, woodcut, linoleum cut, Xerox transfer, and monotype. Places equal emphases on developing drawing skills and understanding design principles.

Additional Information: Departmental Category: Printmaking

ARTS 1010 (3) Introduction to Studio Art

Presents creative activity conceptually, and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Fine arts majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

Requisites: Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Foundations

ARTS 1012 (3) Drawing for Non-Majors

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1020 (3) Introduction to Studio Art 2

Presents creative activity conceptually and art history thematically, with an interdisciplinary, experimental, and multicultural focus. Art and art history majors explore visual literacy and culture through presentations and student-centered projects that emphasize individual development.

Requisites: Requires prerequisite course of ARTS 1010 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Foundations

ARTS 1030 (3) Principles of Color

Introduces the relative effects of color as used by the artist. Emphasizes the practice of color relations including basic characteristics, mixtures, illusions, optical mixture, color intervals, and color quantity. May not be repeated.

Additional Information: Departmental Category: Foundations

ARTS 1171 (3) Photography for Non-Majors

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable film camera.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 2171

Additional Information: Departmental Category: Photography

ARTS 1202 (3) Basic Painting

The aim of this course is to develop the basic skills, techniques and processes of painting with an understanding of basic colour principles. This integration of paint application and colour principle will develop awareness that painting and colour are used, not only as mediums for representation, but also as mediums for expressive purposes. Demonstrations, lectures, group and individual critiques will be given throughout the course.

Requisites: Requires prerequisite course of ARTS 1010 (minimum grade D-). Requires a corequisite course of ARTS 1020. Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1212 (3) Painting for Non-Majors

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated.

Additional Information: Departmental Category: Painting/Drawing

ARTS 1514 (3) Sculpture for Non-Majors

Offers an orientation involving three-dimensional form and application. Studies expressive and conceptual problems based on non-objective form relationships in various sculptural materials. May not be repeated.

Additional Information: Departmental Category: Sculpture

ARTS 1875 (3) Ceramics for Non-Majors

Encompasses broad and fundamental uses of clay. Basic instruction and demonstration of throwing, hand building, and primitive clay forming methods. Investigates utility, function, and ceramics in the broader context of contemporary art. Slide presentations explore historical and contemporary attitudes involving ceramics.

Additional Information: Departmental Category: Ceramics

ARTS 2004 (3) Participatory Objects (Sculpture and Post-Studio Practice)

Looks at the tendency in contemporary sculpture to create interactive objects and experiences for the viewer. Students in this course are required to create hands-on projects, participate in group critiques and develop presentations and research projects.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 2022 (3) Beginning Drawing

Emphasizes proportion and perspective through observation based drawing. Students are introduced to various drawing materials and learn to translate what they see into drawing media using two basic subjects: still-life and the figure.

Requisites: Requires prerequisite course of ARTS 1010 and prerequisite or corequisite course of ARTS 1020 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 2085 (3) Ceramics 2: Handbuilding

Introduces techniques of hand-built clay forms as they relate to function and nonfunction. Various clay techniques, glazing and firing procedures are explored. Emphasizes ceramics in the broader context of contemporary art. May not be repeated.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 2095 (3) Ceramics 2: Wheelthrowing

Introduces techniques of wheel-thrown forms as they relate to function and nonfunction. Explores various glazing and firing methods. May not be repeated.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 2104 (3) Colossal Objects (Sculpture and Post-Studio Practice)

Focuses on the conception, design and production of art works that are larger than human scale. Each object will be the result of individual and team design collaboration. Primarily focuses on sculpture constructed and engineered from metal although other materials are welcome.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 2126 (3) Digital Art 1

An introductory course in the use of the personal computer to create and process images in the visual arts.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 2171 (3) Photography 1

Introduces techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends. Students must have an adjustable camera.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 1171

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 2191 (3) Photography 2

Explores more sophisticated technical and conceptual skills to the creative process.

Requisites: Requires prerequisite course of ARTS 2171 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 2222 (3) Beginning Painting

Emphasizes color and descriptive mark making through observation based painting. Students are introduced to various painting materials and learn to translate what they see into painting media using two basic subjects: still-life and the figure.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 2244 (3) Drawing for Sculpture (Sculpture and Post-Studio Practice)

Explores and examines many relationships between sculpture and drawing. Projects will explore 2-D drawing and mixed media projects through the lens of sculptural practice. Scale, materials and styles will be researched along with topics such as the artists proposal, investigative processes, drawing and sculptural installations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 2303 (3) Beginning Relief

Emphasis on introductions to the concepts and techniques of relief processes, including white line, black line and four color reductive processes. Students will gain a working knowledge of fundamental relief processes, plus safe and appropriate use of all materials and equipment in the studio.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2403 (3) Beginning Intaglio

Emphasizes an introduction to techniques of intaglio and a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials/concepts. Emphasizes interrelationship of process, materials and ideas/aesthetics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2413 (3) Beginning Lithography

Exploration into stone lithography and aluminum plate is presented in this class. Individual direction and development of conceptual focus and studio techniques are important objectives in this class. Safer ways to make lithographs is highlighted and the toxic traditional methods are left behind.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2423 (3) Beginning Screenprinting

Exploration into screenprinting at the basic level, using stencil-making processes for screenprinting with acrylic-based screenprinting inks. Emphasis is placed on exploring and developing challenging concepts, mastering basic techniques and creating compositions and visual images that successfully convey your concept and challenge the viewer. Course is focused on the art of fine art printing on paper.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2433 (3) Beginning Alternative Printmaking

Presents creative development of concepts in printmaking beyond the traditional two-dimensional image on paper that is contained in a portfolio or frame. Focus will be made on expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 2453 (3) Beginning Monotype

Introduces the monoprint and monotype methods. Students will learn the about making non-editioned prints using a variety of four or more technical approaches. These processes will be discussed and demonstrated in depth. Students will develop a portfolio of finished prints during the semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 2504 (3) Basic Sculpture: Materials and Techniques

Introduces the basic properties of metal, wood and mold making. Students will explore and demonstrate an understanding of basic fabrication methods involved in each element. Students will investigate both traditional and non-traditional working methods and will consider how materials and techniques inform sculptural concepts.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 2524 (3) Visual Thinking (Sculpture and Post-Studio Practice)

Explores ideas concerning the structure and nature of visual thinking and their relationship to the creative thought process. Investigates form in terms of the organizing principles of three-dimensional design and its application to contemporary sculpture. Includes lecture and studio projects.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 3002 (3) Drawing Alternative Process/Materials

Continuation of Drawing 2. Offers creative possibilities in drawing and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information. May be repeated once.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2002 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3012 (3) Figure Drawing

Explores varied drawing techniques and media. Introduces concepts relevant to the understanding of drawing and the creative process. May not be repeated. Formerly ARTS 2002.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, this course provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3017 (1-3) Special Topics in Studio Arts

Introduces timely subjects in studio arts courses that cannot be offered on a regular basis. Information concerning the topics in any given semester is available prior to pre-registration from the department of Art and Art History.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 3022 (3) Intermediate Drawing

In addition to being a continuation of Beginning Drawing, Intermediate Drawing will focus on a non-traditional approach to making images encouraging conceptual development, experimentation and research. Moving beyond observation based drawings multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

Requisites: Requires prerequisite courses of ARTS 1010, 1020 and 2022 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 3054 (3) Modules and Multiples (Sculpture and Post-Studio Practices)

Exposes students to the practice of creating large works through smaller multiples and modules. By learning about the practices of artists such as Andy Warhol, Joseph Beuys, Rachel Whiteread and Robert Gober, along with many others, students will generate an understanding and appreciation for the module and multiple in contemporary art practice. Students will learn to cast using plaster and other type of molds, will be introduced to jigs as a way to streamline production of multiple objects and will work with found objects. Students will be required to complete 3 projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 3085 (3) Ceramics 3

Deals with further exploration of techniques approached in ARTH 2085 and ARTH 2095. Students are encouraged to develop personal concentration in relation to medium.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 2085 and ARTH 2095 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 3097 (1-3) Special Topics - Non-Studio

Introduces timely subjects in fine arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the Department of Art and Art History.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA) or Fine Arts-Studio (BASA and BFAS) or Fine Arts-Art History (BAAH) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 3124 (3) Intervention, Exchange, and Duration (Sculpture & Post-Studio Practice)

Focuses on the production of works of art outside of the traditional studio, museum and gallery. Projects will be designed to interrupt, intervene, co-opt, provide a service, exist for a defined amount of time, or engage a site, community or situation. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 3184 (3) Nothing Flat: Project a Week (Sculpture & Post-Studio Practice)

Provides students the opportunity to work with a range of sculptural materials through a series of quick projects (e.g. installation, objects, writing). Students will learn to generate ideas quickly, engage issues and formats particular to sculpture, and produce a wide range of work over 15 weeks. Formerly ARTS 2184.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 3191 (3) Photography 3

Continues the exploration of the possibility of individual photographic expression. Students are encouraged to discover and develop a personal position in relation to the medium.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 3196 (3) Photo-Imaging

Introduces techniques, software, and related concepts of digital photography as art. Emphasizes digital photography as a means to formal and expressive ends.

Requisites: Requires prerequisite course of ARTS 1171 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 3202 (3) Painting Alternative Process/Materials

Continuation of Painting 2. Offers creative possibilities in painting and related media. Emphasizes experimentation and individual expression. Content varies by semester according to instructor; contact individual instructor for more information.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3212 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3212 (3) Figure Painting

Explores varied painting techniques. Introduces concepts relevant to the understanding of painting and the creative process. May not be repeated. Formerly ARTS 2202.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3222 (3) Intermediate Painting

In addition to being a continuation of Beginning Painting, this course focuses on a non-traditional approach to making paintings encouraging conceptual development, experimentation and research. Moving beyond observation based painting multiple thematic possibilities will be explored. Emphasis will be placed equally on ideas and technical execution.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2222 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Painting/Drawing

ARTS 3224 (3) Picturing Sculpture

Explores the many ways photography and other forms of imagery have been utilized in the field of sculpture. Students will start from the sculptural, but those objects and installations will function as an intermediary to creating final work that will rest in the image. Include lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3236 (3) Electronic Arts Survey

Explores the development of video as an art form through tape screenings, readings, lectures, and discussions. Prerequisite for further studies in video production.

Additional Information: Departmental Category: Media Arts

ARTS 3303 (3) Relief 1

Continued exploration of relief processes: various techniques of the collage process in combination with the art and process of the collograph. Examining the collage aesthetic, creating collages and collograph prints from found materials and objects. Other skills to be focused on include registration methods, blend rolls and the experimentation with rubbings.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2303 (all minimum grade D-).

Additional Information: Departmental Category: Printmaking

ARTS 3354 (3) Bend, Build, Burn: Sculpture in Wood

Focuses on the production of works of art in wood. Class projects explore building, bending, and burning with wood. Focuses on sculptural constructed objects although possibilities of installation, site-specific and public art will also be explored.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3384 (3) Fleeting and Found: Ephemeral Sculpture

Focuses on creating sculpture projects which are ephemeral and temporary. Themes of process, lifespan, migration, tension, entropy and degradation will be explored. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3403 (3) Intaglio 1

Exploration into techniques of Intaglio with a focus on working with copper and ferric chloride. Historical approaches and use through contemporary materials and concepts. Emphasis is placed on mastering basic techniques, creating compositions and visual images, and exploring and developing concepts that challenge the viewer.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 3413 (3) Lithography 1

Introduces the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Not available to freshmen. Taught with ARTS 4413 and ARTS 5413.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 3423 (3) Screen Printing 1

Introduces the study of silkscreen techniques, emphasizing creativity, individual development, and experimentation in contemporary silkscreen processes.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 3433 (3) Alternative Printmaking 1

Continued exploration into the development of alternative techniques and materials, methods of extending the print beyond 2-dimensions and expanding the concept of what is a print will be explored in relation to each student's studio practice and interests.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2433 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 3434 (3) Collaboration: Art and Collective Action

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3453 (3) Monotype 1

A continued exploration in the monoprint and monotype methods. Use of a varied grouping of matrixes will be the focus of this class. Students will develop a portfolio of finished prints during the semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 2453 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 3504 (3) Sculpture 3: Experiments 1

Explores materials, methods, and techniques through a series of assignments emphasizing individual ideas and their relationship to contemporary aesthetics.

Requisites: Requires prerequisite courses of ARTS 2504 and ARTS 2524 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 3514 (3) Sculpture 3: Experiments 2

Explores individual concepts and ideas and their relationship to contemporary issues and aesthetics. a series of assignments are worked out with the instructor based on individual interest.

Requisites: Requires prerequisite course of ARTS 3504 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 3604 (3) Beyond the Studio: Post-Studio Art Practice

Overview of post-studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3614 (3) Lost in Space: Installation Art

Students learn how to develop ideas in relation to installation art, exhibition spaces, and explore practical skills to help carry out their ideas. Includes lectures, readings and discussion, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3702 (3) Special Focus in Painting and Drawing

Offers varied focus and special topics in painting, drawing, and related media to explore specialized directions and creative possibilities.

Emphasizes experimentation. Content varies by semester; contact individual instructor for more information.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ARTS 2002 or ARTS 2202 (minimum grade D-).

Recommended: Prerequisite ARTS 3002 or ARTS 3202.

Additional Information: Departmental Category: Painting/Drawing

ARTS 3714 (3) Experimental Structures (Sculpture and Post-Studio Practice)

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 3841 (1-3) Undergraduate Independent Study---Photography

Reserved only for special projects in photography, not offered in the curriculum. Requires a detailed proposal, instructor's signature and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3191 or ARTS 4161 (minimum grade D-).

Additional Information: Departmental Category: Photography

ARTS 3842 (1-3) Undergraduate Independent Study---Painting

Reserved for special projects in painting not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3202 (minimum grade D-).

Additional Information: Departmental Category: Painting/Drawing

ARTS 3845 (1-3) Undergraduate Independent Study---Ceramics

Reserved for special projects in ceramics not offered in the curriculum. Requires a detailed proposal, instructor's sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ARTS 3085 (minimum grade D-).

Additional Information: Departmental Category: Ceramics

ARTS 3847 (1-3) Independent Study

Reserved for special projects not offered in the curriculum. Department enforced prerequisite: detailed proposal, instructor sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 3906 (1-3) Undergraduate Independent Study---Video

Reserved for special projects in video not offered in the curriculum.

Requires a detailed proposal, instructor's sponsorship, and departmental approval.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 4246 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 3937 (1-6) Internship

Gives upper-division students the opportunity to work in public or private organizations on assignments relating to their career goals, and allows them to explore the relationship between theory and practice in their major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4002 (3) Advanced Drawing/Portfolio

Continuation of Drawing 3. Advanced studio class in drawing for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3002 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 4004 (3) Land and Environmental Art (Sculpture and Post-Studio Practice)

Covers land and environmental art, providing an historical survey along with hands on projects in the landscape. Focusing on themes of site, environment, landforms, weather, and earth materials, students will design and realize art projects on the land. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4014 (3) Art and Social Practice (Sculpture and Post-Studio Practice)

Covers social art practice, providing an historical survey along with hands on projects in social environments. Focusing on issues of public space, economic and cultural marginalization and political causes, provides students a forum for expressions of social reality. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4017 (1-3) Special Topics in Studio Arts

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5017

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4024 (3) Public Art

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5024

Requisites: Requires a prerequisite or corequisite course of ARTS 1020 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Recommended: Prerequisites ARTS 2504 and ARTS 2524 and ARTS 3504.

Additional Information: Departmental Category: Sculpture

ARTS 4085 (3) Ceramics 4

Develop a personal creative practice through self-generated, independent projects. The focus is on developing an individual studio discipline through experimentation, research, reading and writing and examining the work in individual critiques.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 4087 (3) Selected Topics in Contemporary Art

Selectively studies significant areas of visual art of the last decade including major critical opinions.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5087

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite of 20 units of ARTS or ARTH coursework completed (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4095 (3) Special Topics in Ceramics

Designed for students majoring in ceramics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5095

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3085 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Ceramics

ARTS 4097 (1-3) Special Topics-Non-Studio

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5097

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4104 (3) Performance/Installation

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5104

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sculpture

ARTS 4107 (1-3) Special Topics

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4117 (3) BFA Seminar

For students intending to pursue graduate work and/or a professional career in art. Emphasizes the development of a critical overview of their work and interests and how they relate to the problems of professional activity.

Requisites: Restricted to Studio Arts (AASF) majors only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4118 (3) Visiting Artist Program

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts. Department enforced prerequisite: portfolio review.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5118

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Visiting Artist Program

ARTS 4126 (3) Digital Art 2

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5126

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4127 (3) Art from Nature

Provides an opportunity for advanced students to create nature based art. Studio work and/or appropriate on-site works will be generated through readings and individual and group experiences of nature.

Requisites: Requires prerequisite of one 4000-level ARTS course (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4130 (3) Integrated Media

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/semblage, correspondence art, artist's books, site-specific, performance, audio and video art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5130

Additional Information: Departmental Category: Integrated Arts

ARTS 4154 (3) Metalsmithing 1

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5154

Requisites: Requires prerequisite courses of ARTS 1010, 1020, at least one 2000-level ARTS course, and at least one 3000-level ARTS course (all minimum grade D-).

Additional Information: Departmental Category: Sculpture

ARTS 4161 (3) Photography 4

Explores advanced techniques and concepts of photography as art. Emphasizes photography as a means to formal and expressive ends.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 4171 (3) New Directions in Photography

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5171

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ARTS 3191 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Photography

ARTS 4176 (3) New Directions in Digital Art

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5176

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 2126 and ARTS 4316 or ARTS 5316 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4196 (3) Advanced Photo-Imaging

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5196

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 2191 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 4202 (3) Advanced Painting/Portfolio

Continuation of Painting 3. Advanced studio class in painting for creative expression and individual portfolio development. Emphasis varies by semester; contact individual instructor for more information.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3202 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 4217 (3) Art and Race/Ethnicity

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5217

Recommended: Prerequisites ARTS 1300 and ARTS 1400 or instructor consent required.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4226 (3) Advanced Computer Imaging

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5226

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 4126 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4236 (3) Electronic Arts Survey 2

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5236

Additional Information: Departmental Category: Media Arts

ARTS 4246 (3) Beginning Video Production

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5246 and FILM 4240

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTH 1300 or ARTH 1400 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4303 (3) Relief 2

Continued exploration into the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3303 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 4316 (3) History and Theory of Digital Art

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5316

Requisites: Requires prerequisite course of ARTS 2126 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Media Arts

ARTS 4327 (3) Biennial Art

Covers art represented in the most current international biennials (Documenta, Venice Biennale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5327

Requisites: Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4346 (3) Intermediate Video Production

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5346 and FILM 4340

Requisites: Requires prerequisite course of ARTS 4246 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 4403 (3) Intaglio 2

Continued exploration of techniques of intaglio process, including non-acid and ferric chloride techniques with copper as the main matrix being used. Possible processes focused on include: photo etching using solar plates and introduction to printing ala poupee wiping, chine colle and basic color. Building a unified body of work is the main focus. .

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3403 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4413 (3) Lithography 2

Continues the study of stone and metal plate lithography, emphasizing individual creative development in black and white and further development in color printing processes. Digital imaging and nontoxic processes are emphasized as much as possible. Taught with ARTS 3413 and ARTS 5413.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3413 (minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4423 (3) Screen Printing 2

Introduces advanced screen printing technology, emphasizing individual creativity and the ability to resolve problems of two-dimensional form.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 3423 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4433 (3) Alternative Printmaking 2

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5433

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3433 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4434 (3) Collaboration: Art & Collective Action

Covers both historical background and hands on projects that are collaborative in nature. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4444 (6) Art and Rural Environments Field School

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5444

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisite ARTS 2504.

Additional Information: Departmental Category: Sculpture

ARTS 4446 (3) Advanced Video Production

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5446 and FILM 4440

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 4346 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 4453 (3) Monotype 2

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5453

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 and ARTS 3453 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Printmaking

ARTS 4457 (3) Sound Art Seminar

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5457

Requisites: Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4504 (3) Advanced Sculpture Studio

Students in this course will be required to complete projects, participate in group critiques of projects, produce a slide presentation on a contemporary artist whose work/practice fits within the theme of the course and prepare a final portfolio. Studio work and demonstrations will be augmented by readings and discussions on contemporary art.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ARTS 3504 and ARTS 3514 (all minimum grade D-). Restricted to Studio Arts (AASA or AASF) or Art History (AAAH) majors only.

Additional Information: Departmental Category: Sculpture

ARTS 4604 (3) Beyond the Studio: Post-Studio Art Practice

Overview of Post-Studio art practice and covers the historical landscape of artists and projects that have pushed "beyond the studio" since 1970. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4607 (3) Art and Social Change

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 5607

Requisites: Requires prerequisite courses of ARTH 1300 and ARTH 1400 (minimum grade D-).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 4714 (3) Experimental Structures (Sculpture and Post Studio Practice)

Explores the interface of sculpture and architecture. Looks at individuals and collectives that have become renowned for their work with experimental structures and students will have the opportunity to build hands-on experiments. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Requisites: Requires prerequisite courses of ARTS 1010 and ARTS 1020 (all minimum grade D-).

Recommended: Prerequisites ARTS 2504 and ARTS 2524.

Additional Information: Departmental Category: Sculpture

ARTS 4717 (1-3) Studio Critique

Consists of consultations with faculty on individual studio problems and projects. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5017 (1-3) Special Topics in Studio Arts

Introduces timely subjects in studio art courses that cannot be offered on a regular basis. Information on topics in any given semester is available prior to pre-registration in departmental office.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4017

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5024 (3) Public Art

Focuses on the two areas 1) lecture/discussion, both based on political, historical and the aesthetic evolution regarding examples of public art and 2) current practice, in reference to how to use such information to generate new more innovative and original ideas regarding public art and its application. Includes lectures, readings and discussions, writing assignments, studio projects and visual presentations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4024

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5075 (3) Graduate Ceramics

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ceramics

ARTS 5087 (3) Selected Topics in Contemporary Art

Selectively studies significant areas of visual art of the last decade including major critical opinions.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4087

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5095 (3) Graduate Special Topics in Ceramics

Designed for students majoring in ceramics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4095

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ceramics

ARTS 5097 (1-3) Special Topics-Non-Studio

Introduces timely subjects in the visual arts that cannot be offered on a regular basis. Information concerning the topics offered in any given semester is available prior to preregistration from the fine arts department.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4097

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5104 (3) Graduate Performance/Installation

Primarily focuses upon personal imagery as a live situation occurring in either an invented constructed reality or real environment. Work may be individual or group configuration and may also take on the visual linguistic form of a solo performance or of a multimedia presentation.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4104

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5107 (1-3) Special Topics

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5117 (3) Graduate Art Seminar

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5118 (3) Graduate Visiting Artist Program

Artists of national and international reputation, interacting with graduate and advanced undergraduate students, discuss their studio work at seminar meetings and at public lectures or events. Provides continuous input of significant developments and a comprehensive view of contemporary issues in the arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4118

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Visiting Artist Program

ARTS 5126 (3) Graduate Digital Art 2

Offers studio experience using personal computer in the generation and processing of imagery in the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4126

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5130 (3) Integrated Media

Encourages experimentation with media and integration of traditional areas of drawing, painting, sculpture and photography. Covers two- and three-dimensional collage/assemblage, correspondence art, artist's books, site-specific, performance, audio and video art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4130

Additional Information: Departmental Category: Integrated Arts

ARTS 5140 (3) Integrated Arts Studio

Explores the creative process through a series of conceptually-based studio exercises. Students are encouraged to work across traditional media boundaries as they address themes such as identity, place, spirituality, politics, and consumerism. Includes individual and collaborative studio projects, as well as reading and writing about the course themes.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Integrated Arts

ARTS 5150 (3) Graduate Integrated Arts

Investigates the conjunction of interdisciplinary concepts in the creation of art. Looks beyond traditional media to new sources for art-making. A curious intellect, combined with exceptional research skills, will be the basis for original writing and rigorous discussion.

Repeatable: Repeatable for up to 18.00 total credit hours.

Additional Information: Departmental Category: Integrated Arts

ARTS 5154 (3) Metalsmithing 1

Introduces students to the fundamental techniques used in metalsmithing, including cold and hot fabrication techniques, forming and coloring. Through projects, discussions, readings and demonstrations, students will learn how to create, analyze, understand and critique contemporary metalwork. Projects will focus on design and concept development, while enhancing students' technical and problem-solving skills.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4154

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5161 (3) Graduate Photography

Repeatable: Repeatable for up to 18.00 total credit hours.

Additional Information: Departmental Category: Photography

ARTS 5171 (3) New Directions in Photography

Investigates the use of the photographic image in new, antique, or nonstandard ways including nonsilver, photosculture, various color processes, photolanguage, photoinstallations, electronic media, performance, filmmaking, electrostatic art (copy machine), photobooks, photocollage, and audio/visual art. Course content changes each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4171

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Photography

ARTS 5176 (3) Graduate New Directions in Digital Art

Investigates the use of digital art in various contexts including digital narrative, web publishing, Internet art, multimedia performance, animation, conceptual art, information art, sound art, language art and network installations.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4176

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5196 (3) Graduate Advanced Photo-Imaging

Offers an in-depth exploration of digital imaging in the context of the history, aesthetics, and tradition of photography as contemporary art. Emphasis is on digital manipulation, output and individual growth and development.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4196

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Media Arts

ARTS 5202 (3) Graduate Painting

Repeatable: Repeatable for up to 18.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Painting/Drawing

ARTS 5217 (3) Art and Race/Ethnicity

Examines the impact of race and ethnicity on the art world. Examines the art of Native Americans, Chicanos, Puerto Ricans, Cuban Americans, Latin Americans, African Americans, Asian Americans and ethnic and cultural mixing. Grounded in Critical Multicultural Theory and Postcolonial Theory.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4217

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5226 (3) Graduate Advanced Computer Imaging

Explores advanced techniques and concepts of digital image-making. Emphasizes the creative application of computer imaging in the production of visual art through individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4226

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ARTS 5126 (minimum grade D-).

Additional Information: Departmental Category: Media Arts

ARTS 5236 (3) Graduate Electronic Arts Survey 2

Continuation of electronic arts survey. Explores the development of video as an art form. Prerequisite for further studies in video production.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4236

Additional Information: Departmental Category: Media Arts

ARTS 5246 (3) Graduate Beginning Video Production

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4246 and FILM 4240

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5303 (3-18) Graduate Relief

Continues the study of the expressive/formal aesthetics of relief processes. Studio practice/investigation of artistic attitudes as exemplified through historical perspectives, traditional/contemporary usages. Students with limited experience in relief processes will be given an overview in those practices.

Repeatable: Repeatable for up to 18.00 total credit hours.

Requisites: Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Printmaking

ARTS 5316 (3) Graduate History and Theory of Digital Arts

Explores the history and theory of digital art. Discussion topics include the emergence of Internet art, hypertext, new media theory, online exhibitions, web publishing, virtual reality and the networked interface. Includes collaborative and individual projects.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4316

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5327 (3) Biennial Art

Covers art represented in the most current international biennials (Documenta, Venice Bienale, Sao Paulo Biennial, Havana Biennial, Gwanju Biennial and the Istanbul Biennial). Art will be analyzed by applying postmodern theory, postcolonial theory and international theoretical perspectives that have not yet been integrated into Western thought.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4327

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5346 (3) Graduate Intermediate Video Production

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4346 and FILM 4340

Requisites: Requires prerequisite course of ARTS 4246 or ARTS 5246 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5403 (3) Graduate Intaglio

Continuation of the study of expressive and formal aesthetics of Intaglio processes. Studio practice and investigation of artistic attitudes as exemplified through historical perspectives, traditional, and contemporary usages. Building a body of work in this course is the goal. Taught with ARTS 3403 and ARTS 4403.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to Studio Arts or Art History (AASA or AAAH) graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5413 (3) Graduate Lithography

Taught with ARTS 3413 and ARTS 4413.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5423 (3) Graduate Screen Printing

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5433 (3) Graduate Alternative Printmaking (Non-Toxic)

Continued research into developing a sharper critical response, both aesthetically and conceptually, to their own work, as well as the work of other artists. Various alternative printmaking methods will be introduced and each student is expected to explore and examine these processes through a body of work. Emphasis is put on the interrelationship of processes, materials and ideas/aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4433

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5444 (6) Art and Rural Environments Field School

Puts students in touch with various rural landscapes in Colorado. Takes place off campus each summer during Maymester. Focuses on site-based approaches to art creation and is designed as an experiential course, meaning that students learn through the experience of place, and then by the process of making. After introductions to each site, students will be responsible for a site interpretation piece utilizing various mediums including photography, drawing, land art and collaboration.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4444

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5446 (3) Graduate Advanced Video Production

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4446 and FILM 4440

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Media Arts

ARTS 5453 (3) Graduate Monotype Printing

Continued research into developing techniques of using a varied grouping of matrixes will be the focus of this class. Students will be expected to develop sharper critical responses both aesthetically and conceptually, to their own work, as well as the work of other artists.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4453

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Printmaking

ARTS 5457 (3) Sound Art Seminar

Covers the history of sound art from Luigi Russolo and his noise machine during the Futurist Movement to today's experimental music/sound art contributions. Students will listen to sound art works by artists in all areas of sound art, as well as read about theoretical views on sound art.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4457

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5504 (3) Graduate Sculpture

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sculpture

ARTS 5540 (3) Generative Art

Attends to the interdisciplinary pursuits of scientists, humanists and anyone interested in creating works of visual art according to step by step procedures as in musical compositions, mathematical formulae, linguistic rules, computer programs, etc. Includes collaborative and individual projects.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Integrated Arts

ARTS 5607 (3) Art and Social Change

Examines how art is used as an agent for social change. Among topics addressed by artists interested in social change are: immigration, HIV/AIDS, illness/disease, ecology/the environment, feminism, gay and lesbian issues, war, violence, racial and ethnic minorities, etc.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4607

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5717 (1-3) Graduate Studio Critique

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5857 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Seminars/Special Topics

ARTS 5901 (1-3) Graduate Independent Study---Photography

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Photography

ARTS 6957 (1-6) Master of Fine Arts Creative Thesis

Additional Information: Departmental Category: Seminars/Special Topics

Arts & Sciences Courses (ARSC) Courses

ARSC 1000 (3-4) Expository Writing

Develops college-level reading, writing, and thinking. Students are asked to read critically, then construct written responses that are revised and crafted into more formal essays and position papers. Offered through the Student Academic Services Center. Department enforced prerequisite: program coordinator consent required.

Additional Information: Departmental Category: Writing

ARSC 1080 (4) College Writing and Research

Introduces academic and professional genres through the research and inquiry process. Students practice close reading, oral presentation, drafting, synthesis, analysis and research skills in discussion, writing workshops, and one-on-one conferences.

Additional Information: Arts Sci Core Curr: Written Communication

Departmental Category: Writing

MAPS Course: English

ARSC 1081 (1) SASC Coseminar: College Writing and Research

One-credit seminar provides extended instruction in written composition for students enrolled in ARSC 1080. Graded assignments enrich students' understanding of genre, organization, research skills, and grammar.

Department enforced corequisite: ARSC 1080.

Additional Information: Departmental Category: Writing

ARSC 1150 (3) Writing in Arts and Sciences

Emphasizes the development of effective writing skills with instruction provided in expository and analytical writing. Reviews basic elements of grammar, syntax, and composition as needed.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication

Departmental Category: Writing

MAPS Course: English

ARSC 1200 (1-3) Topics in Arts and Sciences

Additional Information: Departmental Category: Special Curricula

ARSC 1400 (1) MASP Coseminar: Chemistry 1 & 2

Supplements and strengthens student experiences in chemistry. Allows particularly gifted students an opportunity to extend their understanding of the subject and to explore possible careers in science.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1420 (1) MASP Coseminar: Introduction to EEB

Designed to supplement and strengthen student experiences in EBIO 1210 and EBIO 1220. Allows particularly gifted students an opportunity to extend their understanding of the subject and possible careers in science.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1432 (1) MASP Coseminar: Economics

Designed to supplement and strengthen student experiences in microeconomics. Allows particularly gifted students an opportunity to extend their understanding of the subject and to explore possible careers in social science.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1440 (1) MASP Coseminar: Mathematics

Offers an unusual and essential opportunity for students to receive small-group enrichment and reinforcement. Supplements and strengthens student experiences in mathematics, allowing particularly gifted students an opportunity to extend their understanding of the subject in a supportive environment, and to explore possible careers in science.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1450 (3) Intro to STEM Research Method: In the Field and at the Bench

Uses experiential learning as a strategy to teach STEM science concepts. Lectures in STEM sciences provide background information on science concepts while the hands-on, inquiry-based and research-based lab activities are designed to allow students to explore the scientific method as it is applied to CU STEM research. Topics will highlight the interdisciplinary aspect of STEM research.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1460 (1) MASP Coseminar: Introduction to Mcd Biology

Supplements and strengthens student experiences in MCDB 1150 and EBIO 2150. Allows particularly gifted students an opportunity to extend their understanding of the subject and to explore possible careers in science.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1470 (1) MASP Natural Science Seminar

Enhances students' knowledge and appreciation of the natural sciences. Readings, discussions, cooperative learning exercises and outside activities explore the richness of scientific discovery related to core natural science concepts. Emphasizes the scientific method and the history and people making scientific discoveries. Department consent required.

Repeatable: Repeatable for up to 4.00 total credit hours.

ARSC 1480 (1) MASP Social Science Seminar

Fosters an appreciation of the social sciences. Readings, discussions, cooperative learning exercises, and outside activities illustrate the interconnections between different bodies of knowledge. Emphasizes relationships between the social sciences and the real world. Department consent required.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1490 (1) MASP Humanities Seminar

Enhances students' knowledge and appreciation of the humanities. Readings, discussions, cooperative learning exercises, workshopping papers and presentation, guest speakers, and outside activities are designed to enhance both students' appreciation of the subject matter and their performance in their regular courses. Emphasis is on actively using knowledge of humanities in a variety of ways. Department consent required.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1492 (1-3) MASP Research Seminar

Enhances students' knowledge and appreciation of the humanities, the social sciences or STEM-related fields. The course's readings, discussions, cooperative learning exercises, work-shopping papers and presentations, guest speakers, and outside activities are designed to enhance both students' appreciation of the subject matter and their performance in their regular courses. Emphasis will be placed on actively using knowledge of humanities, social sciences or STEM fields in a variety of ways. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 1600 (1) The University of Colorado Experience

Provides an effective transition to the university by giving students a solid base for developing scholarship, citizenship, decision making, and involvement in their university community. Topics include academic and campus resources, safety, health, and diversity.

Additional Information: Departmental Category: Special Curricula

ARSC 1710 (1) SASC Coseminar: Mathematics

Provides motivated pre-calculus students with more in-depth and more challenging coverage of material assumed in calculus. Students complete advanced problems that cannot be covered in pre-calculus courses due to time constraints. Mastery of material is emphasized. Department enforced prerequisite: proficiency in high school mathematics.

Additional Information: Departmental Category: Special Curricula

ARSC 1720 (1) SASC Coseminar: Calculus Work Group

This 1-credit seminar provides motivated calculus students with more in-depth and more challenging coverage of material assumed in calculus. Students complete advanced problems that cannot be covered in calculus courses due to time constraints. Mastery of material is emphasized. Department enforced prerequisites: proficiency in pre-calculus mathematics and an A/B average in pre-calculus sequence. Department enforced corequisite: MATH 1300.

Additional Information: Departmental Category: Special Curricula

ARSC 1800 (3) Methods of Inquiry

Introduces students to methodologies used in different academic disciplines, e.g., how a paleographer dates a manuscript. Course is team-taught. Students must also enroll in two of four corequisite course sections, all in different areas of the core curriculum. The corequisite course sections are listed in the online Schedule Planner.

Additional Information: Departmental Category: Special Curricula

ARSC 2000 (3) Ways of Knowing: Constructions of Knowledge in the Academy and Beyond

Explores different ways of knowing from interdisciplinary, cross-cultural perspectives. Begins with personal interrogations of students' primary learning modes. Examines cultural assumptions about schooling, learning and knowledge, juxtaposing western and eastern philosophies of knowing and looking at how gender, race, class, and other categories of identity shape and interpret concepts of knowledge. Restricted to Norlin Scholars only; department consent required.

Equivalent - Duplicate Degree Credit Not Granted: NRLN 2000

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Special Curricula

ARSC 2274 (3) Peer Counseling

Introduction to basic peer education and counseling theory and techniques. Students learn experientially by practicing a variety of skills in an informal atmosphere. The material learned is valuable to students professionally (as employee or supervisor in any field or as helping professional) regardless of career path. Students increase self-awareness and apply it to their own lives. Offered Fall semesters only.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Special Curricula

ARSC 2400 (1) MASP Coseminar: Organic Chemistry

Supplements and strengthens student experiences in organic chemistry. Allows gifted students an opportunity to extend their understanding of the subject and to explore possible careers in science.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 2470 (1) MASP Coseminar: Physics 1 and 2

Supplements and strengthens student experiences in physics. Allows particularly gifted students an opportunity to extend their understanding of the subjects and to explore possible careers in science.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Miramontes Arts and Sciences Program (MASP)

ARSC 3001 (6) Social Engagement & Human Rights: The South Africa Model

Examines the concept of reconciliation from a multidimensional and multidisciplinary approach as it specifically contributes to subjects of difference,

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Special Curricula

ARSC 3100 (3) Multicultural Perspective and Academic Discourse

Teaches students how to write academic papers related to race, class, gender, sexuality, and other areas of cultural identity. Students acquire expertise on issues through readings, guided discussion, and research and practice oral presentation skills, drafting, and workshopping of papers. Department enforced prerequisite: lower level writing course(s) or waiver.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Writing

ARSC 3600 (3) Diversity Issues: Higher Education

Uses Internet dialogue, computing, and media technology to improve communication and develop research and inquiry skills and critical thinking. Race, class, gender, and sexual orientation issues are addressed to foster understanding of university codes of inquiry and modes of interaction in scholarly communities. Department enforced prerequisite: admission to McNair Program, junior standing, minimum GPA of 2.50, and strong interest in graduate school.

Additional Information: Departmental Category: Special Curricula

ARSC 3650 (3) Diversity Issues in Graduate Education

Guides students through research on diversity and retention issues in graduate education. Participants use Tinto's work on academic and social integration as a conceptual framework. Further, students investigate how specific institutions support diversity goals in their graduate programs. Department enforced prerequisite: admission to McNair Program (minimum 2.50 GPA, three recommendation letters, personal statement, strong interest in graduate school).

Additional Information: Departmental Category: Special Curricula

ARSC 3700 (1-5) McNair Seminar: Research Design

Multidisciplinary course guiding critical thinking as students design a formal investigation. Includes presenting and writing a prospectus. Students revise the prospectus, creating a proposal for funding the research as well as HRC proposals. Department enforced prerequisite: admission to McNair Program (junior standing, minimum GPA of 2.50, and a strong interest in graduate school).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Curricula

ARSC 3935 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Curricula

ARSC 4000 (3) Multimedia Applications in Foreign/Second Language Education

Focuses on knowledge and skills in accessing, evaluating and integrating technology assisted, mediated material in the teaching and learning of foreign languages. Focuses on hands-on design and production of instructional software for foreign languages.

Equivalent - Duplicate Degree Credit Not Granted: ARSC 5000

Recommended: Prerequisite a language-teaching methodology course.

Additional Information: Departmental Category: Special Curricula

ARSC 4040 (1-3) Arts and Sciences Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ARSC 5040

Additional Information: Departmental Category: Special Curricula

ARSC 4700 (1-5) The McNair Seminar: Research Practices and Procedures

Within the range of scholarly modes, student researchers examine discipline-specific rationales for evidence and analysis. Lecturers distinguish popular concepts of investigation from scholarly research. Students learn to take great care describing and discussing methods, findings, interpretations, assertions, and conclusions. Department enforced prerequisite: admission to McNair Program (junior standing, meeting TRIO guidelines, strong interest in graduate school).

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Curricula

ARSC 4750 (3-4) Social Foundations of Professional Life in Washington DC

In this course, students will gain deep exposure to the historical, cultural, and socio-economic traditions and pressures that drive domestic and international policy making in Washington D.C. Students will read widely, prepare papers, and lead discussions on fundamental aspects of Washington's professional life. Course takes place in the nation's capital and is taken in conjunction with a professional internship. Restricted to CU in D.C. program participants.

Additional Information: Departmental Category: Special Curricula

ARSC 4909 (2-6) Senior Thesis for Individually Structured Major

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Curricula

ARSC 4910 (1) McNair Practicum: Principles and Practices of University Teaching

Teaches the core principles of pedagogy at the university level and provides students guidance and feedback on constructing a teaching session in collaboration with a faculty mentor. Using the instructional practices of their discipline, students discuss issues university faculty encounter in their quest toward teaching excellence. The expertise of the Graduate Teacher Program, the Preparing Future Faculty Network and the Faculty Teaching Excellence Program will be drawn upon for supplemental resources, seminars and workshops. Department enforced prerequisite: ARSC 4700 and restricted to McNair Program Students.

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Special Curricula

ARSC 5000 (3) Multimedia Applications in Foreign/Second Language Education

Focuses on knowledge and skills in accessing, evaluating and integrating technology assisted, mediated material in the teaching and learning of foreign languages. Focuses on hands-on design and production of instructional software for foreign languages.

Equivalent - Duplicate Degree Credit Not Granted: ARSC 4000

Recommended: Prerequisite a language-teaching methodology course.

Additional Information: Departmental Category: Graduate-Level Courses

ARSC 5040 (1-3) Arts and Sciences Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ARSC 4040

Additional Information: Departmental Category: Graduate-Level Courses

ARSC 5050 (3) Graduate Seminar on Applied Behavior Science 1

The first part of a two-semester sequence designed to introduce graduate students in the social sciences to interdisciplinary theory, concepts, and methods as applied to important social problems. Department enforced prerequisite: completion of first year of graduate work in a social science department.

Additional Information: Departmental Category: Graduate-Level Courses

ARSC 5060 (3) Graduate Seminar on Applied Behavior Science 2

The second part of a two-semester sequence designed to introduce graduate students in the social sciences to interdisciplinary theory, concepts, and methods as applied to important social problems.

Department enforced prerequisite: ARSC 5050.

Additional Information: Departmental Category: Graduate-Level Courses

ARSC 5823 (3) Internet of Things Embedded Firmware

Acquire firmware development skills to meet low energy and internet connectivity demands of embedded systems. Event driven firmware techniques will be explored through programming assignments, transitioning to programming an Internet of Things RF Network Protocol such as Bluetooth Low Energy or Thread. The coursework will align with the latest industry firmware and embedded wireless protocol trends.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

Asian Studies (ASIA) Courses

ASIA 2000 (3) Gateway to Modern Asia: Exploring Regional Connections

Introduces main themes, intellectual approaches used in Asian Studies through a transdisciplinary perspective that focuses on interactions and links between geographic regions and national boundaries. Presents Asia as a concept, a powerful imaginary geography, and historically dynamic construct that has shaped / been shaped by global patterns of economic development, nation building, war and diplomacy, colonialism and aspirations for better lives.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Asia Content

ASIA 2852 (3) Contemporary Southeast Asia: Environmental Politics

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 2852

Grading Basis: Letter Grade

ASIA 3300 (3) Sex and Gender in Asian Film and Literature

Explores issues of sex and gender in traditional and contemporary Asian cultures by looking at how sex and gendered roles are configured and play out in Asian cultures. Employs film and literary sources which reflect, subvert and act as agents of change in the dominant cultures.

Additional Information: Departmental Category: Asia Content

ASIA 3900 (3) Discovering Urban China: Tradition, Modernity, Nostalgia

Explores the ways Chinese cities, especially Beijing and Shanghai, are depicted in scholarly articles, films, literature and population culture in terms of tradition, modernity and nostalgia. Begins by defining the terms then discusses texts dealing with these themes. Discussions are linked to what the students observe first-hand as they explore the cities. Takes place in China.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

ASIA 4300 (3) Open Topics in Asian Literature and Culture

Examines selected texts on a particular topic. Taught by regular or visiting faculty. Topics change each term.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Asia Content

ASIA 4830 (3) Capstone Seminar in Asian Studies

Participates in a discussion seminar on topics in Asian Studies, conducts research and writes a thesis or creates a project on an approved Asian topic, following guidelines established by the program director. Required for an Asian Studies major.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Asian Studies (ASIA) majors only.

Additional Information: Departmental Category: Asia Content

ASIA 4840 (1-3) Independent Study

Provides an independent study opportunity, by special arrangement with Asian Studies faculty, for students with particular Asian Studies interests.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Asian Studies (ASIA) majors only.

Additional Information: Departmental Category: Asia Content

ASIA 4930 (1-6) Engage Asia: Internship in Asian Studies

Matches students with supervised internships relevant to academic topics in Asian studies. Students work with CAS faculty and internship supervisors, i.e., intern with companies or non-profits doing Asia-related business or project.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Requisite Asian language and culture courses.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

Astrophysical & Planetary Sciences (ASTR)

Courses

ASTR 1000 (3) The Solar System

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1010, but without lab ASTR 1010 or ASTR 1030

Requisites: Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Non-Sequence
MAPS Course: Natural Science

ASTR 1010 (4) Introductory Astronomy 1

Introduction to the night sky, planets, moons and the life in our solar system. Highlights the latest discoveries from space. For non-science majors. Some lectures may be held at Fiske Planetarium. Requires nighttime observations at Sommers-Bausch Observatory.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1000, but with additional lab ASTR 1000 or ASTR 1030

Requisites: Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Lab
MAPS Course: Natural Science Lab or Lab/Lec

ASTR 1020 (4) Introductory Astronomy 2

Non-science majors learn the nature and workings of the Sun, stars, neutron stars, black holes, galaxies, quasars, structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities for nighttime observations at Sommers-Bausch Observatory. Includes recitation. Sequence link ASTR 1010.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1040 and ASTR 1200

Requisites: Requires a prerequisite course of ASTR 1000 or ASTR 1010 (minimum grade C-). Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 1030 (4) Accelerated Introductory Astronomy 1

Covers principles of modern astronomy summarizing our present knowledge about the Earth, Sun, moon, planets and origin of life. Requires nighttime observation sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Like ASTR 1000 and 1010, but taught at a higher intellectual level, including a significant amount of quantitative analysis.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1000 or ASTR 1010

Requisites: Requires prerequisite or corequisite course of MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec
Crse w/ Req Lab
Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Lab

ASTR 1040 (4) Accelerated Introductory Astronomy 2

Covers principles of modern astronomy summarizing our present knowledge about the Sun, stars, birth and death of stars, neutron stars, black holes, galaxies, quasars, and the organization and origins of the universe. May require nighttime observing sessions at Sommers-Bausch Observatory. Required in ASTR major/minor. Includes a recitation. Taught at a higher intellectual level including a significant amount of quantitative analysis.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1020 and ASTR 1200

Requisites: Requires prerequisite course of ASTR 1010 or ASTR 1030 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec
Crse w/o Req Lab
Arts Sci Core Curr: Natural Science Sequence

ASTR 1200 (3) Stars and Galaxies

Non-science majors are introduced to the nature and workings of the Sun, stars, neutron stars, black holes, interstellar gas, galaxies, quasars, plus structure and origins of the universe. Some lectures may be held at Fiske Planetarium. Offers opportunities to attend nighttime observation sessions at Sommers-Bausch Observatory.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 1020 and ASTR 1040

Requisites: Restricted to non- Astronomy (ASTR) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2000 (3) Ancient Astronomies of the World

Documents the numerous ways in which observational astronomy and cosmology have been features of ancient cultures. Includes naked eye astronomy, archaeoastronomy, ethnoastronomy, concepts of time, calendrics, cosmogony, and cosmology.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2010 (3) Modern Cosmology-Origin and Structure of the Universe

Introduces modern cosmology to nonscience majors. Covers the Big Bang; the age, size, and structure of the universe; and the origin of the elements and of stars, galaxies, the solar system, and life.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2020 (3) Space Astronomy and Exploration

Covers physical principles of performing astronomy from space for science and exploration. The basic design of launch vehicles and spacecraft, orbital dynamics, and instruments will be described in the context of specific space missions (e.g. Hubble Telescope, Mars rovers) as well as prospects for future space observatories in orbit and on the Moon.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2030 (3) Black Holes

Black holes are one of the most bizarre phenomena of nature. Students are introduced to the predicted properties of black holes, astronomical evidence for their existence and formation, and modern ideas about space, time, and gravity.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2040 (3) The Search for Life in the Universe

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars. Credit only for this course or ASTR 3300.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 2040

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ASTR 2050 (3) The Sun and Society: Living with an Active Star

Introduces non-science majors to the many ways our Sun influences life and society. Covers how the Sun generates energy, how it evolves over billions of years, how it affects Earth's climate and biology, how it produces dangerous "space weather", how we can harness its power and how life in other solar systems would depend on the properties of their Suns.

Grading Basis: Letter Grade

ASTR 2500 (3) Gateway to Space

Introduces the basics of atmosphere and space sciences, space exploration, spacecraft design, rocketry and orbits. Students design, build, and launch a miniature satellite on a high altitude balloon. Explores the current research in space through lectures from industry.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 1400

Requisites: Restricted to Astrophysics (ASTR) majors only.

ASTR 2600 (3) Introduction to Scientific Programming

Introduces principles, methods and tools of scientific programming commonly used in research. Topics include an introduction to programming in Python, data structures, numerical methods for calculus and data manipulation/visualization. Techniques covered are relevant to many technical fields but emphasis is placed on application to problems in astronomy and planetary science. Class time is split between lectures and in-lab tutorials.

ASTR 2840 (1-3) Independent Study

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

ASTR 3300 (3) Extraterrestrial Life

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science. Credit only for this course or ASTR 2040.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3300

ASTR 3510 (4) Observations and Instrumentation 1

Lab course in astronomical observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, basic optical design and instrumentation and statistical analysis of data, with emphasis on imaging applications. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

Requisites: Requires a prerequisite or corequisite core of APPM 1360 or MATH 2300 and ASTR 1020 or ASTR 1040 and PHYS 1120 (all minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

ASTR 3520 (4) Observations and Instrumentation 2

Lab course in observation and instrumentation. Hands-on exercises include obtaining and analyzing multi-wavelength data, optical design and instrumentation, and statistical analysis, with emphasis on spectroscopy. A significant number of night time observation sessions are required. Elective for APS majors. Elective for APS minors on space available basis.

Requisites: Requires a prerequisite course of ASTR 3510 (minimum grade C-). Restricted to Astrophysics (ASTR) majors only.

ASTR 3560 (3) Astronomical Instrumentation Laboratory

Teaches students aspects of astronomical instrument design in a hands-on setting. Students will learn elementary principles of geometrical optics, diffraction, light detection, signal conditioning, data acquisition and motion control, and mechanical design. Students will apply these principles working in groups to design and build optical spectrometers.

Requisites: Requires prerequisite courses of ASTR 1040 and MATH 2300 or APPM 1360 and PHYS 2170 (minimum grade C-).

Grading Basis: Letter Grade

ASTR 3710 (3) Formation & Dynamics of Planetary Systems

Covers the origin of planetary systems and their dynamical evolution. Topics include the physics and chemistry of planetary formation, orbital mechanics and extrasolar planets. This course and ASTR 3720 and ASTR 3750 may be taken in any order. Elective for APS major and minor.

Requisites: Requires prerequisite course of PHYS 1120 and MATH 2300 or APPM 1360 (all minimum grade C-).

ASTR 3720 (3) Planets and Their Atmospheres

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3720

Requisites: Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

ASTR 3730 (3) Astrophysics 1 - Stellar and Interstellar

Provides a quantitative introduction to the radiative and gravitational physics relevant to stellar and galactic astrophysics, as applied to understanding observations of stars, stellar evolution, stellar remnants and the structure of the Milky Way. Elective for APS major and minor.
Requisites: Requires prerequisite courses of PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

ASTR 3740 (3) Cosmology and Relativity

Special and general relativity as applied to astrophysics, cosmological models, observational cosmology, experimental relativity and the early universe. Elective for APS major and minor.
Requisites: Requires prerequisite courses of PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

ASTR 3750 (3) Planets, Moons, and Rings

Approaches the physics of planets, emphasizing their surfaces, satellites, and rings. Topics include formation and evolution of planetary surfaces, history of the terrestrial planets, and dynamics of planetary rings. This course and ASTR 3720 may be taken for credit in any order. Elective for APS major and minor.
Requisites: Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

ASTR 3760 (3) Solar and Space Physics

Explores the physical processes linking the Sun and planets, emphasizing solar radiative and particulate variability and the response of planetary atmospheres and magnetospheres. Topics include the solar dynamo, solar wind, coronal mass ejections, cosmic ray modulation, magnetospheres, aurora, the space environment, and climate variability. Elective for APS major and minor.
Requisites: Requires prerequisite or corequisite courses of PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).
Recommended: Prerequisite PHYS 3310.

ASTR 3800 (3) Introduction to Scientific Data Analysis and Computing

Introduces scientific data analysis from a practical perspective. Covers statistical analysis, model fitting, error analysis, theoretical compliance and image analysis with examples from space-based and ground-based astronomy. Elective for APS major. Opened to qualified non-majors with instructor consent.
Requisites: Requires prerequisite course of ASTR 2600 and prerequisite or corequisite courses of ASTR 1020 or ASTR 1040 and PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-).

ASTR 3830 (3) Astrophysics 2 - Galactic and Extragalactic

The second semester of a year-long introduction to astrophysical processes. The physical processes developed in ASTR 3730 are applied to topics in extragalactic astronomy, including galaxies, supermassive black holes, galaxy clusters and cosmology. Elective for APS major and minor.
Requisites: Requires prerequisite courses of ASTR 3730 and PHYS 2130 or PHYS 2170 and APPM 2350 or MATH 2400 (all minimum grade C-).

ASTR 4330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.
Equivalent - Duplicate Degree Credit Not Granted: ASTR 5330 and GEOL 4330 and GEOL 5330

ASTR 4500 (1-3) Special Topics in Astrophysical and Planetary Sciences

Topics vary each semester.
Repeatable: Repeatable for up to 9.00 total credit hours.

ASTR 4800 (3) Space Science: Practice and Policy

Exposes students to current controversies in science that illustrate the scientific method and the interplay of observation, theory, and science policy. Students research and debate both sides of the issues, which include strategies and spin-offs of space exploration, funding of science, big vs. small science, and scientific heresy and fraud.
Recommended: Prerequisite one year of college level astronomy or physics.

ASTR 4840 (1-3) Independent Study

Instructor consent required.
Repeatable: Repeatable for up to 6.00 total credit hours.

ASTR 4841 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

ASTR 5110 (3) Atomic and Molecular Processes

Explores the application of quantum physics and statistical mechanics to problems in astrophysics, space physics and planetary science, with an emphasis on radiative processes and spectroscopy of atoms and molecules.
Requisites: Restricted to graduate students only.

ASTR 5120 (3) Radiative and Dynamical Processes

An introduction to radiative and dynamical processes aimed at graduate students in astrophysics, space physics and planetary science. Covers transport phenomena, the macroscopic treatment of radiation fields, magnetohydrodynamics and dynamical processes associated with planetary orbits and N-body systems.
Requisites: Restricted to graduate students only.

ASTR 5140 (3) Astrophysical and Space Plasmas

Teaches magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.
Equivalent - Duplicate Degree Credit Not Granted: PHYS 5141
Requisites: Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

ASTR 5150 (3) Introductory Plasma Physics

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory).
Equivalent - Duplicate Degree Credit Not Granted: PHYS 5150
Requisites: Restricted to graduate students only.

ASTR 5300 (3) Introduction to Magnetospheres

Introduces solar and stellar winds, and planetary and stellar magnetospheres. Acquaints students with the guiding center theory for particle motion, magnetospheric topology, convection, radiation belts, magnetic storms and substorms, and auroras.
Requisites: Restricted to graduate students only.

ASTR 5330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 4330 and GEOL 4330 and GEOL 5330

Requisites: Restricted to graduate students only.

ASTR 5400 (3) Introduction to Fluid Dynamics

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5400

Requisites: Restricted to graduate students only.

ASTR 5410 (3) Fluid Instabilities, Waves, and Turbulence

Involves linear and nonlinear analyses of small-scale waves and instabilities in stratified fluids, with effects of rotation. Studies internal gravity and acoustic waves with terrestrial, planetary and astrophysical applications. Studies thermal and double-diffusive convection, homogeneous and stratified shear flow instabilities. Examines these topics from the onset of small amplitude disturbances to their nonlinear development and equilibration. Department enforced prerequisite: ASTR 5400 or ATOC 5060.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5410

Requisites: Restricted to graduate students only.

ASTR 5540 (3) Mathematical Methods

Presents an applied mathematics course designed to provide the necessary analytical and numerical background for courses in astrophysics, plasma physics, fluid dynamics, electromagnetism, and radiation transfer. Topics include integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations. Draws illustrative examples from the areas of physics listed above.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5540

Requisites: Restricted to graduate students only.

ASTR 5550 (3) Observations, Data Analysis and Statistics

Introduces multi-wavelength observational techniques, their limitations and effects of various noise sources. Describes basic data handling, error analysis, and statistical tests relevant to modeling. Topics include probability distributions, model-fitting algorithms, confidence intervals, correlations, sampling and convolution. Students derive physical measurements and uncertainties with hands-on analysis of real datasets. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

Requisites: Restricted to graduate students only.

ASTR 5560 (3) Radiative Processes in Planetary Atmospheres

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite or corequisite: ASTR 5110.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5560

Requisites: Restricted to graduate students only.

ASTR 5700 (3) Stellar Astrophysics

Explores stellar interiors, evolution and atmospheres, with the Sun and its heliosphere being used as the closest and best-studied example of a star. Covers energy generation, transport, principles of stellar structure, stellar rotation, pulsation and evolution to supernova and compact object stages. Includes radiation transport in stellar photospheres, chromospheres, coronas, winds. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ASTR 5120.

ASTR 5710 (3) High-Energy Astrophysics

Studies astrophysics of UV, x-ray, gamma-ray and cosmic-ray sources, including fundamentals of radiative and particle processes, neutron stars, black holes, pulsars, quasars, supernovas and their remnants; stellar flares; accretion disks; binary x-ray sources; and other cosmic x-ray sources. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5720 (3) Galaxies

Highlights the classification, structure, content, dynamics, and other observational properties of galaxies, active galaxies, and clusters of galaxies. Discusses Hubble's Law, the cosmic distance scale, and the intergalactic medium. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5730 (3) Stellar Atmospheres and Radiative Transfer

Explores stellar atmospheres: basic stellar atmospheres, spectral line formation, interpretation of stellar spectra and model atmospheres. Examines solar physics: the Sun as a star, solar cycle, chromospheric and coronal structure, energy balance, magnetic field and solar wind. Department enforced prerequisites: ASTR 5110 and undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5740 (3) Interstellar Astrophysics

Highlights structure, dynamics and ecology of the interstellar medium, stressing the physical mechanisms that govern the thermal, ionization and dynamic state of the gas and dust; observations at all wavelengths; star formation; relation to external galaxies. Department enforced prerequisite: ASTR 5110.

Requisites: Restricted to graduate students only.

ASTR 5760 (3) Astrophysical Instrumentation

Covers the fundamentals underlying the design, construction and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include Fourier transforms and their applications, optical design concepts, incoherent and coherent signal detection, electronics and applications, and signal acquisition and processing. Department enforced prerequisite: senior level undergraduate physics.

Requisites: Restricted to graduate students only.

ASTR 5770 (3) Cosmology

Studies the smooth universe, including Friedmann-Robertson-Walker metric, Friedmann equations, cosmological parameters, inflation, primordial nucleosynthesis, recombination, and cosmic microwave background. Also studies the lumpy universe, including linear growth of fluctuations, power spectra of CMB and galaxies, dark matter, and large scale flows. Covers galaxy formation and intergalactic medium. Department enforced prerequisite: senior level undergraduate physics or instructor consent will be required.

Requisites: Restricted to graduate students only.

ASTR 5780 (3) Mission Design and Development for Space Sciences

Brings science and engineering students together to develop the multidisciplinary skills required to create a successful proposal to develop a NASA-funded small space mission. Goals: 1) develop the proposal science objectives based on scientific community priorities and NASA Announcement of Opportunity. 2) Understand how science requirements lead to the design of instrumentation. 3) Understand practical aspects of mission development.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5440

Grading Basis: Letter Grade

ASTR 5800 (3) Planetary Surfaces and Interiors

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5800

Requisites: Restricted to graduate students only.

ASTR 5810 (3) Planetary Atmospheres

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5810 and GEOL 5810

Requisites: Restricted to graduate students only.

ASTR 5820 (3) Origin and Evolution of Planetary Systems

Considers the origin and evolution of planetary systems, including proto-planetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5820 and GEOL 5820

Requisites: Restricted to graduate students only.

ASTR 5830 (3) Topics in Planetary Science

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5830 and GEOL 5830

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 5835 (1) Seminar in Planetary Science

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester. Department enforced prerequisite: senior level undergraduate physics.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5835 and GEOL 5835

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 5920 (1-6) Reading and Research in Astrophysical and Planetary Sciences

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 6000 (1) Seminar in Astrophysics

Studies current research and research literature on an astrophysical topic. Students and faculty give presentations. Subjects vary each semester. May be repeated for a total of 4 credit hours to meet candidacy requirements.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

ASTR 6050 (3) Space Instrumentation

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 6050 and GEOL 6050

Grading Basis: Letter Grade

ASTR 6610 (3) Earth and Planetary Physics 1

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6610 and PHYS 6610

Requisites: Restricted to graduate students only.

ASTR 6620 (3) Earth and Planetary Physics 2

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6620 and PHYS 6620

Requisites: Restricted to graduate students only.

ASTR 6630 (3) Earth and Planetary Physics 3

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6630 and PHYS 6630

Requisites: Restricted to graduate students only.

ASTR 6650 (1-3) Seminar in Geophysics

Advanced seminar studies in geophysical subjects for graduate students.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6650 and PHYS 6650

Requisites: Restricted to graduate students only.

ASTR 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

ASTR 6950 (1-6) Master's Thesis**ASTR 7160 (3) Intermediate Plasma Physics**

Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 7160

Recommended: Prerequisite PHYS 5150.

ASTR 7500 (1-3) Special Topics in Astrophysical and Planetary Sciences

Acquaints students with current research in astrophysical and planetary sciences. Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ASTR 7920 (1-6) Reading and Research in Astrophysical and Planetary Sciences

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ASTR 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

ATLAS (ATLS)

Courses

ATLS 1100 (3) Design Foundations

Introduces foundational principles, practices and methods of design. Emphasizes design as an expressive and creative problem solving tool. This course engages with design from a broad perspective including visual, computational, physical and auditory design practices. Through lectures, discussions and creative projects, students will gain a familiarity with the diverse applications of creative technology through design.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors only.

Grading Basis: Letter Grade

ATLS 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an on-line virtual world called Second Life as the "Laboratory" for the course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the student to important ideas and concepts that shape the field of computer science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1220

ATLS 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather on the way in which computing has affected human culture and thought in the past half century.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1240

ATLS 1710 (3) Tools and Methods for Engineering Computing

Designed for students with little or no programming background.

Students learn procedural and object-oriented programming through development of games, simulations, and animations using Flash/Actionscript, VB/Excel, Java, MATLAB, and real-world applications.

Activities are oriented toward smaller projects that address topics in beginning science, engineering, and mathematics courses. Students gain practical, applicable skills.

ATLS 2000 (3) The Meaning of Information Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval.

Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

Equivalent - Duplicate Degree Credit Not Granted: HUEN 2020

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

ATLS 2036 (3) Introduction to Media Studies in the Humanities

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant ready and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2036

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students in the Atlas student group (PATL) only.

ATLS 2100 (3) Image

Introduces techniques, technologies and concepts of digital image making and manipulation through lectures, projects and critiques. Focuses on digital photography, digital animation and digital video as a means to formal and expressive ends. This course also contextualizes practices and methodologies of digital imaging with historical and critical perspectives.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 2200 (3) Web

Introduces techniques, technologies and concepts of web design and development through lectures, projects and critiques. Focuses technically on HTML, CSS and JavaScript as the primary web technologies. Contextualizes the technical and societal implications of the Internet through historical and critical perspectives.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 2300 (3) Text

Introduces technologies, terminology and histories related to the design of text within digital and analogue media. Students will learn the fundamentals of design, typography and layout through lectures, projects and critiques. The curriculum surveys significant theoretical perspectives, historical periods and significant practitioners that influence the practice of typographic design.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 2519 (1-3) Special Topics in Technology, Arts and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 3000 (3) Code

Instructs non-computer science students in analyzing problems and synthesizing programs for the solution, emphasizing good engineering practices for program construction, documentation, testing, and debugging. Uses Java for programming projects. Formerly ATLS 2010.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade D-). Restricted to students in the ATLAS student group (PATL) only.

ATLS 3100 (3) Form

Teaches the fundamentals of 3D modeling, 3D animation and 3D printing / rapid prototyping from a conceptual and sculptural perspective. Through topical lectures, technical demonstrations and creative projects the course will introduce students to the potentials of thinking and working within 3-dimensional spaces.

Requisites: Requires a prerequisite courses of ATLS 2000 (minimum grade C) and CSCI 1300 (minimum grade C-). Restricted to Technology, Arts and Media (TMEN) majors or the PATL student group only.

Grading Basis: Letter Grade

ATLS 3110 (3) Motion

An animation-based projects course that advances student understanding of motion design in today's culture. Through active production and critical analysis, students will create new media projects and critically examine the history, social implications, and impacts of these forms of mass media.

Recommended: Prerequisite ATLS 2100.

ATLS 3112 (1-3) Digital and Social Systems Professional Development

Supports students in developing professional skills and practices in human computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3112

Repeatable: Repeatable for up to 10.00 total credit hours.

ATLS 3173 (3) Creative Climate Communication

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3173 and THTR 4173

Recommended: Prerequisite ENVS 1000.

ATLS 3200 (3) Sound

Introduces techniques, technologies and concepts of digital sound through lectures, projects and critiques. Focuses technically on digital sound creation, production, synthesis and interactivity. Explores various approaches to digital sound production through historical and conceptual perspectives.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Recommended: Prerequisite CSCI 1300.

Grading Basis: Letter Grade

ATLS 3500 (1-3) Client Projects in Technology, Arts and Media

Allows undergraduate students to work on collaborative projects with faculty and with external organizations under faculty supervision.

Focuses on teamwork, conceptual planning, technical design and development and working within real-world client environments. Critical skills include project research, planning, design, development, troubleshooting and presentation.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of ATLS 2000 and ATLS 3010 (all minimum grade C).

Recommended: Prerequisite ATLS 3020.

ATLS 3519 (1-3) Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

ATLS 3529 (1-3) Special Topics in Critical Perspectives in Technology

Analyzes critical perspectives in technology, art, and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4120 (3) Mobile Application Development

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5120

Requisites: Requires prerequisite course of ATLS 3000 or CSCI 1300 (minimum grade C). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4214 (3) Big Data Architecture

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5214

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade D-). Restricted to Technology, Arts and Media (TMEN) majors, Computer Science (CSEN/CSCI) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4230 (3) Case Studies in Information and Communication Technology for Development

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5230

ATLS 4519 (1-4) Advanced Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

ATLS 4529 (1-3) Advanced Special Topics: Critical Perspectives in Technology

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5529

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade D-). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 4630 (3) Web Front-End Development

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, JQuery, HTML5, APIs and user interface design methods to create interactive web applications. Individual and group projects will include animations, games, interactive narratives and web applications.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5630

Requisites: Requires prerequisite courses of ATLS 2200 and ATLS 3000 or CSCI 1300 (all minimum grade C).

ATLS 4809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5809 and CSCI 4809 and CSCI 5809

Requisites: Restricted to students in the Atlas student group (PATL) only.

ATLS 4900 (1-3) Undergraduate Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Students work on research or a creative project guided by faculty. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of ATLS 3010 and 3020 (all minimum grade D-).

ATLS 5120 (3) Mobile Application Development

Provides a comprehensive overview of developing mobile applications using a range of technologies including software developers' kits, object-oriented programming and human interface design principles. Students incorporate leading edge technologies with their own academic pursuits and personal interests to develop mobile applications. Explores the social and cultural effects of app and mobile-based computing.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4120

Grading Basis: Letter Grade

ATLS 5150 (1) Managing Effectively in a Changing Telecommunications Environment

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5150

ATLS 5210 (3) Global Development I

Introduces students to the theories and policy of international development. Examines the role of multilateral agencies, foundations, aid organizations, corporate entities and academia in development as both an industry and a research field. Focuses on development movements and their outcomes, the inter-related nature of development and its effect on policies and programs, and critiques.

Requisites: Restricted to graduate students only.

ATLS 5214 (3) Big Data Architecture

Provides students with a comprehensive survey of technologies used today in the collection, storage, processing, analytics and display of big data. Focuses on cultivating real world skills with students working on semester long projects to execute on a group project.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4214

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade D-). Restricted to Computer Science (CSEN) graduate students only.

Grading Basis: Letter Grade

ATLS 5220 (3) Global Development II

Explores the impact of economic, geographical and social/cultural conditions on development outcomes through standalone course components taught by subject matter experts in region and in residency at ATLAS. Components may include, but are not limited to, development economics, environmental sustainability, public health, climate change, globalization and migration, religion, and gender as these broad themes relate to development.

Requisites: Requires prerequisite courses of ATLS 5210 (minimum grade D-). Restricted to graduate students only.

ATLS 5230 (3) Case Studies in Information and Communication Technology for Development

Serves as foundation course for MS-ICTD program. Students will evaluate case studies across a range of technologies and applications. Students will learn how to match available technologies to human and environmental needs and resources, be introduced to the seminal work and leaders in the field, and discuss the future of ICTD as an emerging area of academic focus.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4230

Requisites: Restricted to graduate students only.

ATLS 5240 (3) Information and Communication Technology for Development Laboratory

Prepares students for the semester-long practicum. Students work in teams to design ICTD interventions that address unique socio-economic and environmental development issues. Teams will design a variety of ICTD interventions, including telehealth and distance education programs, communication networks, and pro-development ICTD policies. Topics will be chosen by teams and guided by program faculty and external domain experts.

Requisites: Requires prerequisite courses of ATLS 5230 (minimum grade D-). Restricted to graduate students only.

ATLS 5250 (3) Fieldwork Methods for ICTD Practitioners

Introduces methods and models that can be employed in ICTD program development and deployment. Examines the applications of participatory research, value-centric design, program scale, cross-disciplinary work, and appropriate monitoring and evaluation. The goal is to build student confidence around existing evaluation toolkits and methods, while advancing multi-method approaches to designing and analyzing ICTD initiatives.

Requisites: Restricted to graduate students only.

ATLS 5380 (3) Future of Video: Technology, Policy, and Economics

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5380

Requisites: Requires prerequisite courses of TLEN 5210 (minimum grade D-). Restricted to graduate students only.

ATLS 5519 (1-3) Advanced Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATLS 5529 (1-3) Advanced Special Topics: Critical Perspectives in Technology

Analyzes critical perspectives in technology, art and media. Within these courses, students will develop vocabularies, theoretical perspectives and critical approaches relevant to technology and its effects on culture and society.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4529

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ATLS 2000 (minimum grade D-). Restricted to Technology, Arts and Media (TMEN) majors or the ATLAS (PATL) student group only.

Grading Basis: Letter Grade

ATLS 5610 (6) Startup Practicum

Presumes that entrepreneurship can be learned through the conception, build, and launch of an original product or service by student teams within a single semester. Immerses students in the daily leadership and innovation challenges of the startup environment and serves as a clinic in thinking, decision making and mental agility that will benefit any area of business—not just startups.

Requisites: Restricted to graduate students only.

ATLS 5620 (3) User Centered Design 1

Emphasizes that user-centered design is the first and primary consideration in the design process. UCD teaches how to design successful interactions from research into users' behaviors, attitudes and expectations via three key elements to designing successful user experiences: 1) Listen, Observe, and Research; 2) Concept and Design for Your Users; 3) Deliver/Launch.

Requisites: Restricted to graduate students only.

ATLS 5630 (3) Front-End Development

Explores interactivity on the web using front-end web development concepts and technologies. Students will work with a range of technologies including JavaScript, jQuery, HTML5, APIs and user interface design methods to create interactive web applications.

Individual and group projects will include animations, games, interactive narratives and web applications.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4630

Requisites: Restricted to graduate students only.

ATLS 5640 (4) Design Thinking

Explores design thinking and how it can be applied conceptually and practically to innovation in areas as diverse as business organization and product development to topics and areas including but not limited to, story, design, UX, interaction design, communication strategy and presentation. Fast-paced, project-based, and immersive, students will work in small teams to discover solutions to real-world problems.

Requisites: Restricted to graduate students only.

ATLS 5650 (3) Introduction to Programming

Provides a hands-on introduction to programming logic, environments, and execution using Ruby as the primary programming language. Covers basic programming principle, syntax, design patterns, and best industry practices while focusing on developing elegant, problem-solving skills through code.

Requisites: Restricted to graduate students only.

ATLS 5660 (3) Creative Code

Exposes students to front-end, web-based design and development processes and best practices. WordPress will be used as the back end CMS. Students will learn how to design and develop using WordPress as a framework. At the end of the semester, students will present a final project to illustrate what they have learned and the logic of their build.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites: exposure to HTML, CSS, JavaScript, PHP and MySQL and previous experience with WordPress for blogging and/or content publication.

ATLS 5670 (3) Content Strategies

Experiments with different frameworks on how to combine messaging with creative to communicate complex ideas, brand story, product, and finally measure success. Gain experience and expertise with the various content types and channels, with an understanding of how to apply them and the capabilities to do so in solving creative and business problems.

Requisites: Restricted to graduate students only.

ATLS 5680 (3) Creative Tech Studio

Emphasizes fundamentally, theoretically, and practically that technology and creativity are not opposing disciplines but rather a dynamic and complementary blending of idea and execution that is iterative and evolving through the dynamic exchange and interaction of ideas and tools. Each Studio will offer a different conceptual challenge, such as using technology to bridge physical and digital environments, game design, or storytelling.

Repeatable: Repeatable for up to 12.00 total credit hours.

Grading Basis: Letter Grade

ATLS 5720 (3) User-Centered Design 2

Expands on techniques and opportunities presented in User-Centered Design 1 with a deeper dive into research and prototyping practices as means to insight into user desires and preference, adoption, and execution of product and branded experiences in a variety of contexts and locations within the global experience economy.

ATLS 5730 (3) Front-End Development 2

Requires that students are proficient in front-end environment and ready for advanced front-end development using these tools - HTML 5, CSS3, JS - on weekly projects, a mid-term project, and a final project. This course develops more robust and elegant uses of the semantic use of elements as well as the benefits of using standards-based, valid code, CSS efficiencies, and JS and its libraries.

ATLS 5740 (3) Design Thinking 2

Presents visual thinking as a complex process that can be supported in every stage using specific design techniques. Provides practical, task-oriented information for designers and software developers charged with design responsibilities, including examples of integrated text and full-color data stories, all of which are robust in principles of "active vision," viewing graphic designs as cognitive tools.

ATLS 5809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 4809 and CSCI 4809 and CSCI 5809

Requisites: Restricted to graduate students only.

ATLS 5900 (1-6) Masters Level Independent Study

Provides opportunities for independent study and research at the Masters level. Students work on research project guided by faculty.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATLS 6519 (1-3) Advanced Special Topics in Technology, Arts, and Media

Analyzes special interest areas of multidisciplinary technology, arts and media research and practice.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATLS 6910 (3-6) Information and Communication Technology for Development Practicum

This practicum allows MS-ICTD students to synthesize what they have learned and test their readiness for a career in ICTD. Practicum assignments are arranged under the supervision of the MS-ICTD Program Director and involve work with a non-governmental organization, development agency or technology/policy entity. Successful completion is required for graduation from the MS-ICTD Program.

Requisites: Requires prerequisite courses of ATLS 5210 and ATLS 5220 and ATLS 5230 and ATLS 5240 and ATLS 5250 (all minimum grade D-).

ATLS 7000 (1) ATLAS Seminar

This student/faculty seminar critically examines issues in technology, media and society from the multiple interdisciplinary perspective of the gathered participants. Topics may include: IT and business, security, ethics, globalization, digital divide, IT and education, human computer interaction and others. Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

ATLS 7800 (2) Online Course Design for the Foreign Languages

Learn about the challenges and affordances of designing online foreign languages courses. Read research articles and book chapters pertaining to instructional design issues and online teaching strategies. Experiment with the latest forms of educational technologies. Students enrolled in the course will design and teach a two-week online language course. Department enforced prerequisite: two years of language teaching experience at the college level.

Grading Basis: Pass/Fail

ATLS 7900 (1-6) Doctoral Level Independent Study

Provides opportunities for independent study and research at the Doctoral level. Students perform independent research under faculty supervision.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Atlas (ATLS) graduate students only.

ATLS 8990 (1-10) Doctoral Dissertation

Approved research conducted under the supervision of members of the graduate faculty. Investigates some specialized topic or field in the area of interdisciplinary information and communication technology. All doctoral students must register for at least 30 hours of dissertation credit as part of the requirement for the ATLAS doctoral degree.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Atlas (ATLS) graduate students only.

Atmospheric & Oceanic Sciences (ATOC)

Courses

ATOC 1050 (3) Weather and the Atmosphere

Introduces principles of modern meteorology for nonscience majors, with emphasis on scientific and human issues associated with severe weather events. Includes description, methods of prediction, and impacts of blizzards, hurricanes, thunderstorms, tornadoes, lightning, floods, and firestorms.

Additional Information: GT Pathways: GT-SC2 -Natural Physical Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Natural Science

ATOC 1060 (3) Our Changing Environment: El Nino, Ozone, and Climate

Discusses the Earth's climate for nonscience majors, focusing on the role of the atmosphere, oceans, cryosphere and land surface. Describes the water cycle, atmospheric circulations and ocean currents, and how they influence global climate, El Nino and the ozone hole. Discusses human impacts from climate change.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 1060

Recommended: Prerequisite ATOC 1050.

Additional Information: Arts Sci Core Curr: Natural Science Sequence

ATOC 1070 (1) Weather and the Atmosphere Laboratory

Illustrates fundamentals of meteorology with laboratory experiments. Covers collection, analysis and discussion of data related to local weather. Uses computers for retrieval and interpretation of weather data from Colorado and across the U.S. Optional lab for ATOC 1050.

Recommended: Prerequisite or corequisite ATOC 1050.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

ATOC 3050 (3) Principles of Weather

Explores the processes that influence middle latitude weather including atmospheric thermodynamics, cloud and precipitation processes, atmospheric dynamics, air masses and fronts, and mid-latitude cyclones. Recitations and homework assignments will allow students to apply these concepts to real weather data through analysis of weather maps, thermodynamics diagrams and conceptual models.

Recommended: Prerequisites ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3070 (3) Introduction to Oceanography

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3070

Recommended: Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3180 (3) Aviation Meteorology

Familiarizes students with a wide range of atmospheric behavior pertinent to air travel: rudiments of aerodynamics; aircraft stability and control; atmospheric circulation, vertical motion, turbulence and wind shear; fronts, clouds and storms.

Recommended: Prerequisite ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3300 (3) Analysis of Climate and Weather Observations

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3301

Recommended: Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENVS 3600 or GEOG 1001 and one semester calculus.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3500 (3) Air Chemistry and Pollution

Examines the composition of the atmosphere and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3151

Recommended: Prerequisite one semester of college-level chemistry or one year of high school chemistry.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3600 (3) Principles of Climate

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3601 and ENVS 3600

Recommended: Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001 or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ATOC 3720 (3) Planets and Their Atmospheres

Explores the physics and chemistry of the atmospheres of Mars, Venus, Jupiter, Saturn, and Titan. Examines evolution of the atmospheres of Earth, Venus, and Mars; and the escape of gases from the Galilean satellites, Titan and Mars; the orbital characteristics of moons, planets, and comets. Uses recent results of space exploration. Elective for APS major and minor.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 3720

Requisites: Requires prerequisite courses of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Astronomy (ASTR) or Atmospheric Oceanic Sciences (ATOC) majors only.

ATOC 4200 (3) Biogeochemical Oceanography

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5200

Recommended: Prerequisites one semester of calculus and one semester of chemistry.

ATOC 4215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5215 and ASEN 4215 and ASEN 5215

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ATOC 4500 (1-3) Special Topics in Atmospheric and Oceanic Sciences

Acquaints students with current research in atmospheres, oceans, and climate. Topics may vary each semester. May be repeated for a total of 9 total credit hours within the degree. Students may register for more than one section of this course in the same semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ATOC 4550 (3) Mountain Meteorology

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5550

Recommended: Prerequisite ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ATOC 4700 (3) Weather Analysis & Forecasting

Utilizing a range of operational weather observations to analyze current weather conditions, providing hands-on experience interpreting observations and relating those observations to the physical principles that govern atmospheric behavior is the course emphasis. It focuses on how to read weather reports, analyze observations, and how to prepare weather maps to analyze current conditions and how to interpret numerical weather forecasts.

Recommended: Prerequisite ATOC 1050 or ATOC 1060 or ATOC 4720 or ATOC major.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ATOC 4710 (3) Introduction to Atmospheric Physics

Provides a fundamental overview of the physics of Earth's atmosphere. Topics include atmospheric composition and structure, atmospheric radiation and optics (rainbows, halos and other phenomena), atmospheric thermodynamics, cloud physics and atmospheric electricity and lightning. Including both descriptive and quantitative approaches to the subject material. Where applicable, observations from the ATOC Skywatch Observatory will be introduced.

Recommended: Prerequisite one year of calculus and one year of physics with calculus.

ATOC 4720 (3) Introduction to Atmospheric Dynamics

Introduces the fundamental physical principles that govern the atmospheric circulations across a range of spatial and temporal scales and provides a quantitative description and interpretation of a wide range of atmospheric phenomena. Topics include atmospheric forces, governing equations, balanced and unbalanced flows, atmospheric waves and mid-latitude cyclones.

Recommended: Prerequisite one year of calculus and one semester of physics with calculus.

ATOC 4730 (3) Physical Oceanography and Climate

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Nino, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5730

Grading Basis: Letter Grade

ATOC 4750 (3) Desert Meteorology and Climate

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5750

Recommended: Prerequisites one semester of calculus and ATOC 1050 or ATOC 1060 or ATOC 3600 or ATOC major.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ATOC 4770 (3) Wind Energy Meteorology

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5770

Recommended: Prerequisite ATOC 1050 or ATOC major.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

ATOC 4800 (3) Policy Implications of Climate Controversies

Examines controversial issues related to the environment, including climate change. Covers scientific theories and the intersection between science and governmental policy. Includes discussion, debate and critical reading of textual materials. Department enforced prerequisite: ATOC 1060 or ATOC 3600.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5000 and ENVS 5830

ATOC 4900 (1-3) Independent Study

Department enforced prerequisite: instructor consent.

Repeatable: Repeatable for up to 6.00 total credit hours.

ATOC 4950 (1-3) Honors Thesis

Students work independently on a research topic under the guidance of a faculty member. A written thesis and an oral presentation of the work are required. Registration by arrangement and with consent of faculty mentor. Department enforced prerequisite: minimum 3.00 GPA.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course

ATOC 5000 (3) Critical Issues in Climate and the Environment

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4800 and ENVS 5830

Requisites: Restricted to graduate students only.

ATOC 5050 (3) Atmospheric Thermodynamics and Dynamics

Covers atmospheric thermodynamics and dynamics and the underlying governing laws and mathematical and physical principles. Topics include atmospheric composition and thermodynamics, conservation laws and atmospheric governing equations, geostrophic balance and balanced flows, vorticity dynamics and boundary layers. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one year of calculus-based physics and math through differential equations.

ATOC 5051 (3) Introduction to Physical Oceanography

Provides fundamental knowledge of observations,, theory, dynamics and modeling in physical oceanography. Promotes critical thinking and the development of skills for data analysis and interpretation. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites one year of calculus-based physics and math up through differential equations.

ATOC 5060 (3) Dynamics of the Atmosphere and Oceans

Examines large-scale motions in a stratified rotating atmosphere and ocean, and quasi-geostrophic flow, barotropic and baroclinic instabilities, cyclogenesis, global circulations and boundary layer processes. Ageostrophic motions, including Kelvin waves, internal gravity waves and the theory of frontogenesis are also considered. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ATOC 5050, one year of calculus-based physics and math up through differential equations.

ATOC 5061 (3) Dynamics of Oceans

Explores theories of the large-scale ocean, including quasigeostrophic, planetary geostrophic and shallow water equations. Topics may vary to focus on ocean climate (e.g. thermocline, westward intensification), ocean waves (e.g. gravity, Rossby, and Kelvin) or ocean models (toy, analytic and numerical).

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites ATOC 5400 and ATOC 5051 or ATOC 5060.

ATOC 5151 (3) Atmospheric Chemistry

Reviews basic kinetics and photochemistry of atmospheric species and stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidation capacity of the atmosphere and global climate change. ATOC graduate core course.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5151

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one semester of college-level chemistry.

ATOC 5152 (3) Advanced Atmospheric Chemistry

Follows Graduate Atmospheric Chemistry (ATOC 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5152

Recommended: Prerequisite CHEM 5151 or ATOC 5151.

Grading Basis: Letter Grade

ATOC 5200 (3) Biogeochemical Oceanography

Provides a large-scale synthesis of the processes impacting ocean biogeochemistry. Transforms theoretical understanding into real-world applications using oceanographic data and models. Topics include: chemical composition, biological nutrient utilization and productivity, air-sea gas exchange, carbonate chemistry, ocean acidification, ocean deoxygenation, iron fertilization, biogeochemical climate feedbacks and more.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4200

Requisites: Restricted to graduate students only.

ATOC 5215 (3) Descriptive Physical Oceanography

Introduces descriptive and dynamical physical oceanography, focusing on the nature and dynamics of ocean currents and their role in the distribution of heat and other aspects of ocean physics related to the Earth's climate. Dynamical material limited to mathematical descriptions of oceanic physical systems.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4215 and ASEN 4215 and ASEN 5215

Requisites: Restricted to graduate students only.

ATOC 5235 (3) Introduction to Atmospheric Radiative Transfer and Remote Sensing

Examines fundamentals of radiative transfer and remote sensing with primary emphasis on the Earth's atmosphere; emission, absorption and scattering by molecules and particles; multiple scattering; polarization; radiometry and photometry; principles of inversion theory; extinction- and emission-based passive remote sensing; principles of active remote sensing; lidar and radar; additional applications such as the greenhouse effect and Earth's radiative energy budget. ATOC graduate core course. Department enforced prerequisites: one year of calculus-based physics, and math up through differential equations.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5235

Requisites: Restricted to graduate students only.

ATOC 5300 (3) The Global Carbon Cycle

Covers the role of the ocean, terrestrial biosphere, and atmosphere in the global carbon cycle. Specific topics include marine carbonate chemistry, biological production, terrestrial fluxes, anthropogenic emissions, and the evolution of the global carbon cycle in a changing climate.

Requisites: Restricted to graduate students only.

ATOC 5400 (3) Introduction to Fluid Dynamics

Covers equations of fluid motion relevant to planetary atmospheres and oceans and stellar atmospheres; effects of rotation and viscosity; and vorticity dynamics, boundary layers and wave motions. Introduces instability theory, nonlinear equilibration and computational methods in fluid dynamics. Department enforced prerequisite: partial differential equations or equivalent.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5400

Requisites: Restricted to graduate students only.

ATOC 5410 (3) Fluid Instabilities, Waves, and Turbulence

Nonlinear waves and instabilities; wave-mean and wave-wave interactions, resonant triads; secondary instability and transition to turbulence; diagnosis, modeling, and parameterization of turbulent flows in geophysics and astrophysics. Department enforced prerequisite: ASTR 5120 or ATOC 5060 or ATOC 5400.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5410

Requisites: Restricted to graduate students only.

ATOC 5540 (3) Mathematical Methods

Applied mathematics course; provides necessary analytical background for courses in plasma physics, fluid dynamics, electromagnetism, and radiative transfer. Covers integration techniques, linear and nonlinear differential equations, WKB and Fourier transform methods, adiabatic invariants, partial differential equations, integral equations, and integrodifferential equations.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5540

Requisites: Restricted to graduate students only.

ATOC 5550 (3) Mountain Meteorology

Investigating main processes that control weather and climate in the western United States and other mountain ranges around the world is the emphasis of this course. Provides an advanced survey of synoptic, mesoscale, and microscale meteorology in complex terrain including orographically modified cyclone evolution, front-mountain interactions, terrain and thermally driven flows, mountain waves, downslope winds, and orographic precipitation.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4550

ATOC 5560 (3) Radiative Processes in Planetary Atmospheres

Application of radiative transfer theory to problems in planetary atmospheres, with primary emphasis on the Earth's atmosphere; principles of atomic and molecular spectroscopy; infrared band representation; absorption and emission of atmospheric gases; radiation flux and flux divergence computations; radiative transfer and fluid motions; additional applications such as the greenhouse effect, inversion methods and climate models. Department enforced prerequisite: ATOC 5235.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5560

Requisites: Restricted to graduate students only.

ATOC 5600 (3) Physics and Chemistry of Clouds and Aerosols

Examines the physics and chemistry of clouds and aerosols in the planetary atmospheres, where they impact climate, atmospheric chemistry, remote sensing and weather. Applies basic microphysical, radiative and chemical processes affecting particles to issues in current literature. ATOC graduate core course.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one semester of college-level chemistry and calculus-based physics and math up through differential equations.

ATOC 5730 (3) Physical Oceanography and Climate

Introduces the field of physical oceanography, with emphasis on the ocean's interaction with the global atmosphere. Analysis of the ocean's heat, salt, and momentum budgets, wind-driven and thermohaline circulations, climate cycles including El Niño, and the ocean's role in climate change. Theory complemented by state-of-the-art observations and models. Department recommended prerequisites: ATOC 1060 or ATOC 3070 or ATOC 3600 and one semester of calculus.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4730

Grading Basis: Letter Grade

ATOC 5750 (3) Desert Meteorology and Climate

Introduces students to the dynamic causes of deserts in the context of atmospheric processes and land-surface physics. Discusses desert severe weather, desert microclimates, human impacts and desertification, inter-annual variability in aridity (drought), the effects of deserts on global climate and the impact of desert climate on humans.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4750

Requisites: Restricted to graduate students only.

ATOC 5760 (3) Astrophysical Instrumentation

Covers the fundamentals underlying the design, construction, and use of instrumentation used for astrophysical research ranging from radio-wavelengths to gamma rays. Topics include: Fourier transforms and their applications; optical design concepts; incoherent and coherent signal detection; electronics and applications; signal acquisition and processing.

Requisites: Restricted to graduate students only.

ATOC 5770 (3) Wind Energy Meteorology

Explores the complex interactions of the atmosphere and wind energy generation. Surveys wind turbine designs. Explores planetary boundary layer dynamics, traditional and novel wind measurement methods, forecasting methods, wind turbine and wind farm wakes, wind farm optimization, sound propagation from wind plants, climate change impacts on wind resources and the impacts of wind plants on local environments.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4770

ATOC 5810 (3) Planetary Atmospheres

Covers the structure, composition, and dynamics of planetary atmospheres. Also includes origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres past and future.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5810 and GEOL 5810

Requisites: Restricted to graduate students only.

ATOC 5820 (3) Origin and Evolution of Planetary Systems

Reviews protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets and asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the orbital evolution of solar system bodies.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5820 and GEOL 5820

Requisites: Restricted to graduate students only.

ATOC 5830 (3) Topics in Planetary Science

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5830 and GEOL 5830

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

ATOC 5835 (1) Seminar in Planetary Science

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5835 and GEOL 5835

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

ATOC 5900 (1-6) Independent Study

Students may register for more than one section of this course in the same semester.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATOC 6020 (1) Seminar in Atmospheric and Oceanic Sciences

Studies an area of current research in the atmospheric and oceanic sciences. Students read selected papers from the literature. Students and faculty give presentations and participate in discussions. May be repeated for a total of 6 credit hours within the degree. May be repeated for a total of 3 credit hours within a semester.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATOC 6100 (3) Modeling Weather and Climate

Discusses background theory and procedures used for modeling climate on a variety of space and time scales. Includes numerical simulation of weather and climate with models in a hierarchy of complexity, assessments of error growth, prediction of circulations and impact of radiative and other influences. Explores various numerical methods, develops core computing skills and considers data handling and visualization. Consists of a combination of lectures and laboratory.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ATOC 5050 or calculus.

ATOC 6700 (1) Weather Forecasting and Discussion

Explores the techniques used to make short-term weather forecasts in the mid-latitudes using real-time weather observations, numerical forecast model output and conceptual models of mid-latitude weather phenomena. Students will be required to develop and defend conceptual models of the short-term evolution of the weather and will conduct detailed post-forecast analysis of successful and unsuccessful forecasts.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite ATOC 5050.

ATOC 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

ATOC 7500 (1-3) Special Topics in Atmospheric and Oceanic Sciences

Acquaints students with current research in atmospheres, oceans, and climate. Topics may vary each semester. Students may register for more than one section of this course in the same semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

ATOC 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Requisites: Restricted to graduate students only.

Baker Residential Acad Prgm (BAKR)

Courses

BAKR 1500 (3) Colorado: History, Ecology, and Environment

Studies the Colorado environment from multiple aspects of history and ecology. Presents historical events in their environmental context and examines lingering environmental consequences. Presents major habitats within Colorado and relates their historical and present uses. Lecture and field trips.

Additional Information: Arts Sci Core Curr: United States Context

BAKR 1600 (3) Creating a Sustainable Future

Explores opportunities for moving toward a sustainable 21st century U.S. society. Evaluates socio-economic institutions, values and forces in late 20th century U.S. society that are unsustainable, given 21st century environmental, economic and social challenges. Contemplates societal progress from reflective perspectives and leading visionaries, including CU-generated documents. Explores actions you can adopt now that empower you to live a more sustainable lifestyle.

Additional Information: Arts Sci Core Curr: Contemporary Societies

BAKR 1800 (3) Exploring Opportunities in the Natural and Environmental Sciences

Engaging students to explore and discover exciting internships, careers, and research opportunities in fields associated with natural science and environmental studies. The class will include seminars, lectures, student presentations, and the exploration of places like the Denver Zoo, natural science museums (Denver and CU campus), Mountain Research Station, Campus Greenhouse, Butterfly Pavillion and Rocky Mountain National Park.

BCOR Applied Semester Experience (BASE)

Courses

BASE 2101 (3) BCOR Applied Semester Experience 1: Early Stage

Builds on material covered in BCOR 2001, BCOR 2002 and BCOR 2003. Provides students the opportunity to apply tools from the functional business disciplines. Business problems, solutions and decisions are addressed in the context of an early stage business.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of BCOR 1030 and BCOR 2001 and BCOR 2002 and BCOR 2003 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

BASE 2102 (3) BCOR Applied Semester Experience 2: Growth Stage

Builds on material covered in BCOR 2001, BCOR 2002 and BCOR 2003. Provides students the opportunity to apply tools from the functional business disciplines. Business problems, solutions and decisions are addressed in the context of a growth stage business.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of BCOR 1030 and BCOR 2001 and BCOR 2002 and BCOR 2003 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

BASE 2103 (3) BCOR Applied Semester Experience 3: Mature Stage

Builds on material covered in BCOR 2001, BCOR 2002 and BCOR 2003. Provides students the opportunity to apply tools from the functional business disciplines. Business problems, solutions and decisions are addressed in the context of a mature stage business.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of BCOR 1030 and BCOR 2001 and BCOR 2002 and BCOR 2003 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

BASE 2104 (3) BCOR Applied Semester Experience 4: Case Project

Focuses on a major business decision requiring interdisciplinary analysis. Students will draw on knowledge and tools learned in other BASE and BCOR courses to analyze the case and present their solution.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of BCOR 1030 and BCOR 2001 and BCOR 2002 and BCOR 2003 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

Biomedical Engineering (BMEN)

Courses

BMEN 2000 (3) Introduction to Biomedical Engineering

Reviews important aspects of biology and develops a basic understanding of the biomedical engineering field. Topics include physiological principles, biomechanics, bioinstrumentation, bioimaging, biotechnology and biomaterials.

Requisites: Restricted to Biomedical Engineering minors only.

Recommended: Prerequisite high school biology.

Grading Basis: Letter Grade

Business Administration (BADM)

Courses

BADM 1250 (1.5) First Year Seminar for Business

Surveys the entire undergraduate experience and includes topics, issues, and practices that focus on the professional, academic, and leadership growth of a business student. It addresses how to make an effective transition to college and puts students on a path to become well-rounded, engaged and globally-minded. Students will acquire the knowledge and skills to take advantage of all the opportunities and support services available to them while learning to balance the challenges and expectations of their business degree. A sample of the topics covered include: transition to college, dealing with academic rigor, developing a professional tool kit—resume and cover letter preparation, interview skills, project management, working in teams and public speaking—and preparing for the role as a global business leader.

Requisites: Restricted to Business (BUSNU) majors only.

Grading Basis: Pass/Fail

BADM 1260 (2) First-Year Global Experience

In today's world of increased mobility, globally aware students have more choices for employment upon graduation and are immediately ready to contribute in global environments. They are aware of global issues and cultural differences, and their global mindset allows them to recognize good ideas from whenever they might come and new market/product opportunities wherever they might exist. This course is the first step toward the development of a global mindset. It provides a meaningful global experience to first-year business students through an in-depth perspective of a specific country or region outside the United States and a short academic trip to the region.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 2010 (1) Excel in Business

Teaches beginner to intermediate level Excel skills, emphasizing efficient use of Excel to make sense of substantial data sets. The course is designed to increase students' proficiency with Excel through a series of hands-on workshops. The workshops have a business problem solving orientation and use real data from Leeds' corporate partners. The workshops emphasize the most important skills that employers value.

Requisites: Restricted to Business (BUSNU) majors only.

Grading Basis: Pass/Fail

BADM 2050 (3) Honors/Special Topics

Variable topics in business, drawing from a variety of disciplines.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: At least a 3.50 cumulative GPA is required.

Additional Information: Arts Sciences Honors Course

BADM 2880 (3) Special Topics

Explores historical developments, contemporary issues, industry trends and best practices pertinent to the business of sports. Examines how sports enterprises are managed and the impacts that such enterprises have on the economic and social fabric of communities. Designed to provide sufficient background for educated consumption of this literature and pursuit of further study if desired.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

BADM 2900 (1-3) Independent Study

Department consent and departmental form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 3100 (1) Professional Development

Designed to provide opportunities to understand and develop professional competencies for successful careers in business. Designed to increase knowledge of job search strategies and formulate a career management plan for transitioning to the workplace. Topics such as resumes, cover letters, personal branding, job search strategies, internships, career choices, networking and social media will be covered. A Self-Marketing Plan will be developed to help focus on long-term career goals.

Requisites: Restricted to Leeds School of Business majors only.

Grading Basis: Pass/Fail

BADM 3880 (3) Special Topics

Introduces students to the many facets of the marketing of sport and marketing through sport. Theoretical and practical applications of marketing sport are examined. Provides students with an understanding of current marketing concepts and best business practices, related to sports enterprises and a foundation for pursuit of further study and work in sports and event marketing.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

BADM 3900 (1) Independent Study

Department consent and departmental form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 3930 (1-6) Internship

Student training and participation in government or industry environment under faculty supervision. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of BCOR 1000 and BCOR 1020 and BCOR 2000 and BCOR 2400 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Pass/Fail

BADM 4820 (1-6) Special Topics

Variable topics in business drawing from a variety of business disciplines.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Business (BUSN) majors with 52-180 units completed.

BADM 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Business Administration.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

BADM 4830 (1-3) Special Topics

Various topics in business and society drawing from a variety of business disciplines.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 4900 (1-3) Independent Study

Intended only for exceptionally well qualified business seniors.

Department form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Business (BUSNU) majors only.

BADM 4910 (2) VITA-Volunteer Tax Assistance

Offers students the opportunity to gain professional work experience in an accounting position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential.

Requisites: Requires prerequisite courses of BCOR 2000 and ACCT 3440 or ACCT 5440 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

Grading Basis: Pass/Fail

BADM 6820 (1-3) Topics in Business Administration

Offered irregularly to provide opportunity to investigate new topics in business administration.

BADM 6900 (3) Mergers, Acquisitions and Reorganizations

Studies the planning of corporate mergers, acquisitions and reorganizations, examining the application and integration of state corporate law, federal securities law, accounting principles, tax law, labor law, products liability law, environmental law, ERISA and antitrust law.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7411

BADM 6910 (3) Law and Finance for Entrepreneurs

Studies unique legal problems faced by entrepreneurs, including formation issues (choice of entity, rights of the founders, initial investors), operation issues (governance, key employees, intellectual property, financing), IPOs and buy-outs.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7451

BADM 6920 (3) Project Management

Presents basic skills required to manage wide range of technical projects. Topics include selecting project alternatives, managing project teams, developing project plan elements, risk management, monitoring and controlling projects, and financial analysis of projects. Students apply skills learned to representative project.

BADM 6930 (3) Commercializing Sustainable Energy Technologies

Addresses the opportunities and problems of commercializing new renewable energy technologies. Focuses on energy markets, opportunity identification, life cycle analysis, policy economics, project financing and economic analysis as they relate to bringing renewable energy technologies to market.

Equivalent - Duplicate Degree Credit Not Granted: ENST 5002

BADM 6940 (3) Land Use Law

Examines Federal, state and local regulations governing land use in the U.S. and surveys the basic principles of urban planning and public finance. Describes basic tools governments use to control land use: Euclidean zoning, nuisance law, police power, eminent domain and takings, Planned Urban Developments, historic preservation, wetlands and flood zones, airports, endangered species, view restrictions, and environmental law.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Business Core (BCOR)

Courses

BCOR 1015 (3) The World of Business

Provides an overview of the nature business in a global economy. In addition to exploring the economic, governmental, social and environmental context in which businesses operate, students will discover how business creates value and takes advantage of opportunities and challenges. Using examples, cases and projects, students will learn about the business functions in an integrated format. Weekly discussion of current events will focus on entrepreneurship, ethics, international business, business and society, and other topics. Formerly BCOR 1010.

Requisites: Restricted to Business majors with less than 52 units.

BCOR 1020 (3) Business Statistics

Covers descriptive statistics, basic probability theory, statistical inference and hypothesis testing, correlation and simple linear regression analysis. Students learn decision making and solving business problems by using data. Uses statistical features of commonly used business spreadsheet software.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2510

Requisites: Requires prereq course of MATH 1071 or ECON 1078 or MATH 1011 or MATH 1150 or MATH 1300 or MATH 2130 or APPM 3310 or APPM 2360 (min grade D-) or an ALEKS math score of 61% or greater. Restricted to BUSN, ADVT or IAFS mjrs only.

BCOR 1025 (3) Data Analysis in Business

Covers sampling concepts, graphical and numerical data summaries, basic probability theory, discrete and continuous probability models, sampling distributions, hypothesis testing, correlation and both simple and multiple regression analysis. Students learn decision making and solving business problems by using data. Uses statistical features of Excel. Course requirements: laptop with Excel 2013 or newer; clickers.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 1020

Requisites: Requires a prerequisite or corequisite course of MATH 1112 or a prerequisite course of MATH 1071 (minimum grade D-). Restricted to Business (BUSN), Advertising (ADVT) or International Affairs (IAFS) majors only.

BCOR 1030 (3) Communication Strategy

Helps develop basic communication skills to prepare you for success in the business world. This communication and social science theory-based, skill-building course is framed in Fiske and Cuddy's person perception theory that all people are perceived on two dimensions, competence and warmth. You will learn how to use communication skills to strategically demonstrate those dimensions.

Requisites: Restricted to Business (BUSN) majors with 0 - 59 units completed.

BCOR 2000 (4) Accounting and Financial Analysis

Builds a basic understanding of how information regarding a firm's resources and obligations is conveyed to decision makers both outside and within the firm.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2002 and BCOR 2200

Requisites: Requires prerequisite course of BCOR1020 or MATH2510 or ECON3818 or APPM3570 or 4570 or CHEN3010 or CVEN3227 or IPHY2800 or MATH4510 or PSCI2075 or PSYC3101 (min grade D-). Restricted to mjrs in BUSN, SPPR-PRO, IAFS, or with a WBE subplan.

BCOR 2001 (3) Principles of Marketing and Management

Focuses on the basic principles of marketing and management. Within the marketing domain, students will be exposed to the role of marketing within a market economy, along with managerial decision making with respect to the marketing mix variables of price, product promotion and distribution. Within the management domain, students will learn how modern businesses compete in the global marketplace by utilizing the knowledge and skills of managers.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2300 and BCOR 2400

Requisites: Requires prerequisite courses of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

BCOR 2002 (3) Principles of Accounting and Finance

Provides students with an overall appreciation for coordinated efforts within the business world. Builds a basic understanding of how information regarding a firm's resources and obligations is conveyed to decision makers outside the firm. Examines the use of the tools in financial forecasting, as well as the valuation of projects and assets in the context of time and risk.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2000 and BCOR 2200

Requisites: Requires prerequisite courses of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

BCOR 2003 (3) Business Law, Ethics and Social Responsibility

Throughout the course students will consider the interconnectedness of law, ethics, values, public policy and regulation. Emphasis will be placed on the importance of individual and organizational responsibility for business. Allows students to consider the relationship between law and ethics in the broader social context, which is necessary to successfully navigate an increasingly complex, global business environment.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 3000

Requisites: Requires prerequisite courses of BCOR 1015 and ECON 2010 and BCOR 1025 or MATH 2510 or PSYC 2111 or PSCI 2075 (all minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

BCOR 2200 (3) Introductory Finance

Emphasizes the concepts and skills needed to make sound financial decisions. Topics include financial statement analysis, time value of money, interest rates, bond valuation and bond markets, stock valuation and stock markets, cost of capital and capital structure, capital budgeting, financial forecasting and working capital management.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2000 and BCOR 2200

Requisites: Requires prereq course of BCOR2000 and BCOR1020 and MATH2510 or 4510 or ECON3818 or APPM3570 or 4570 or CHEN3010 or CVEN3227 or IPHY2800 or PSCI2075 or PSYC3101 (min grade D-). Restricted to BUSN, IAFS, w/WBE subplan and 26-180 units completed.

BCOR 2300 (3) Adding Value with Management

Focuses on how modern business firms compete in the global marketplace by adding value. Examines the value-chain of a firm and how firms use people, organizations, operations, and information systems to compete and win in world markets. Also covers contemporary issues such as total quality management, process reengineering, teams and team building, employee empowerment, and horizontal organizations.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2001 and BCOR 2400

Requisites: Restricted to Business (BUSN) or SPPR-PRO majors, or students with a subplan of WBE only and 26-180 units completed.

BCOR 2400 (3) Fundamentals of Marketing

Examines how activities in organizations provide value to the purchasers of its products and services. Includes gathering information about consumers and competitors through research and information systems, applying knowledge and technology to the design of products and services, communicating information to consumers and organizational units, and pricing and distributing products and services. Also includes issues in global marketing, ethics and diversity, relationship marketing, and integrating marketing with financial analyses.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2001 and BCOR 2300

Requisites: Requires prereq course of BCOR1020 or MATH2510 or 4510 or ECON3818 or APPM3570 or 4570 or CHEN3010 or CVEN3227 or IPHY2800 or PSCI2075 or PSYC3101 (min grade D-). Rstr to BUSN, SPPR-PRO, IAFS, or ADVT majors, students w/WBE subplan and 26-180 units.

BCOR 2500 (3) Introduction to Operations and Information Management

Introduces the processes and information needed to create products and service in a business organization. Explores the importance of managing the transformation of inputs (materials, labor and capital) into outputs (products and services) and how the availability of the right information, at the right time, in the right hands, is critical to making better decisions later.

Requisites: Requires prerequisite course of BCOR 1020 or 1025 or MATH 2510 or 4510 or ECON 3818 or APPM 3570 or 4570 or CHEN 3010 or CVEN 3227 or IPHY 2800 or PSCI 2075 or PSYC 2111 (minimum grade D-). Restricted to Business majors with 13-180 units completed.

BCOR 3000 (3) Business Law, Ethics, and Public Policy

Surveys major topics and case studies in business law, business ethics and government policy. Business law topics include the American legal system, constitutional law, common law, contract principles, criminal and tort law, intellectual property, employment law and personal and real property law. Ethics topics include the philosophy of law, legal versus moral issues, and professional responsibility. Public policy topics include the roles of business and government, types of government intervention and the nature and theory of governmental policy formulation.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 2003

Requisites: Restricted to Business (BUSN) or Spanish (SPPR) majors or students with a subplan of WBE, and 52-180 units completed.

Business Environment & Policy (BPOL)

Courses

BPOL 6940 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

BPOL 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

BPOL 7500 (3) Doctoral Seminar: Strategic Management 1

Provides an overview of the literature, including classic articles and books, in business strategy and policy (strategic management). Brings the student up to date on schools of thought, research issues, and practical applications in strategic management.

Repeatable: Repeatable for up to 6.00 total credit hours.

BPOL 7530 (3) Doctoral Seminar: Strategic Management 2

Continuation of BPOL 7500.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of BPOL 7500 (minimum grade D-). Restricted to Business Administration (BUAD) graduate students only.

BPOL 7560 (3) Entrepreneurship, International Business and Technology Management

Provides doctoral students with an understanding of strategic management and entrepreneurship theory, as applied to international business and technology management literatures. Additionally, students are exposed to research methods in the strategy and entrepreneurship arenas.

Requisites: Requires prerequisite courses of BPOL 7500 and BPOL 7530 (all minimum grade D-).

BPOL 8900 (1-3) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

BPOL 8990 (1-10) Doctoral Thesis

Business Law (BSLW)

Courses

BSLW 4120 (3) Advanced Business Law

Continuation of BCOR 3000. Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

Equivalent - Duplicate Degree Credit Not Granted: BSLW 5120

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

BSLW 4820 (1-3) Topics in Business Law

Experimental course offered irregularly for purpose of presenting new subject matter in business law.

BSLW 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Business Law.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

BSLW 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours.

BSLW 5120 (3) Advanced Business Law

Covers sales and lease transactions, negotiable instruments, creditor rights and bankruptcy, secured transactions, agency, business organizations, protection of property, and other advanced topics in legal and regulatory environments. This course and BCOR 3000 cover the business law topics tested on the CPA exam.

Equivalent - Duplicate Degree Credit Not Granted: BSLW 4120

Requisites: Restricted to Accounting, Finance/Accounting, Information Systems/Accounting, Systems/Accounting Concurrent Degree students or Accounting, Accounting/Taxation or Business Administration (BUAD) graduate students only.

BSLW 6900 (1-6) Independent Study

Requisites: Restricted to Business (BUSN) graduate students only.

Business Minor (BUSM)

Courses

BUSM 2001 (3) Principles of Marketing and Management

Focuses on topics of marketing management and management of the firm, including the means by which firms use the "four P" decision variables of price, place, promotion and product to create value for consumers and the marketplace. In addition, students learn the skills needed to effectively lead and manage individuals and teams, leading to a more effective and efficient workplace. Department enforced prerequisite: any calculus or statistics course.

Requisites: Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

Grading Basis: Letter Grade

BUSM 2002 (3) Financial Accounting and Finance

Focuses on the development and interpretation of companies' external financial reports. Emphasizes the concepts and skills needed to make sound financial decisions. Topics include financial statement development, statement analysis, working capital management, time value of money, sources of financial capital, cost and value of bonds and stocks, and capital budgeting or project analysis. Department enforced prerequisite: any calculus or statistics course.

Requisites: Restricted to students with Business Minor (BUSM-MIN) plan and 12 units completed.

Grading Basis: Letter Grade

BUSM 3001 (3) Managing Innovation in Organizations

Examines the organizational structures that support innovation and organizational change. Creativity and innovation are becoming critical competitive advantages, yet over forty percent of the new products that are launched each year fail in the marketplace. Focuses on the role of effective teamwork in organizations and the tools needed during new product development to improve success.

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (minimum grade D-). Restricted to students with Business Minor (BUSM-MIN) plan.

BUSM 3002 (3) Business and Financial Analytics

Focuses on the use of quantitative tools to interpret and solve important problems in business and finance. Makes extensive use of spreadsheet modeling, analysis and minicases to present material. Targeted at students with an interest in quantitative methods and modeling.

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (minimum grade D-). Restricted to students with Business Minor (BUSM-MIN) plan.

BUSM 3003 (3) New Venture Creation: Intro to Entrepreneurship

Introduces students to the multiple facets of entrepreneurship including the entrepreneurial process and way of thinking. Venture creation involves many key areas including ideation to opportunity recognition to opportunity evaluation to venture planning to exit. Focuses on the ideation and opportunity recognition and evaluation areas of venture creation, utilizing tactics such as rapid prototyping and design thinking.

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (minimum grade D-). Restricted to students with Business Minor (BUSM-MIN) plan.

BUSM 3004 (3) Global Business for Business Minors

Provides a meaningful global experience to business minor students through an in-depth perspective of a specific country or region outside the United States and a short academic trip to the region. Includes in-class work combined with an academic trip to an international location specified each year.

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (minimum grade D-). Restricted to students with Business Minor (BUSM-MIN) plan.

BUSM 3005 (3) Introduction to Real Estate

Surveys a variety of real estate topics including: real estate transaction law, real estate markets and valuation, real estate finance and investments, real estate development, real estate sustainability and real property and asset management. Concentrates on applying economic and finance concepts to real estate problems. Students who are comfortable with fundamental economic principles and with the mathematics of finance will do well in this course.

Equivalent - Duplicate Degree Credit Not Granted: REAL 2010 or REAL 3000

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (all minimum grade D-). Restricted to Business Minor (BUSM-MIN) students only.

BUSM 3006 (3) Leading and Managing Across Cultures in Northern Europe

Explains cultural differences in international management as it covers communication, organizational culture, strategy, negotiation and more in a multidisciplinary context. Gives students the opportunity to understand these topics through visits to companies, organizations and institutions in this region of Europe. These activities will be supplemented by formal lectures before and after meeting with international professionals.

Equivalent - Duplicate Degree Credit Not Granted: INBU 3333

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (all minimum grade D-). Restricted to Business Minors (BUSM-MIN) with a cumulative GPA of 2.50.

BUSM 3007 (3) Business Solutions for the Developing World

Conducted in Panama, the role of large and small businesses, the government, non-profit organizations and social enterprises, including those that support small businesses in developing countries as a means of eliminating poverty will be studied. Students will become immersed in the culture through home stays which will expedite their understanding of community culture, needs and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4005

Requisites: Requires prerequisite courses of BUSM 2001 and BUSM 2002 (all minimum grade D-). Restricted to Business Minors (BUSM-MIN) with a cumulative GPA of 2.50.

BUSM 4001 (3) Professional Business Plan Development

Using a business plan development model, this capstone course integrates the accounting, finance, management and marketing principles learned previously and incorporates social reasonability and values driven leadership. Objectives focus on the development of professional skills, e.g., time management, career management, team building, through a combination of classroom and experiential learning.

Requisites: Requires prerequisite course of BUSM 3001 or BUSM 3002 or BUSM 3003 or BUSM 3004 (minimum grade D-). Restricted to Business Minor (BUSM-Min) majors only.

Career Services (CSVC)

Courses

CSVC 1000 (1) Work Internship

A one credit pass/fail course, opened to students in good academic standing, whose internship employers require that they receive course credit. The student must first seek to obtain academic credit through their major department. Will not count toward degree requirements in any UCB school or college. No appeals for credit toward degrees or for letter grades in the course will be entertained. Because this course does not apply to any degree program, it is not eligible for financial aid.

Repeatable: Repeatable for up to 3.00 total credit hours.

Grading Basis: Pass/Fail

Center for Western Civilization (CWCV)

Courses

CWCV 2000 (3) The Western Tradition

Encourages a historical and critical investigation into the formative influences on what is often called Western culture, including religious, political, social and economic factors, and contemporary interpretations and critiques of these developments and concepts. Designed as the foundation course for the Center for Western Civilization.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Arts Sciences Special Courses

CWCV 4000 (3) Foundations of Western Civilization

Offers in-depth consideration of one or more foundational traditions in Western civilization. Focus changes from semester to semester, but possible topics include the Hebrew Bible, classical Greece, Islam, early Christianity, Persia, and North Africa. Designed as a senior seminar for the certificate in Western Civilization.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Arts Sciences Special Courses

Center of the American West (CAMW)

Courses

CAMW 2001 (3) The American West

Students tour the cultural, social, and natural features of the American West, based on readings and presentations by guest speakers from the CU faculty and from important professions and positions in the West. Designed as the foundation course in the Western American Studies certificate program.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomores).

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: United States Context

CAMW 3939 (1-3) Center of the American West Internship

Work for public and private organizations on projects that enhance the understanding of various Western American topics and issues (environmental, cultural, public policy, etc.), and which foster students' development as community leaders working for a sustainable West.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CAMW 2001.

CAMW 4001 (3) Seminar on the American West

Interdisciplinary capstone seminar for the Western American Studies certificate program. Applies a selected natural science, social science, or humanities topic to the American West and addresses how westerners can make and sustain viable landscapes and communities.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CAMW 2001 and completion of Western American Studies certificate electives.

CAMW 4840 (1-4) Independent Study: The American West

Requisites: Requires prerequisite course of CAMW 2001 (minimum grade B). Restricted to students with 57-180 credits (Junior or Senior).

Central and East European Studies (CEES)

Courses

CEES 1626 (3) Introduction to Central and East European History since 1770

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1626

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Arts Sciences Special Courses

Chemical Engineering (CHEN)

Courses

CHEN 1211 (4) General Chemistry for Engineers

One-semester lecture and recitation course designed to meet the general chemistry requirement for engineering students. Topics include stoichiometry; thermodynamics; gases, liquids, and solids; equilibrium; acids and bases; bonding concepts; kinetics; reactions; and materials science. Examples and problems illustrate the application of chemistry to engineering sub-disciplines. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra. Not recommended for students with grade below B- in CHEM 1021.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1113 or CHEM 1114 or CHEM 1400

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Corequisite CHEM 1221.

CHEN 1300 (1) Introduction to Chemical Engineering

Meets for one lecture per week. Introduces chemical engineering emphasizing history of the profession, curriculum, chemical industry, and industrial chemistry. Includes industry visits, oral presentations, faculty and professional meetings, and development of a goals statement.

Requisites: Restricted to Chemical (CHEN) Engineering or Chemical and Biological (CBEN) Engineering majors only.

CHEN 1310 (3) Introduction to Engineering Computing

Introduces the use of computers in engineering problem solving, including elementary numerical methods. Teaches programming fundamentals, including data and algorithm structure, and modular programming. Software vehicles include Excel/Vba and Matlab. Formerly GEEN 1300 and COEN 1300.

Requisites: Requires prerequisite or corequisite course of APPM 1340 or 1345 or 1350 or MATH 1300 (minimum grade C-). Restricted to College of Engineering majors or Pre-Engineering Arts and Sciences (PREN-COS) students only.

CHEN 2120 (3) Chemical Engineering Material and Energy Balances

Provides a basic understanding of chemical engineering calculations involving material and energy balances around simple chemical processes.

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEN 1310 (formerly GEEN 1300/COEN 1300; all minimum grade C-).

CHEN 2810 (3) Biology for Engineers

Develops a basic understanding of the science of biology, including an introduction to the disciplines of biochemistry, cell organization, metabolism, genetics, genomics, molecular biology, recombinant DNA technology and evolution. Provides a basic introduction to several key techniques used in biological engineering laboratories. Uses examples of complex and creative structures engineered by natural processes.

CHEN 2840 (1-4) Independent Study

Available to sophomores with approval of Department of Chemical Engineering. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours.

CHEN 3010 (3) Applied Data Analysis

Teaches students to analyze and interpret data. Topics include engineering measurements, graphical presentation and numerical treatment of data, statistical inference, and regression analysis.

Requisites: Requires prerequisite course of CHEN 1310 (formerly GEEN 1300/COEN 1300) and APPM 2360 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

CHEN 3200 (3) Chemical Engineering Fluid Mechanics

Introduces fluid mechanics and momentum transfer, emphasizing the application of these principles to chemical engineering systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 3313 and GEEN 3853 and MCEN 3021

Requisites: Requires prerequisite courses of APPM 2350 (min grade C-) or MATH 2400 (min grade C-) and CHEN 2120 (min grade C-) or MCEN 2023 (min grade C). Requires corequisite course of APPM 2360. Restricted to College of Engineering majors only.

CHEN 3210 (3) Chemical Engineering Heat Transfer

Examines conservation and transfer of thermal energy. Focuses on conduction and convection of heat in the context of chemical processes, with a special focus on heat exchangers. Also studies thermal radiation.

Requisites: Requires prerequisite course of either CHEN 3200 or MCEN 3021 (minimum grade C-). Restricted to College of Engineering majors only

CHEN 3220 (3) Chemical Engineering Separations and Mass Transfer

Studies separation methods including distillation, absorption, and extraction, and graphical and computer-based solutions to separation problems. Also studies mass transfer rate processes, including diffusion, microscopic material balances, and correlations for mass transfer coefficients. Applies mass transfer rate theory to packed and tray columns.

Requisites: Requires prerequisite courses of CHEN 3210 or MCEN 3022 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 3320 (3) Chemical Engineering Thermodynamics

Applies thermodynamic principles to nonideal systems, phase equilibrium, chemical equilibrium, power generation, refrigeration, and chemical processes.

Requisites: Requires prerequisite courses of CHEN 2120 (minimum grade C) and CHEN 4521 or CHEM 4511 and CHEM 4531 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 3660 (3) Energy Fundamentals

Explains the most important energy technologies and systems; provides tools to analyze performance using science and engineering principles. This course will investigate important energy concepts from sources and extraction to utilization, storage and efficiency. Topics include fossil fuels, hydropower, renewable energy, biofuels, carbon capture and waste disposal.

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and PHYS 1110 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering majors only.

Grading Basis: Letter Grade

CHEN 3840 (1-4) Independent Study

Available to juniors with approval of the Department of Chemical Engineering. Subject arranged to fit needs of the student.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 3930 (6) Chemical Engineering Cooperative Education

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program. 00 GPA or higher.

Requisites: Requires prerequisite course of CHEN 2120 (minimum grade C). At least a 2.85 cumulative GPA is required. Restricted to College of Engineering majors only.

Recommended: Prerequisite 3.

CHEN 4010 (2) Chemical Engineering Senior Thesis 1

Provides an opportunity for advanced students to conduct exploratory research in chemical engineering.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 4020 (2) Chemical Engineering Senior Thesis 2

Continuation of CHEN 4010. This course and CHEN 4020 can substitute for CHEN 4130.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 4090 (1) Undergraduate Seminar

Provides chemical engineering career and professional information, facilitates contact with faculty and industry representatives, and improves communication and leadership skills. Consists of a series of seminars and field trips and requires a research project involving a written and oral report.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

CHEN 4130 (3) Chemical Engineering Laboratory

Involves planning and execution of chemical engineering experiments on mass transfer operations, separations, and chemical reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports, and oral presentations.

Requisites: Requires prerequisite courses of CHEN 3010 and CHEN 3220 and CHEN 3320 and CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4330 (3) Chemical Engineering Reaction Kinetics

Introduces chemical kinetics and chemical reactor design. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, and multiple steady states in reactors.

Requisites: Requires prerequisite courses of CHEN 3320 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4440 (3) Chemical Engineering Materials

Introduces materials engineering, including properties of polymers, metals, ceramics, and semiconductors, especially as related to chemical engineering processes.

Requisites: Requires prerequisite courses of CHEN 3320 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4450 (3) Polymer Chemistry

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5450

Requisites: Requires prerequisite courses of CHEN 4830 or CHEN 4330 and CHEM 3311 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4460 (3) Polymer Engineering

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5460

Requisites: Requires prerequisite courses of CHEM 3311 and CHEN 3320 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4520 (3) Chemical Process Synthesis

Studies applied chemical process design including equipment specification and economic evaluation.

Requisites: Requires prerequisite courses of CHEN 3010 and CHEN 3210 or MCEN 3022 and CHEN 3220 and CHEN 4330 or CHEN 4830 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4521 (3) Physical Chemistry for Engineers

Examines the laws of classical thermodynamics followed by physical transformations of pure substances, the thermodynamics of simple mixtures and chemical equilibrium. Applies quantum theory to atomic and molecular structure. Presents the concepts and applications of statistical thermodynamics. Introduces rates of chemical reactions, reaction dynamics and catalysis.

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires a corequisite course of APPM 2360. Restricted to College of Engineering majors only.

CHEN 4530 (2) Chemical Engineering Design Project

Provides a team-based capstone design experience for chemical engineering students. Projects are sponsored by industry and student design teams collaborate with industrial consultants. Projects consider chemical process and product design with emphasis on economic analysis. Deliverables include an oral mid-project design review, a final oral presentation and final written design report.

Requisites: Requires prerequisite course of CHEN 4520 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4570 (4) Instrumentation and Process Control

Examines principles of control theory and their application to chemical processes. Focuses on single-loop feedback and feedforward control. Laboratory sessions cover measurement fundamentals, signal transmission, dynamic testing, control system synthesis, and implementation and adjustment.

Requisites: Requires prerequisite courses of CHEN 3220 and CHEN 4330 or CHEN 4830 and APPM 2360 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4630 (1) Intellectual Property Law and Engineering

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5630

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 4650 (3) Particle Technology

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5650

Requisites: Requires prerequisite courses of APPM 2360 and CHEN 3200 or MCEN 3021 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4801 (3) Pharmaceutical Biotechnology

Focuses on the engineering needed to bring therapeutic products derived from living organisms (e.g., proteins, peptides, DNA, RNA) from the production plant to the patient. Covers the challenges of keeping these products "active" as they are stored, shipped, and administered to patients.

Requisites: Requires prerequisite courses of CHEN 3320 and prerequisite or corequisite courses of CHEN 4830 or CHEN 4330 (all minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4802 (3) Tissue Engineering and Medical Devices

The purpose of this course is to develop a basic understanding of quantitative and qualitative aspects of tissue engineering and medical devices. Particular emphasis will be placed on topics of potential importance and significance to chemical and biological engineers. Students will be introduced to important professional, societal and entrepreneurial issues in the field by examining case studies in which drugs and medical products have been developed or are being considered for FDA approval and clinical use.

Requisites: Requires prerequisite course of CHEN 2810 or MCDB 1150 or EBIO 1210 and EBIO 1220 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

CHEN 4803 (3) Metabolic Engineering

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5803

Requisites: Requires prerequisite course of CHEM 4700 or CHEM 4611 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4805 (3) Biomaterials

Provides an overview of biomaterials. Covers major classes of materials used in medical applications, properties, degradation mechanisms, and characterization methods, foreign body response, methods to control physiological response to biomaterial surfaces, biocompatibility, biomaterials used in soft and hard tissue replacements, drug delivery devices and tissue engineering, and design criteria for developing a material for a given biological application.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5805

Requisites: Requires a prerequisite course of CHEN 2810 or MCDB 1150 or EBIO 1220 and 1230 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4810 (3) Biological Engineering Laboratory

Involves planning and execution of chemical engineering experiments on mass transfer operations, bioseparations, and biological reactors. Interprets experimental data with theoretical principles and statistical analysis. Emphasizes communication with written memos, full reports and oral presentations.

Requisites: Requires prerequisite courses of CHEN 2810 or MCDB 1150 and CHEN 3010 and CHEN 4830 (all minimum grade C-). Requires a corequisite course of CHEN 4820. Restricted to College of Engineering majors only.

CHEN 4820 (3) Biochemical Separations

Lect. and lab. Presents purification methods, mass transfer coefficients, problems specific to biologicals, and scale-up of processes. Also covers chromatography, phase extraction, supercritical fluids, sedimentation, precipitation, electrophoresis, dialysis, affinity techniques, cell separation, application of separations to bioreactors, and comparison of batch and continuous processes.

Requisites: Requires prerequisite course of CHEN 3220 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4830 (3) Chemical Engineering Biokinetics

Introduces chemical kinetics, chemical reactor design, and biological kinetics. Involves mass and energy balances for steady-state and transient reactor systems. Also covers residence time distribution, mass transfer, catalytic reactions, multiple steady states in reactors, enzyme kinetics, metabolic networks, and cell growth kinetics.

Requisites: Requires prerequisite course of CHEN 3320 (minimum grade C-). Restricted to College of Engineering majors only.

CHEN 4836 (3) Nanomaterials

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 5836

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 4838 (1-3) Special Topics in Chemical Engineering

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 4840 (1-4) Independent Study

Available to seniors with approval of chemical engineering department. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

CHEN 5090 (1) Seminar in Chemical Engineering

Required of all chemical engineering graduate students. Includes reports on research activities and on special current topics.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

CHEN 5127 (3) Applied Statistics for the Manufacturing and Process Industries

Discusses the concepts and techniques of applied statistics essential to quality control and product/process improvement. Includes computer control (SQC/SPC), sampling methods and time series analysis, and methods of experimental design.

Requisites: Requires prerequisite course of MCEN 4120 (minimum grade D-).

CHEN 5128 (3) Applied Statistics In Research and Development

Students learn current and emerging statistical methods that are appropriate to experimentation in research and development activities. Statistical design of experiments and model fitting is emphasized. Department enforced prereq.: one introductory probability/statistics course.

CHEN 5210 (3) Transport Phenomena

Considers continuum mechanics, emphasizing fundamental relationships for fluid mechanics and heat transfer and their applications to engineering problems. Department enforced prerequisites: undergraduate courses in fluid mechanics, heat transfer, and differential equations.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

CHEN 5333 (3) Research Methods and Ethics

Prepares graduate students to carry out independent research. Research ethics, laboratory skills, experimental methods, critical thinking, presentations, proposal preparation and career planning are discussed. Independent research project carried out under direction of chemical engineering faculty.

Requisites: Restricted to graduate students only.

CHEN 5343 (1) Research Methods and Ethics Seminar

Prepares graduate students to carry out independent research. Focuses on topics such as safety, ethics, communication skills, data analysis, intellectual property considerations, and time management.

Requisites: Restricted to graduate students only.

CHEN 5360 (3) Catalysis and Kinetics

Studies principles of chemical kinetics and catalytic reactions, emphasizing heterogeneous catalysis.

Requisites: Requires corequisite course of CHEN 4330. Restricted to Chemistry (CHEM) or Chemical Engineering (CHEN) graduate students only.

CHEN 5370 (3) Intermediate Chemical Engineering Thermodynamics

Reviews fundamentals of thermodynamics, application to pure fluids and mixtures, and physical equilibrium and changes of state. Examines the equation of state and computation of fluid properties for pure fluids, mixtures and solutions. Also looks at relations between thermodynamics and statistical mechanics. Department enforced prerequisite: an undergraduate course in chemical thermodynamics.

Requisites: Restricted to graduate students only.

CHEN 5390 (3) Chemical Reactor Engineering

Studies ideal and nonideal chemical reactors, including unsteady state behavior, mixing effects, reactor stability, residence time distribution and diffusion effects. Department enforced prerequisite: undergraduate course in chemical reactor design/kinetics.

CHEN 5420 (3) Physical Chemistry and Fluid Mechanics of Interfaces

Covers thermodynamics of interfaces and surface tension measurement; adsorption at liquid-gas, liquid-liquid, and solid-gas interfaces; monolayers; conservation equations for a fluid interface; rheology of interfaces; surface tension driven flows; contact angle and wettability; and double layer phenomena.

Requisites: Requires prerequisite course of CHEN 3200 (minimum grade D-).

CHEN 5450 (3) Polymer Chemistry

Introduces polymer science with a focus on polymer chemistry and polymerization reactions. Focuses on polymerization reaction engineering and how polymer properties depend on structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4450

CHEN 5460 (3) Polymer Engineering

Introductory polymer engineering course reviewing basic terminology and definitions; the properties and synthetic routes of important industrial polymers; and processing of polymers and their applications.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4460

CHEN 5630 (1) Intellectual Property Law and Engineering

Learn the fundamentals of the various types of intellectual property, obtain the ability to search the USPTO database for patents, learn the difference between provisional patents, utility patents and foreign patents and learn the timing requirements related to the filing of patents and public disclosure, use, and/or sale of an invention.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4630

Requisites: Restricted to graduate students only.

CHEN 5650 (3) Particle Technology

Aims to identify the important physical mechanisms occurring in processes involving particles, formulate and solve mathematical descriptions of such processes, and analyze experimental and theoretical results in both a qualitative and quantitative manner. Teaches students to apply this knowledge to the design of particulate systems. Conveys the breadth and depth of natural and industrial applications involving particulates. Extra work required for graduate course.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4650

CHEN 5670 (3) Environmental Separations

Lect. Covers traditional, as well as new, chemical separations processes that have environmental applications. Includes chemically benign processing (pollution prevention) as well as approaches to address existing pollution problems.

CHEN 5740 (3) Analytical Methods in Chemical Engineering

Presents applied analytical and numerical mathematical methods in the context of chemical engineering problems. Topics include modeling techniques, algebraic equations, and ordinary and partial differential equations. Department enforced prerequisite: working knowledge of computing, calculus, differential equations, linear algebra, and vector operations; and undergraduate courses in physics, fluid mechanics, heat transfer, and reaction engineering.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

CHEN 5750 (3) Numerical Methods in Chemical Engineering

Covers numerical methods for solving ordinary differential, partial differential, and integral equations. These principles are employed to develop, test, and assess computer programs for solving problems of interest to chemical engineers.

Requisites: Restricted to graduate students only.

CHEN 5800 (3) Bioprocess Engineering

Reviews the recent developments in the fields of microbiology, molecular genetics, and genetic engineering that are of commercial value and benefit to mankind. Covers engineering implementation of such biological processes.

CHEN 5803 (3) Metabolic Engineering

Introduces basic concepts in metabolic engineering and explores modern approaches in metabolic and strain engineering. Application areas that will be discussed will include the use of metabolic engineering approaches in biofuels and biorefining as well as biopharmaceutical production.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4803

Requisites: Requires prerequisite courses of APPM 2360 and CHEM 4731 or CHEM 4611 (all minimum grade C-).

CHEN 5805 (3) Biomaterials

Provides an overview of biomaterials. Covers major classes of materials used in medical applications, properties, degradation mechanisms, and characterization methods, foreign body response, methods to control physiological response to biomaterial surfaces, biocompatibility, biomaterials used in soft and hard tissue replacements, drug delivery devices and tissue engineering, and design criteria for developing a material for a given biological application.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4805

Requisites: Restricted to graduate students only.

CHEN 5830 (1) Introduction to Modern Biotechnology

Introduces students to the biotechnology enterprise. Topics include the biotechnology industry and profession, the various academic disciplines of biotechnology, intellectual property, financing, and ethics.

CHEN 5831 (2) Biotechnology Case Studies

Capstone course required of all graduate students in the interdisciplinary graduate biotechnology certificate program. Reviews molecular genetics, product synthesis and purification, economics, intellectual property, and business planning. Working in teams, students present a biotechnology product plan.

Requisites: Requires prerequisite course of CHEN 5830 (minimum grade D-).

CHEN 5835 (3) Colloids and Interfaces

Provides a deep exploration of the fundamental principles of colloid and interface science and of related applications. Core topics include fundamental equations of interfacial science, capillary phenomena, interfacial thermodynamics interfaces, molecular monolayers, electrical surface properties, and interfacial forces. Advanced topics include wetting phenomena, adsorption isotherms, dynamic interfacial behavior, surface modification, tribology, surfactant self-assembly, and foams/emulsions among others.

Requisites: Requires prerequisite course of CHEN 3320 (minimum grade C-).

CHEN 5836 (3) Nanomaterials

Presents fundamental chemical and physical concepts that give rise to the unique optical, electronic and magnetic properties of nanoscale materials. Introduces important synthetic routes for producing nanomaterials, and interparticle forces governing colloidal behavior and self-assembly. Discusses current and potential applications in catalysis, biomedicine, renewable energy, and other fields.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 4836

Requisites: Restricted to graduate students only.

CHEN 5838 (1-3) Special Topics in Chemical Engineering

Graduate-selected topics courses offered upon demand.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CHEN 5840 (1-4) Independent Study

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CHEN 5900 (3) Pharmaceutical Biotechnology

Incorporates biochemistry, pharmaceutical science, and engineering for application in the pharmaceutical industry. Emphasizes microscale mechanisms affecting drug delivery, bioavailability, and stability. Specific topics include thermodynamics of macromolecular conformational stability, crystallization kinetics, interfacial phenomena, and industrial protein folding.

Requisites: Restricted to graduate students only.

CHEN 5919 (1-5) Special Topics in CHBE

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEN 6210 (3) Microhydrodynamics of Suspensions and Colloids

Focuses on fluid mechanics and colloid science of suspensions of particles, cells, and drops. Covers fundamentals, applications, and research frontiers.

Requisites: Requires prerequisite course of CHEN 5210 (minimum grade D-).

CHEN 6820 (3) Biochemical Engineering Fundamentals

Covers design and operation of fermentation processes, microbial and enzyme kinetics, multiple substrate and multiple species of fermentation, regulation of enzyme activity, energetics of cellular growth, immobilized enzyme and cell reactors, and transport phenomena in microbial systems and downstream processing.

Requisites: Restricted to Chemistry (CHEM), Chemical Engineering (CHEN) or Biological Sciences (MCDB) graduate students only.

CHEN 6940 (1) Master's Candidate

Grading Basis: Pass/Fail

CHEN 6950 (1-6) Master's Thesis**CHEN 8990 (1-10) Doctoral Thesis**

Chemistry (CHEM)

Courses

CHEM 1011 (3) Environmental Chemistry 1

Lect. Introduces basic principles of chemistry with applications to current environmental issues including toxic chemicals, air and water pollution, energy sources and their environmental impact, and climate change resulting from the greenhouse effect. No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Chemistry

MAPS Course: Physics

CHEM 1021 (4) Introductory Chemistry

Lect. and lab. For students with no high school chemistry or a very weak chemistry background. Remedies a deficiency in natural science MAPS requirements and prepares students for CHEM 1113 and CHEM 1114.

No credit given to chemistry or biochemistry majors for this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher. Department enforced prerequisite: one year high school algebra or concurrent enrollment in MATH 1011.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

CHEM 1031 (4) Environmental Chemistry 2

Lect. and lab. Applications of chemical principles to current environmental issues including acid rain, stratospheric ozone depletion, the Antarctic ozone hole, solar energy conversion and fuel cells, and the environmental consequences of nuclear war. Laboratory experience is included. No credit given to chemistry or biochemistry majors this course if students already have credit in any college-level chemistry course numbered 1113/1114 (formerly 1111) or higher.

Requisites: Requires prerequisite course of CHEM 1011 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

CHEM 1113 (4) General Chemistry 1

Lect., rec. Intended for first-semester students whose academic plans require advanced work in chemistry. Subjects: components of matter, stoichiometry, classes of reactions, gases, thermochemistry, atomic structure, electron configuration, chemical bonding, molecular shapes, covalent bonding, organic compounds, intermolecular forces, equilibrium. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1114. Not open to engineering students with exception of EPEN majors.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1400 or CHEM 1221 or CHEN 1211

Requisites: AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

CHEM 1114 (1) Laboratory in General Chemistry 1

Lab. Intended for first-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1113. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (min grade C-); high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisites: CHEM 1113. Not open to engineering students with exception of EPEN majors.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1400 or CHEM 1221 or CHEN 1211

Requisites: AMEN, AREN, ASEN, CHEN, CSEN, CVEN, ECEN, EEEN, EVEN, MCEN, OPEN or CBEN majors are not allowed to take this class.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

CHEM 1133 (4) General Chemistry 2

Lect., rec. Intended for second-semester students whose academic plans require advanced work in chemistry. Subjects: acid-base equilibria, buffers and titrations, thermodynamics, redox reactions, electrochemistry, transition elements and their coordination compounds, solubility/solubility equilibria, crystal field theory, kinetics, nuclear chemistry. Department enforced corequisite: CHEM 1134.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 2100

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

CHEM 1134 (1) Laboratory in General Chemistry 2

Lab. Intended for second-semester students whose academic plans require advanced work in chemistry. Instruction in experimental techniques which coordinate with lecture topics in CHEM 1133. Department enforced corequisite: CHEM 1133.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 2100

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 or CHEM 1400 and CHEM 1401 (formerly CHEM 1251) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

CHEM 1221 (1) Engineering General Chemistry Lab

Meets general chemistry laboratory requirement for engineering students. Designed to illustrate chemical concepts and introduce basic techniques in chemical measurement and synthesis. Department enforced prerequisites: one year of high school chemistry or CHEM 1021 (min. grade C-) and high school algebra; B- in CHEM 1021 recommended.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1113 or CHEM 1114 or CHEM 1400

Requisites: Requires prerequisite course of CHEN 1211 or CHEM 1133 (minimum grade C-), or corequisite course of CHEN 1211 or CHEM 1133. Restricted to undergraduate engineering students only.

CHEM 1400 (4) Foundations of Chemistry

Covers core concepts in chemistry: nature of matter (atomic and molecular structure, bonding and macroscopic properties), transformations of matter (chemical reactivity), and quantifying chemical transformations (thermochemistry, thermodynamics and kinetics). Emphasizes critical thinking and cultivate core problem solving skills utilized by scientists. Intended for first semester CHEM/BCHM majors. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grad C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1401. Formerly CHEM 1251.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1113

Requisites: Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

CHEM 1401 (1) Foundations of Chemistry Lab

Coordinates with lecture topics in CHEM 1400. Intended for first-semester CHEM and BCHM majors. Emphasizes the development of hands-on practical laboratory skills, experimental design, data interpretation, problem solving and open inquiry. Department enforced prerequisites: one year high school chemistry or CHEM 1021 (minimum grad C-) and high school math through pre-calculus. Not recommended for students with grades below B- in CHEM 1021. Department enforced corequisite: CHEM 1400.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1114 or CHEM 1400

Requisites: Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Lab

CHEM 2100 (4) Chemical Energetics and Dynamics

Covers the energetic principles that determine when chemical reactions occur and the dynamic principles that determine how rapidly they will occur. Applications include ionic equilibria in solution (acids and bases, buffers and titrations), oxidation-reduction reactions, electrochemistry and chemical kinetics. These applications will be situated in a context of current research problems in areas such as renewable energy and atmospheric chemistry. Department enforced corequisite: CHEM 2101. Formerly CHEM 1271.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 1133

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and MATH 2300 or APPM 1360 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
Arts Sci Core Curr: Natural Science Lab

CHEM 2101 (1) Laboratory for Chemical Energetics and Dynamics

Coordinates with the lectures topics in CHEM 2100. Required for fourth semester CHEM majors and an elective for BCHEM majors. Emphasizes the acquisition of more advanced laboratory skills, experimental design, data interpretation and analysis. Department enforced corequisite: CHEM 2100.

Requisites: Requires a prerequisite course of CHEM 3341 or CHEM 3381 (minimum grade C-).

Grading Basis: Letter Grade

CHEM 3151 (3) Air Chemistry and Pollution

Examines the composition of the atmosphere, and sources of gaseous and particulate pollutants: their chemistry, transport and removal from the atmosphere. Applies general principles to acid rain, smog and stratospheric ozone depletion. Department enforced prerequisite: two semesters of chemistry.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3500

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

CHEM 3251 (3) Sustainable Energy from a Chemistry Perspective

Explores qualitative and quantitative chemical aspects of energy systems (production, transmission, storage, utilization) including fossil, wind, solar, nuclear and biomass energy. Applies chemical principles including composition, structure, bonding, physical properties, thermodynamics, equilibrium and kinetics to energy systems and sustainability, especially environmental implications. Describes the importance of energy to the chemical industries and society as a whole.

Requisites: Requires prerequisite course of CHEM 1133 and 1134 or CHEM 2100 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

CHEM 3311 (4) Organic Chemistry 1

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkanes, alkenes, alkynes, alkyl halides, and aromatic molecules; nomenclature of organic compounds; stereochemistry; reaction mechanisms and dynamics. Department enforced corequisite: CHEM 3321 or CHEM 3361.

Requisites: Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 1400 and CHEM 1401 or CHEM 2100 (formerly CHEM 1271) or CHEN 1211 and CHEM 1221 (all minimum grade C-).

CHEM 3321 (1) Laboratory in Organic Chemistry 1

Lab. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, and aromatic compounds. Stereochemical modeling and the identification of organic unknowns by spectroscopic and chemical methods are also introduced. Department enforced corequisite: CHEM 3311 or CHEM 3451.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3361

Requisites: Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-).

CHEM 3331 (4) Organic Chemistry 2

Lect. and rec. Intended primarily for nonmajors. Topics include structure and reactions of alkyl halides, alcohols, ethers, carboxylic acids, aldehydes, ketones, and amines; introduction to the chemistry of heterocycles, carbohydrates, and amino acids; nomenclature of organic compounds; synthesis; and reaction mechanisms. Department enforced corequisite: CHEM 3341 or CHEM 3381.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3471 (formerly CHEM 3371) or CHEM 3491

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3351 and CHEM 3321 or CHEM 3361 (all minimum grade C-).

CHEM 3341 (1) Laboratory in Organic Chemistry 2

Lab. For biochemistry and nonchemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing reactions involving alcohols, ketones, carboxylic acids, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-).

CHEM 3361 (2) Laboratory in Organic Chemistry 1 for Chemistry Majors

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern organic chemistry emphasizing chemical separations and reactions of alkanes, alkenes, alcohols, ketones, and alkyl halides. Explores stereochemical modeling and the chemical identification of organic unknowns. Department enforced corequisite: CHEM 3351 or CHEM 3311 or CHEM 3451.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3321

Requisites: Requires prerequisite course of CHEM 1133 and CHEM 1134 or CHEM 2100 or CHEM 1400 and CHEM 1401 or CHEN 1211 and CHEM 1221 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 3381 (2) Laboratory in Organic Chemistry 2 for Chemistry Majors

Lab. Required course for chemistry majors. Instruction in experimental techniques of modern chemistry, emphasizing reactions involving alcohols, ketones, carboxylic acids, aromatic compounds, and their derivatives. Multistep syntheses are also introduced. Department enforced corequisite: CHEM 3331 or CHEM 3471 or CHEM 3491.

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 3451 (4) Organic Chemistry for Chemistry and Biochemistry Majors

Covers bonding, acidity, reaction mechanisms, nomenclature of organic compounds; stereochemistry; structure and reactions of aldehydes, ketones, and carboxylic acids and derivatives. Department enforced corequisite: CHEM 3361 or CHEM 3321.

Requisites: Requires prerequisite courses of CHEM 1400 and CHEM 1401 (minimum grade C-) or CHEM 1133 and CHEM 1134 (minimum grade B+). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 3471 (4) Organic Chemistry 2 for Chemistry Majors

Covers Amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity, and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanisms. Department enforced corequisite: CHEM 3381 or CHEM 3341. Formerly CHEM 3371.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3331 and CHEM 3491

Requisites: Requires prerequisite courses of CHEM 3451 and CHEM 3361 or CHEM 3321 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 3491 (4) Organic Chemistry 2 for Biochemistry Majors

Covers amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanism. Department enforced corequisite: CHEM 3341 or CHEM 3381.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3471 (formerly CHEM 3371) and CHEM 3331

Requisites: Requires prerequisite courses of CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 4011 (3) Modern Inorganic Chemistry

Lect. Required course for chemistry majors. Introduces modern inorganic chemistry for undergraduates. Includes atomic structure, chemical periodicity, structure and bonding in molecules and crystals, reaction mechanisms, chemistry of selected main group and transition elements, and emphasis on catalyst, materials, bioinorganic, and organometallic systems.

Requisites: Requires a prerequisite course of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4021 (3) Inorganic Laboratory

One lect. and two 3-hour labs per week. Instruction in experimental techniques of modern inorganic chemistry. Includes syntheses and spectroscopic characterizations of transition metal and main group compounds, experience in manipulation of air sensitive compounds, and techniques involving unusual conditions of pressure or temperature.

Requisites: Requires prerequisite course of CHEM 4011 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4131 (3) Chemistry of Global Health

Understanding the chemistry associated with health care in resource-poor countries is the objective of this course. Focuses on preventing, diagnosing and treating the world's deadliest infectious diseases with a particular emphasis on Africa and Central America.

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and EBIO 1210 or MCDB 1150 (all minimum grade C-).

CHEM 4141 (3) Environmental Water and Soil Chemistry

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5141

Requisites: Requires prerequisite course of CHEM 2100 or CHEM 1133 and CHEM 1134 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

CHEM 4171 (3) Instrumental Analysis - Lecture and Laboratory 1

Two Lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis to address problems in chemistry, biochemistry, industrial chemistry and environmental chemistry.

Requisites: Requires prerequisite course of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and CHEM 3341 or CHEM 3381 and PHYS 1140 or CHEM 4400 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 4181 (3) Instrumental Analysis - Lecture and Laboratory 2

Two lect. and 3 hours of lab per week. Instruction and experience in using instrumental methods of chemical analysis. Builds on material learned in CHEM 4171.

Requisites: Requires prerequisite course of CHEM 4171 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Grading Basis: Letter Grade

CHEM 4251 (3) Materials Chemistry and Properties

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5251

Requisites: Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4521 or CHEM 4531 (all minimum grade C-).

CHEM 4261 (3) Organic Materials: Structures and Functions

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5261

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

CHEM 4271 (3) Chemistry of Solar Energy

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5271

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 or CHEM 3491 and CHEM 4531 (all minimum grade C-).

CHEM 4400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Department enforced prerequisite or corequisite: PHYS 1120 or PHYS 2020. Formerly CHEM 4411.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5400 and CHEM 4511

Requisites: Requires prerequisite courses CHEM 3331 or CHEM 3471 or CHEM 3491 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 (all minimum grade C-).

CHEM 4491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies. Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5491

Requisites: Requires prerequisite courses of CHEM 3311 or CHEM 3451 and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 and CHEM 4400 (formerly CHEM 4411) or CHEM 4511 or corequisite of CHEM 4400 or CHEM 4511 (all minimum grade C).

Grading Basis: Letter Grade

CHEM 4511 (3) Physical Chemistry 1

Lect. Chemical thermodynamics and kinetics. Includes study of laws of thermodynamics, thermochemistry, entropy, free energy, chemical potential, chemical equilibria, and the rates and mechanisms of chemical reactions. Department enforced prereq or coreq., PHYS 1120 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4400 and CHEM 5400

Requisites: Requires prerequisite of courses CHEM 3311 or CHEM 3451 and MATH 2400 or APPM 2350 and PHYS 1110 or PHYS 2020 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4531 (3) Physical Chemistry 2

Lect. Introduces the quantum theory of atoms, molecules and chemical bonding, and statistical thermodynamics. Includes principles of quantum mechanics and their application to atomic structure, molecular spectroscopy, symmetry properties, and the determination of molecular structure. Also includes principles of statistical mechanics and their applications to properties of gases, liquids, and solids.

Requisites: Requires prerequisite courses of CHEM 4511 and PHYS 1120 or PHYS 2020, and MATH 2400 or APPM 2350 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4555 (4) Theoretical and Computational Chemistry

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations. Not recommended for students with a grade below B- in the prerequisite course.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5555

Requisites: Requires prerequisite course of CHEM 4531 (minimum grade C-).

Grading Basis: Letter Grade

CHEM 4581 (1) Physical Chemistry Lab 1

One 3-hour lab per week. Instruction in experimental techniques of modern physical chemistry. Experiments illustrate the fundamental principles of thermodynamics and chemical kinetics. Illustrates the material discussed in CHEM 4511.

Requisites: Requires prerequisite or corequisite course of CHEM 4511 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4591 (2) Physical Chemistry Lab 2

One lect. and one 3-hour laboratory every two weeks. a continuation of CHEM 4581, but may be taken concurrently with CHEM 4531. Experiments illustrate the principles of quantum chemistry and spectroscopy discussed in CHEM 4531.

Requisites: Requires prerequisite courses of CHEM 4511 and CHEM 4581 (all minimum grade C-). Requires prerequisite or corequisite course of CHEM 4531 (minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4611 (3) Survey of Biochemistry

Lec. One-semester survey of the main themes of modern biochemistry: biomolecular structure/function, metabolism, biosynthesis, DNA from genome to proteome and cellular signaling. For biology and engineering majors and others wanting a survey of biochemistry.

Requisites: Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-).

CHEM 4621 (3) Genome Databases: Mining and Management

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure. Department enforced corequisite: CSCI 2270.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4621 or MCDB 5621 CHEM 5621

Requisites: Requires prerequisite course of CHEM 4700 or CSCI 3104 or MCDB 3500 (minimum grade C-).

CHEM 4700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of organic and physical chemistry will be required. Formerly CHEM 4711.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5700

Requisites: Requires prerequisite course of CHEM 3331 or CHEM 3471 or CHEM 3491 (minimum grade C-).

Grading Basis: Letter Grade

CHEM 4720 (4) Metabolic Pathways and Human Disease

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5720

Requisites: Requires a prerequisite course of CHEM 4700 (formerly CHEM 4711; minimum grade C-).

CHEM 4740 (4) Biochemistry of Gene Transmission, Expression and Regulation

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5740

Requisites: Requires a prerequisite course of CHEM 4700 (formerly CHEM 4711; minimum grade C-).

CHEM 4751 (3) Current Topics in Biochemical Research

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5751

Requisites: Requires prerequisite courses of CHEM 4700 and CHEM 4740 or MCDB 3135 (all minimum grade C-).

CHEM 4761 (4) Biochemistry Laboratory

Two 5-hour periods per week. The first hour of each period is lecture, the remainder is laboratory. Introduction to modern biochemical techniques. Topics include enzymology, spectrophotometry, electrophoresis affinity chromatography, radioisotopes, recombinant DNA, and molecular cloning.

Requisites: Requires a prerequisite course of CHEM 4700 (formerly CHEM 4711; minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

CHEM 4791 (3) Bioorganic Chemistry in Biotechnology

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5791

Requisites: Requires prerequisite courses of CHEM 3331 or CHEM 3471 (formerly CHEM 3371) or CHEM 3491 and CHEM 4700 (minimum grade C-).

Recommended: Prerequisite undergraduate molecular biology.

CHEM 4901 (1-6) Independent Study in Chemistry and Biochemistry

For undergraduate study. Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

CHEM 5011 (3) Advanced Inorganic Chemistry 1

Lect. Inorganic chemistry based on principles of bonding, structure, reaction mechanisms, and modern synthetic methods. Chemistry and general properties of representative and transition elements and their compounds.

Requisites: Requires prerequisite courses of CHEM 4011 and CHEM 4531 (all minimum grade B-) or graduate standing.

CHEM 5061 (3) Advanced Inorganic Chemistry 2

Lectures in physical inorganic chemistry with an emphasis on topics for understanding modern solar energy conversion to electricity and fuels. Includes a description of bonding and properties of coordination compounds in terms of the ligand field and molecular orbital theories. The primary research literature will be used to motivate exploration of relevant themes including spectroscopy, electron transfer, energy transfer, bioenergetic conversion, and small-molecule activation.

Requisites: Requires prerequisite course of CHEM 4011 (minimum grade C-) or graduate standing.

CHEM 5141 (3) Environmental Water and Soil Chemistry

Application of basic chemical principles to understanding the processes that determine the chemical composition of oceans, lakes, rivers, soils and sediments. Topics include air-water exchange; acid-base, redox, coordination, precipitation and dissolution, ion exchange and sorption reactions; nutrient chemistry; and the use of simple equilibrium and kinetic models for describing the chemistry of inorganic and organic species in air-water-soil systems.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4141

Requisites: Restricted to graduate students only.

CHEM 5151 (3) Atmospheric Chemistry

Lect. Basic kinetics and photochemistry of atmospheric species. Stratospheric chemistry with emphasis on processes controlling ozone abundance. Tropospheric chemistry focusing on photochemical smog, acid deposition, oxidative capacity of the atmosphere and global climate change.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5151

Requisites: Restricted to graduate students only.

Recommended: Prerequisite one semester of college-level chemistry.

CHEM 5152 (3) Advanced Atmospheric Chemistry

Follows Graduate Atmospheric Chemistry (CHEM 5151) and explores advanced topics in atmospheric chemistry, such as secondary aerosol formation, oxidant formation, the chemistry of global climate change and/or design of advanced laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5152

Recommended: Prerequisite CHEM 5151 or ATOC 5151.

CHEM 5161 (3) Analytical Atmospheric Spectroscopy

Optical spectrochemical analysis, atmospheric transmittance, including atomic and molecular spectroscopy, line-by-line spectral databases such as HITRAN, absorption, emission, fluorescence, scattering processes of gases, surface enhancements, aerosols, optical spectroscopic instrument components, and techniques, and their applications to atmospheric, and environmental problems. Department enforced prereq., undergraduate physical chemistry or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5171 (3) Electroanalytical Chemistry

Lect. Establishes a background for understanding electrochemical systems through a review of the relevant thermodynamic, kinetic and electronic principles. Compares classical and modern electrochemical methods of analysis. Several special topics are discussed in depth. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5181 (3) Mass Spectrometry and Chromatography

Mass spectrometry, including instrumentation, ionization techniques and interpretation of mass spectra. Theory and practice of analytical separation processes including ion mobility, capillary electrophoresis and liquid gas chromatography. Introduction to applications in e.g. atmospheric and biological mass spectrometry. Introduction to computer simulation of instrumentation and physical processes. Department enforced prerequisite: undergraduate physical chemistry or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5201 (3) Atmospheric Aerosol Discussions

Discusses recent literature concerning atmospheric aerosols and their role in atmospheric problems, including global ozone depletion, air quality, regional haze, acid rain, and global climate change.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CHEM 5151 or ATOC 5151.

CHEM 5251 (3) Materials Chemistry and Properties

Lec. Understanding of materials from chemistry perspective including metals, oxides, semiconductors and polymers. Basic description of chemical preparation of materials. Overview of fundamental properties of materials including structural, chemical, mechanical, thermal, electrical, and optical properties. Description of behavior of materials and various applications in modern technology. Discussion of materials characterization methods.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4251

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

CHEM 5261 (3) Organic Materials: Structures and Functions

Overview of the preparation and functioning mechanism of novel organic materials that have recently been developed, including conductive polymers, 2-D macrocyclic structures, 3-D molecular cages, molecular machines/muscles/switches, fullerene derivatives and carbon nanotube composites. Emphasizes the use of organic and physical chemistry as tools to develop novel materials and probe their structure-property relationship.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4261

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

CHEM 5271 (3) Chemistry of Solar Energy

Chemical principles of conversion of solar energy into electricity and fuels in molecular and semiconductor-based systems. Overview of solid-state electronic structure of materials and interfaces, light-matter interactions, principles of harvesting photoexcited currents and useful chemical species. Description of processes utilized in established and emerging solar energy technologies.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4271

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4531 (all minimum grade C-) or graduate standing.

CHEM 5281 (3) Semiconductor Processing and Device Fabrication

Understanding of semiconductor processing and device fabrication from chemistry perspective. Overview of processing steps used to fabricate inorganic semiconductor devices including deposition, patterning and etching techniques. Description of process integration during device fabrication. Discussion of key issues facing advanced semiconductor fabrication.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CHEM 5311 (3) Advanced Synthetic Organic Chemistry

Lect. Surveys synthetic transformations emphasizing important functional group transformations and carbon-carbon, bond-forming reactions. Required of all organic chemistry graduate students.

Department enforced prerequisite: one year of organic chemistry or graduate standing.

CHEM 5321 (3) Advanced Physical Organic Chemistry

Lect. Modern concepts of physical organic chemistry and their use in interpreting data in terms of mechanisms of organic reactions and reactivities of organic compounds. Required of all organic chemistry graduate students. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

CHEM 5331 (3) Advanced Spectroscopic Techniques in Organic Chemistry

Lect. Advanced spectroscopic techniques for structure and determination in organic chemistry. Emphasizes proton and carbon-13 NMR spectroscopy. Department enforced prerequisites: one year of organic chemistry and one year of physical chemistry or graduate standing.

CHEM 5341 (3) Chemical Biology and Drug Design

Develop knowledge base and skills in the interdisciplinary field of chemical biology, including aspects of chemistry and biology, and integrating both with respect to hierarchical levels of structure (atomic, molecular, cellular). Students will receive training that helps to develop their careers in biotech, pharmaceutical and other research-oriented industries as well as in academia. Department enforced prerequisites: introductory organic chemistry and general biochemistry.

Requisites: Restricted to graduate students only.

CHEM 5400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Formerly CHEM 5411.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4400 and CHEM 4511

Requisites: Restricted to graduate students only.

CHEM 5491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies.

Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4491

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CHEM 5501 (3) Advanced Topics in Physical Chemistry

Covers various topics in physical chemistry focusing on their mathematical and physical background. Topics include the application of classical mechanics and electrodynamics in chemistry, the classical mechanics background for the description of atoms and molecules, the use of vector spaces in wave mechanics and quantum mechanics and the classical description of spectroscopy in terms of interaction of light and matter. Department enforced prerequisites: undergraduate physical chemistry, graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5531 (3) Statistical Mechanics

Lect. Fundamental concepts of quantum and classical statistical mechanics. Applications to properties of gases, liquids, solids, spin and polymer systems. Reaction, fluctuation, nucleation and relaxation phenomena. Department enforced prerequisite: undergraduate physical chemistry.

Requisites: Restricted to graduate students only.

CHEM 5541 (3) Chemical Dynamics

Lect. Discussion of mechanism and rate of chemical reactions from a fundamental point of view. Discusses nature of collision and develops concepts of cross section and rate constant. Theories of elementary bimolecular and decay processes are critically examined. Department enforced prerequisite: undergraduate physical chemistry.

Requisites: Restricted to graduate students only.

CHEM 5555 (4) Theoretical and Computational Chemistry

Explores computational methods to understand chemical systems. Topics include: atomic and molecular electronic structure calculations, Monte Carlo and molecular dynamics simulations and thermodynamic calculations.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4555

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CHEM 5571 (3) Surface Science

Lect. Principles of surface science with emphasis on fundamental surface phenomena, surface techniques and surface chemistry. Basic description of surfaces, adsorbate-surface interactions, surface kinetics and methods of surface analysis. Surface science of heterogeneous catalysis, semiconductor processing, and environmental interfaces. Department enforced prerequisites: undergraduate physical chemistry and graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5581 (3) Introductory Quantum Chemistry

Lect. Basic principles and techniques of quantum mechanics with applications to questions of chemical interest. Quantum dynamics of atoms, molecules and spin; electronic structure of atoms and molecules. Department enforced prerequisite: two semesters of physical chemistry and graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5591 (3) Advanced Molecular Spectroscopy

Lect. Rotational, vibrational and electronic spectra of molecules, and their interpretation in terms of the quantum theory of molecular structure.

Department enforced prerequisites: two semesters of physical chemistry and graduate standing or instructor consent.

Requisites: Restricted to graduate students only.

CHEM 5621 (3) Genome Databases: Mining and Management

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4621 or MCDB 5621 CHEM 4621

Requisites: Restricted to graduate students only.

CHEM 5700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of organic and physical chemistry will be required. Formerly CHEM 5711.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4700

Requisites: Restricted to graduate students only.

CHEM 5720 (4) Metabolic Pathways and Human Disease

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4720

Requisites: Restricted to graduate students only.

CHEM 5740 (4) Biochemistry of Gene Transmission, Expression and Regulation

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4740

Requisites: Restricted to graduate students only.

CHEM 5751 (3) Current Topics in Biochemical Research

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4751

Requisites: Restricted to graduate students only.

CHEM 5770 (3) Fundamentals of Biochemistry I

Analysis of topics in biochemistry including DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, and protein structure and dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5771 covering the same topics except for the requirement of a written research proposal.

CHEM 5771 (5) Advanced General Biochemistry 1

Lect. In-depth analysis of DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, protein structure, protein dynamics, and physical chemistry of macromolecules. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students.

CHEM 5776 (1) Scientific Ethics and Responsible Conduct in Research

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5776

Requisites: Requires prerequisite course of CHEM 5771 or CHEM 5271 (minimum grade B-). Restricted to graduate students only.

CHEM 5780 (3) Fundamentals of Biochemistry II

Analysis of topics in biochemistry including protein structure, methods of structure determination and prediction, protein folding, and protein dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5781, covering the same topics except for the requirement of a written research proposal.

Requisites: Requires prerequisite course of CHEM 5770 (minimum grade B-). Restricted to graduate students only.

CHEM 5781 (5) Advanced General Biochemistry 2

Lect. Detailed consideration of contemporary topics in biochemistry, including protein structure (primary, secondary, tertiary, and quaternary), methods of structure determination and prediction, protein folding (kinetics, thermodynamics, denaturation, and renaturation), and protein dynamics (internal motions and methods of analysis).

Requisites: Requires prerequisite course of CHEM 5771 (minimum grade B-). Restricted to graduate students only.

CHEM 5791 (3) Bioorganic Chemistry in Biotechnology

Lec. Explores examples of antibodies, peptides, proteins, RNA, DNA, carbohydrates and lipids. Uses the primary literature and requires student participation.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4791

Requisites: Restricted to graduate students only.

CHEM 5801 (3) Advanced Signal Transduction and Cell Cycle Regulation

Lect. Advanced discussion of current research and literature in signal transduction, including ligands, receptors, and intracellular signaling pathways, as well as control on transcription, chromatin structure, DNA replication, mitosis, and cell cycle progression.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210 or MCDB 5220.

CHEM 5811 (3) Advanced Methods in Protein Sequencing and Analysis

Lect. Advanced discussion of current methods in protein sequencing, sequence analysis, and posttranslational modifications, emphasizing techniques of mass spectrometry, use of protein databases, sequence alignment and motifs, structure prediction, and modeling of signaling pathways. Department consent required.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210.

CHEM 5821 (1) Special Topics in Signaling and Cell Regulation

Lect. Reviews and evaluates literature on subjects of current interest in signal transduction transcription, cell cycle progression, and cell regulation. Primarily for graduate level presentation of special topics by students, faculty, and research staff. Department consent required.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6001 (1) Seminar: Inorganic Chemistry

Student, faculty, and guest presentations and discussions of current research in inorganic chemistry and related topics (transition element and main group element compound properties, inorganic compound in biological, industrial, and materials applications). Required of all inorganic chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

Requisites: Restricted to graduate students only.

CHEM 6021 (1-3) Special Topics in Inorganic Chemistry

Lect. Subjects of current interest in inorganic chemistry. Primarily used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6031 (3) Special Topics in Nanoscience

Introduces the synthesis, physical properties, and applications of nanometer-scale materials and devices. Includes synthesis of metal and semiconductor nanoparticles and nanowires, optical and electronic properties of nanoscale systems, and applications in biotechnology and energy.

Requisites: Requires prerequisite course of CHEM 4431 or CHEM 4511 (all minimum grade B-) or graduate standing.

CHEM 6101 (1) Seminar: Analytical Chemistry

Student, faculty, and guest presentations and discussions of current research in analytical chemistry. Required of all analytical chemistry graduate students. Credit deferred until presentation of satisfactory seminar.

Requisites: Restricted to graduate students only.

CHEM 6111 (1-3) Special Topics in Analytical Chemistry

Lect. Subjects of current interest in analytical chemistry. Used for graduate-level presentations of special topics by visiting and resident faculty. Variable class schedule.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6301 (1-3) Seminar in Organic Chemistry

Discussions principally concerned with recent literature in organic chemistry. Required of all organic chemistry graduate students.

Requisites: Restricted to graduate students only.

CHEM 6311 (1-3) Special Topics in Synthetic Organic Chemistry

Lect. Selected topics in synthetic organic chemistry, encompassing both methods and/or total synthesis of complex molecules.

Requisites: Requires prerequisite course of CHEM 5311 (minimum grade B-). Restricted to graduate students only.

CHEM 6321 (1-3) Special Topics in Physical Organic Chemistry

Lect. Selected topics in physical organic chemistry, which may include photochemistry, carbene chemistry, free radical chemistry, molecular orbital methods, organic materials, or gas phase ion chemistry.

Requisites: Requires prerequisite course of CHEM 5321 (minimum grade B-). Restricted to graduate students only.

CHEM 6401 (1-3) Seminar: Physical Chemistry

Student, faculty, and guest presentations of current research in physical chemistry. Discussion of research topics related to the subject of weekly physical chemistry/chemical physics seminar and appropriate journal articles.

Requisites: Restricted to graduate students only.

CHEM 6411 (1-3) Advanced Topics in Physical Chemistry

Lect.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6601 (1) Biochemistry Seminar

Required of all biochemistry graduate students. Credit is deferred until presentation of satisfactory seminar.

Requisites: Restricted to graduate students only.

CHEM 6621 (1) Special Topics in RNA

Reviews and evaluates recent scientific literature in the field of RNA chemistry and biology, including topics in structure, catalysis, bioinformatic approaches and control of gene expression. Primarily for graduate level presentation of special topics by students and research staff.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 6621

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6711 (3-6) Advanced Topics in Biochemistry

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6731 (3-6) Advanced Topics in Biochemistry

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6801 (0) Departmental Research Seminar

Lectures by visiting scientists and occasionally by staff members and graduate students on topics of current research. Meets once a week.

Required for all graduate students in chemistry.

Requisites: Restricted to graduate students only.

CHEM 6901 (1-6) Research in Chemistry

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 6941 (1) Master's Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

CHEM 6951 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

CHEM 7021 (2) Seminar: Structural Inorganic Chemistry

Current research in the area of structural inorganic chemistry. Concerns topics related to electronic and molecular structure of transition metal complexes. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7101 (2) Seminar: Chromatography and Trace Analysis

Student and faculty discussions and reports on research advances in chromatography, trace analysis and environmental chemistry. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7111 (2) Seminar: Electrochemistry

Student and faculty discussions and reports on research advances in electrochemistry. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7131 (1) Seminar in Atmospheric Aerosol Chemistry

Discusses advances in atmospheric aerosol chemistry, with emphasis on new methods for analysis and their application to laboratory and field studies.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5151 and CHEM 5181.

CHEM 7161 (1) Seminar: Heterogeneous Atmospheric Chemistry

Topics in atmospheric chemistry emphasizing the structure and reactivity of atmospheric particulates. Presentations on current research and critical evaluations of recent literature. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7211 (1) Seminar: Topics in Synthetic Methodology and Natural Product Synthesis

Discussion of contemporary synthetic organic chemistry with a focus on new methodology and total synthesis of natural products.

Requisites: Restricted to graduate students only.

CHEM 7221 (1) Seminar: Photochemistry and Free Radical Chemistry

Current research in areas of organic free radical chemistry, photochemistry, and related topics are presented and discussed. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7231 (1) Seminar: Reactive Intermediates

Application of contemporary ideas of chemical physics to organic molecules. Special attention to structures and bonding in organic ions and radicals. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7241 (1) Seminar: Synthetic Organic Chemistry

Series of seminars on directed total synthesis. Emphasizes modern synthetic methodology and applications to total synthesis of natural products. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7251 (1) Selected Topics in Chemical Genetics

Discusses the brief history of the emerging field of chemical genetics, and focuses on the recent development of concepts, techniques, applications, and its impact on both science and human health.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7271 (1) Seminar: Picosecond Dynamics of Reactions

Includes development and application of picosecond laser spectroscopy to organic and organometallic reactions. Emphasizes relationship between current theoretical developments and experiments. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7281 (1) Seminar: Molecular Self-Assembly

Discusses current topics and recent advances in molecular self-assembly, with emphasis on new liquid crystal designs and applications.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7291 (1) Seminar: Physical Organic Chemistry

Modern experimental techniques and theoretical models in physical organic chemistry are discussed in relation to the development of new materials, such as molecular size tinkertoys to the development of novel photochemical systems and their spectroscopies. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7301 (1) Seminar: Synthetic and Mechanistic Chemistry

Discusses particularly the synthesis of complex organic molecules and the mechanism of reagents used in organic synthesis. Includes a study of transition metal mediated organic reactions. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7311 (1) Selected Topics in Organic Materials

Current research in the area of organic/materials chemistry. Concerns topics related to organic materials synthesis, carbon nanotube functionalization, artificial photosynthesis, gas storage and catalysis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7401 (1) Seminar in Photochemical Reaction Control

Discusses progress towards control of molecular reactivity using light, including synthetic methods for creating control subjects. Emphasizes new methods to achieve coherent control.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7421 (2) Seminar: Negative Ion Chemistry

Chemistry of negative ions; experimental methods and designs; laser spectroscopy of ions; theoretical methods; reactive dynamics of ions in the gas phase. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7431 (1) Seminar: Topics in Theoretical Chemical Physics

Seminars presented on a variety of topics in theoretical chemical physics. Molecular collisions and unimolecular dynamics predominantly featured. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7441 (2) Research Seminar: Theoretical Chemistry

Studies theoretical description of molecular dynamics as related to rate processes. Focuses on chemical reactions in liquids, absorption-desorption on surfaces, nucleation reactions, and energy flow in molecules. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7461 (1) Seminar: Gas Phase Ion Chemistry

Studies gas phase ion chemistry relevant to thermochemical measurements and atmospheric, interstellar, and biomedical applications.

Requisites: Restricted to graduate students only.

CHEM 7471 (1) Seminar in Ultrafast Spectroscopy of Proteins

Discusses advances and developments in biomolecular dynamics, and considers the connection of protein dynamics with function. Emphasizes experimental studies via ultrafast laser spectroscopy.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7481 (2) Seminar: Molecular Spectroscopy and Photochemistry

Discussion and presentation of current research in spectroscopy and photochemistry of organic as well as organometallic systems. Reviews state of the art techniques available for the theoretical and experimental characterization of excited states. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7491 (1) Seminar: Molecular Vibrational Dynamics

Topics pertaining to vibrational dynamics of small molecules are discussed, with particular emphasis upon IR laser spectroscopy, van der Waals' clusters, vibrationally induced dipole moments, and predissociation. Discussion of current research and recently published literature. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7501 (1) Seminar: Theoretical Molecular Dynamics

Variety of topics in theoretical chemical physics, emphasizing dynamics of molecules in dissipative environments or in radiation fields. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7511 (1) Seminar: Reaction Dynamics in Condensed Phases

Studies elementary steps in chemical reactions and their observation by ultrafast spectroscopy. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7521 (1) Seminar: Atmospheric Kinetics and Photochemistry

Discusses laboratory studies of degradation mechanisms. Applies these studies to atmospheric phenomena such as global warming and stratospheric ozone loss. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7531 (1) Seminar: Surface Chemistry and Thin Film Growth

Topics in surface chemistry and thin film growth with focus on atomic layer deposition (ALD) and molecular layer deposition (MLD). Properties of thin films grown using ALD and MLD. Applications of thin films in areas including flexible displays, energy storage and catalysis. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7551 (1) Selected Topics in Ion Spectroscopy

Treats current topics in the spectroscopy of ions. Seminar lectures are given by graduate students on their research and on literature topics, and the results of both in-house and external research groups are studied. Additionally, ideas for interesting directions of research and new experiments are proposed and discussed.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7601 (2) Seminar: Nucleic Acid Chemistry

Topics in various aspects of current research; emphasizes student readings and presentations. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7611 (1) Seminar: Structures and Dynamics of Biopolymers in Solution

Discussion of experimental and theoretical approaches for probing structures and dynamics of proteins, peptides, and nucleic acids; and computations in molecular dynamics simulation, modeling, and geometry. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7621 (1) Seminar: Biochemistry and Molecular Biology of Signal Transduction

Discusses and reviews the current literature and experimental results in signal transduction, cell cycle and tumor suppressor gene regulation. Emphasizes the understandings of molecular and biochemical mechanisms of the origin of human tumor cells.

Requisites: Restricted to graduate students only.

CHEM 7651 (2) Seminar: Environmental Biochemistry

Topics in various aspects of current biochemical and environmental research. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

CHEM 7661 (1) Structure/Function of Human Mediator Transcription Complexes

Study of the mechanisms of eukaryotic gene expression with an emphasis on the structure and function of human mediator transcription complexes.

Requisites: Restricted to graduate students only.

CHEM 7671 (1) Seminar: Topics in Designing Probes for Signaling Reactions

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered.
Requisites: Restricted to graduate students only.

CHEM 7691 (1) Seminar: Protein Dynamics and the Mechanism of Sensory Proteins

Discusses recent results and current literature in the areas of the mechanism of sensory proteins, internal motions of proteins, and protein folding. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to graduate students only.

CHEM 7701 (1) Seminar: Enzyme Mechanisms and Kinetics

Studies experimental approaches to understand the mechanisms of enzymic catalysis. Techniques include steady-state and pre-steady-state kinetics, isotope trapping and partitioning, inhibition by substrate analogues, and covalent modification of proteins. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to graduate students only.

CHEM 7711 (1) RNA Mediated Inorganic and Organic Reactions

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered.
Requisites: Restricted to graduate students only.

CHEM 7741 (1) Seminar: Signal Transduction and Protein Phosphorylation

Devoted to experimental methods for understanding mechanisms of signal transduction in mammalian cells through pathways involving regulation of protein phosphorylation. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to graduate students only.

CHEM 7751 (1) Seminar: Protein Structure and Folding

Studies structure and folding of proteins and protein complexes using biophysical methods, including nuclear magnetic resonance (NMR), circular dichroism, and fluorescence spectroscopies. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to graduate students only.

CHEM 7761 (1) Seminar: Eukaryotic Transcriptional Regulation

Studies the regulation of transcription by RNA Polymerase II from human promoters. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.
Requisites: Restricted to graduate students only.

CHEM 7781 (1) Seminar: Topics in Structural Biology

Discussion of advances and developments in structural biology with emphasis on new methods for protein expression, purification and crystallization; and structure solution implementation.

Requisites: Restricted to graduate students only.

CHEM 7791 (1) Seminar: Topics in Ribonucleoprotein Assemblies

Studies aspects of the biochemical and structural analysis of ribonucleic acid (RNA) and its interactions with proteins and assemblies into functional ribonucleoprotein (RNP) enzymes. Techniques focus on x-ray crystallography, spectroscopic methods, and biochemical probing.

Requisites: Restricted to graduate students only.

CHEM 8991 (1-10) Doctoral Dissertation

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.
Requisites: Restricted to graduate students only.

Chinese (CHIN)

Courses

CHIN 1010 (5) Beginning Chinese 1

Introduces modern Chinese (Mandarin), developing all four skills (speaking, listening, reading and writing) and communicative strategies. Students learn both traditional full-form characters and the principles for converting them into simplified characters.

Additional Information: Arts Sci Core Curr: Foreign Language
 Departmental Category: Chinese
 Departmental Category: Asia Content

CHIN 1012 (4) Introduction to Chinese Civilization

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of China. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
 Departmental Category: Chinese Courses in English
 Departmental Category: Asia Content

CHIN 1020 (5) Beginning Chinese 2

Continuation of CHIN 1010.

Requisites: Requires prerequisite course of CHIN 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
 Departmental Category: Chinese
 Departmental Category: Asia Content

CHIN 1051 (3) Masterpieces of Chinese Literature in Translation

Surveys Chinese thought and culture through close reading and discussion of selected masterworks of Chinese literature in translation. Texts include significant works of poetry, fiction, and drama, as well as philosophical and historical writings from various eras. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
 Departmental Category: Chinese Courses in English
 Departmental Category: Asia Content

CHIN 2110 (5) Intermediate Chinese 1

Emphasizes reading, speaking, and writing modern Chinese, including continued study of both full-form and simplified characters. Introduces dictionaries and principles of character formation.

Requisites: Requires prerequisite course of CHIN 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
 Departmental Category: Chinese
 Departmental Category: Asia Content

CHIN 2120 (5) Intermediate Chinese 2

Continuation of CHIN 2110.

Requisites: Requires prerequisite course of CHIN 2110 (minimum grade C).

Additional Information: Departmental Category: Chinese
 Departmental Category: Asia Content

CHIN 2441 (3) Film and the Dynamics of Chinese Culture

Through studying a group of Chinese films in light of modern Chinese history and literature, students examine a series of cultural dilemmas and issues in 20th century China and develop skills in analyzing literary and filmic texts. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities Arts Sci Core Curr: Literature and the Arts

Departmental Category: Chinese Courses in English
Departmental Category: Asia Content

CHIN 3110 (5) Advanced Chinese 1

Surveys a variety of authentic-language materials, including films, plays, newspaper articles, essays, and short stories. Emphasizes proficiency-oriented approach to reading, writing, and oral communication.

Requisites: Requires prerequisite course of CHIN 2120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 3120 (5) Advanced Chinese 2

Continuation of CHIN 3110.

Requisites: Requires prerequisite course of CHIN 3110 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for Chinese majors and minors. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 3200

Requisites: Restricted to students with a minimum of 45 units.

Additional Information: Arts Sci Core Curr: Written Communication

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

CHIN 3311 (3) The Dao and the World in Medieval China

An interdisciplinary examination of role of Daoist and Buddhist philosophical and religious concepts and images in medieval Chinese civilization, including literature and the arts. Focuses on the personal aspects of this period of religious and intellectual ferment, tracing the representation of these ideas in Chinese poetry, prose, painting and the plastic arts as well as their role in philosophical and religious speculation. Taught in English.

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3321 (3) Culture and Literature of Ancient China

Focuses on the religious, cultural, philosophical and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English and taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3321

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3331 (3) Culture and Literature of Late Imperial China

The late imperial period was marked by growth of great metropolitan areas, expanded urban entertainments, and an extensive popular culture.

Focuses on the literature and artifacts of this urban culture as well as the hegemonic culture of the state and of traditional social codes and their literary manifestations. Also considers growing contacts with the West and the transition to the modern period. All readings are in English. Taught in English.

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3334 (3) Chinese Narrative Tradition

Examines the major works of Chinese narrative tradition from the fourth to the nineteenth century. Emphasizes the reading and analysis of selected texts and understanding of the cultural and social contexts of text production and circulation. Text selections vary from year to year. Taught in English.

Recommended: Prerequisite CHIN 1012.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3341 (3) Literature and Popular Culture in Modern China

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3341

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3342 (3) Literary Culture in Contemporary China

Surveys the late 20th century Chinese and Taiwanese literature and popular culture against the historical background Market Reform in China and the lifting of Martial Law in Taiwan. Emphasizes close and critical reading skills and an understanding of how aesthetic texts critically engage within historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films, and scholarly articles. Taught in English.

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3351 (3) Reality and Dream in Traditional Chinese Literature

Explores the role of dreams in pre-modern Chinese literature from the beginnings in the 2nd millennium B.C.E. to the 19th century. The source texts will range from religious, philosophical, medical and historical writings to poetry to various genres of fictional prose and drama. Taught in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3361 (3) Women and the Supernatural in Chinese Literature

Explores the relationship between the worlds of women and the supernatural in Chinese literature, from ancient to modern times. Focuses on selected significant works of classical and vernacular fiction, religious texts, and poetry. Taught in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 3371 (3) Topics in Chinese Film

Offers in-depth, critical analysis of key issues in Chinese culture as represented in Chinese film. Focuses on various topics, such as specific directors, regions, representation of gender in Chinese film, historical periods, etc. Varies from year to year. Requires no knowledge of Chinese. Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CHIN 1051 or CHIN 2441.

Additional Information: Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

CHIN 4110 (3) Advanced Readings in Modern Chinese 1

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

Requisites: Requires prerequisite course of CHIN 3120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4120 (3) Advanced Readings in Modern Chinese 2

Surveys a wide variety of 20th- and 21st-century texts that are of recognized literary or cultural importance. Focuses on translation, including discussion of content and style.

Requisites: Requires prerequisite course of CHIN 3120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4210 (3) Introduction to Classical Chinese

Introduces the classical language based on texts from the pre-Han and Han periods. Stresses precise knowledge of grammatical principles and exactitude in translation—the basis for all further work in classical Chinese.

Requisites: Requires prerequisite course of CHIN 2120 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4220 (3) Readings in Classical Chinese

Close reading of selected texts of ancient and medieval literature. Readings in both prose and poetry. Emphasizes a disciplined, philological approach to the texts, with proper attention to diction, tone, and nuance.

Requisites: Requires prerequisite course of CHIN 4210 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4300 (3) Open Topics: Readings in Chinese Literature

Studies selected texts on a particular topic taught by regular or visiting faculty. Topics change each term.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4750 (3) Daoism

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 5750 and RLST 4750 and RLST 5750

Requisites: Requires prerequisite course of RLST 3800 (minimum grade C).

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4950 (3) Honors Thesis

Additional Information: Arts Sciences Honors Course

Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 4980 (1) Practical Issues in Chinese Language Pedagogy

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses. Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language. Department enforced prerequisite: CHIN 4120 (minimum grade C) or equivalent.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 5980

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 5010 (3) Sinological Methods

Provides training in research methods for graduate work in Sinology. Regular exercises require students to use standard bibliographic sources and tools, such as leishu, congshu, specialized dictionaries, dynastic histories, geographical treatises, gazetteers, and private historiography. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 5030 (3) Readings in Pre-Modern Chinese Literary Theory

Introduces the field of pre-modern Chinese literary theory and its relevance in Chinese intellectual history. Based on the close reading of primary sources, i.e. typically on selected core texts of Chinese literary thought, as well as on the reading of secondary literature. Texts and topics vary from year to year.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese

Departmental Category: Asia Content

CHIN 5120 (3) History of Literature through the Ninth Century

Surveys, with readings in primary and secondary sources, major landmarks in various areas of ancient and medieval literature. Focuses on the classic and most influential works of the Zhou through Tang dynasties. Gives attention to matters of historical fact and actuality as well as to textual and interpretive history.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5130 (3) History of Chinese Literature from the Tenth to the Nineteenth Century

Survey of Chinese literature from the tenth to the nineteenth century, with readings in primary and secondary sources. Focuses on the major literary works, genres, figures, and movements of the Song through the Qing dynasties.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5210 (3) Ancient Prose

Studies selected pre-imperial and Han prose texts important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on works such as the Lun yu, Mengzi, Zhuangzi, Huainanzi, Shiji, Hanshu, and Lunheng. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5220 (3) Ancient Poetry

Studies selected pre-imperial and Han poetic works important in their own time and for the influence they exercised on the later development of Chinese literary history. Focuses on the Shijing and the Chu ci, as well as the fu and shi of Han writers. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5230 (3) History of Early Chinese Thought

Introduces early Chinese philosophy, mostly "Masters' Literature" of the 5th–1st c. BCE, which is foundational for all later Chinese philosophy and political thought. Close reading of primary sources will be combined with an introduction to secondary scholarship in English and modern Chinese, both articles on individual texts/philosophers and comprehensive histories of early Chinese philosophy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5280 (3) Topics in Ancient Literature

Examines a specific problem or issue in ancient Chinese literature, e.g., early views of language's relationship to reality, or the commentary tradition and the emergence of allegorical and metaphysical approaches to interpreting texts. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5410 (3) Medieval Prose

Studies works of early medieval (ca. 200-600 AD) and/or late medieval (600-900) prose that played important role in development of Chinese literature. Writers and topics vary, ranging from surveys of specific genre, literary essays, proto-fiction, or historical writings, to focused studies of major figures Liu Zhiji, Han Yu, or Liu Zongyuan. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5420 (3) Medieval Poetry

Studies works of early medieval (ca. 200-600 AD) poetry. Writers and topics vary ranging from surveys of specific genre, shi or fu, or shared subject such as religious or commemorative verse, or specific periods, to focused studies of particular major figures Cao Zhi, Tao Qian, Li Bo, or Du Fu. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5430 (3) Medieval Thought and Religion

Studies selected works of early medieval (ca. 200-600 AD) and/or late medieval (600-900) religious importance. Selections vary from fundamental texts of both literary and religious value, Daoist and Buddhist canons, the Huangting jing, Zhen gao, Miaofa lianhua jing, and Tan jing, particular topics of social or cultural importance, character assessment, arcane learning, or methods of commentary. Knowledge of Classical Chinese at the level of CHIN 4220 is required..

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5480 (3) Topics in Medieval Literature

Examines a specific problem or issue in medieval literature, e.g., the role of encyclopedias and anthologies in literary training, or the place and forms of literary composition at the imperial court. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5610 (3) Early Modern Prose

Studies Song, Ming, and Qing prose texts selected for their inherent literary merit and for their significance in the Chinese literary tradition. Typically focuses on works by major authors such as Ouyang Xiu, Su Shi, and Yuan Hongdao. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5620 (3) Early Modern Poetry

Studies Song, Yuan, Ming and Qing poetry. Stresses major figures, stylistic variations, various poetry schools, new directions in shi verse, and the rise and development of ci. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5630 (3) Early Modern Fiction

Explores selected vernacular and classical fiction of the Ming and Qing periods. Normally focuses on long novels such as Xiyou ji, Sanguo yanyi, Shuihu zhuan, Jin Ping Mei, as well as short stories by Feng Menglong and Ling Mengchu. Texts and selections vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5680 (3) Topics in Early Modern Literature

Examines a specific problem or issue in early modern literature (e.g., the relationships among religion, folklore, and early fiction; the issue of genre and traditional fiction); the role of elite versus popular cultures in the composition of fiction; or the relationship of the state and censorship and the southern philosophical schools to the publication of fiction. Topics vary from year to year. Knowledge of Classical Chinese at the level of CHIN 4220 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5750 (3) Daoism

Detailed examination of scriptures, liturgies, precept codes and hagiographies of Daoism, China's indigenous organized religion. Focusing on origins and development, ethical teachings, ritual activities and world view. Topics include the relationship of Daoism to popular religion, practice of alchemy and self-cultivation, beliefs concerning death and afterlife and structure of the Daoist pantheon.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 4750 and RLST 4750 and RLST 5750

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5810 (3) Modern Literature

Examines selected texts in various genres of Chinese literature from the May Fourth period (beginning 1917) to the establishment of the People's Republic of China (1949). Focuses on major and influential works produced in this fertile period of experimentation with Western, modernist types of literature. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5820 (3) Contemporary Literature

Examines selected texts in various genres of Chinese literature from 1949 (the establishment of the People's Republic of China) to the present. Focuses on major works from the very different literary worlds of Taiwan and mainland China. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5830 (3) History of Chinese Film

Examines the development of narrative film in China from the early twentieth century to today, covering the major periods, styles, and themes developed in Chinese cinema. Texts and selections vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5880 (3) Topics in 20th Century Literature

Examines a specific problem or issue in 20th century literature, e.g., feminist fiction in China, modernism in fiction and poetry, or the role of literary criticism in modern literature. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5890 (3) Topics in Chinese Film

Examines a specific problem or issue in Chinese film, e.g. 5th generation filmmakers, early film, genre (martial arts, melodrama, Hong Kong action, etc.), Taiwan New Cinema, Hollywood crossover. Topics vary from year to year. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5900 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 5980 (1) Practical Issues in Chinese Language Pedagogy

Focuses on practical issues in Chinese language pedagogy for students who will serve as teaching assistants in Chinese language courses. Examines the connection between theory and practice as well as practical methods for teaching Chinese. Equips students with basic Chinese linguistic knowledge. Discusses the use of Communicative Approach in teaching Chinese as a second language. Knowledge of Modern Chinese at the level of CHIN 4120 is required.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 4980

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 6900 (1-6) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

CHIN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chinese
Departmental Category: Asia Content

Civil Engineering (CVEN)

Courses

CVEN 1317 (1) Introduction to Civil and Environmental Engineering

Surveys the broad subject of civil and environmental engineering and professional practice. Includes the subdisciplines of structures, water resources, geotechnics, transportation, environment, and construction. Discusses professional ethics, important skills for engineers, and the engineering design process as it fulfills multiple objectives.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

CVEN 1837 (1-3) Special Topics

Supervised study of special topics of interest to student under instructor guidance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 2012 (3) Introduction to Geomatics

Presents basic techniques of land and construction surveying, including measurement of position, elevation, orientation and length of lines, area, volume and layout calculations. Optical, GPS and GIS equipment and methods are included.

Requisites: Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 2121 (3) Analytical Mechanics 1

Applies mechanics to the study of static equilibrium of rigid and elastic bodies. Includes composition/resolution of forces; moments/couples; equivalent force systems; free-body diagrams; equilibrium of particles and rigid bodies; forces in trusses/beams; frictional forces; first/second moments of area; moments and products of inertia.

Equivalent - Duplicate Degree Credit Not Granted: GEEN 2851 and MCEN 2023

Requisites: Requires a prereq course of PHYS 1110 (min grade C-).

Requires a prereq or coreq course of APPM 2350 or MATH 2400 (min grade C-). Restricted CVEN or EVEN or AREN or AMEN or EPEN or GEEN majors with a CIV, ENR or ARC subplan.

Additional Information: Departmental Category: Mechanics

CVEN 2837 (1-3) Special Topics

Supervised study of special topics of interest to student under instructor guidance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 3022 (3) Construction Surveying

Studies construction and highway surveying, horizontal and vertical curves, earthwork, and analysis of data.

Requisites: Requires prerequisite course of CVEN 2012 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 3032 (3) Photogrammetry

Familiarizes students with characteristics of aerial photographs. Measures and interprets aerial photos for planimetric, topographic, hydrological, soil, and land use surveys. Analyzes and presents field measurements over extensive reaches.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 3111 (3) Analytical Mechanics 2

Studies the motion (kinematics) of particles and rigid bodies, and the forces that cause the motion (kinetics). Newton's laws as well as energy methods are used to study the motion of particles and rigid bodies in two and three dimensions.

Requisites: Requires prerequisite courses of CVEN 2121 (minimum grade C-). Requires a co-requisite course of APPM 2360. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Mechanics

CVEN 3141 (2) Engineering Materials Lab

Additional Information: Departmental Category: Mechanics

CVEN 3161 (3) Mechanics of Materials 1

Addresses concepts of stress and strain; material properties, axial loading, torsion, simple bending, and transverse shear; analysis of stress and strain; and deflections of beams. Includes selected experimental and computational laboratories.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 2063

Requisites: Requires prerequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) or Engineering Management (EMEN) or General (GEEN) Engineering majors with a CIV, ENR or ARC subplan.

Additional Information: Departmental Category: Mechanics

CVEN 3227 (3) Probability, Statistics and Decision

Introduces uncertainty based analysis concepts and applications in the planning and design of civil engineering systems emphasizing probabilistic, statistics, and design concepts and methods.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 3246 (3) Introduction to Construction

Provides a broad view of concerns, activities, and objectives of people involved in construction: the owner, architect/engineer, contractor, labor and inspector. Interactive gaming situation relates these people to the construction contract, plans/specifications, estimates/bids, scheduling, law and financial management. Students with a Business School Real Estate emphasis may be considered for this course.

Requisites: Restricted to students with 36+ units, Civil (CVEN) or Architectural (AREN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Construction

CVEN 3256 (3) Construction Equipment and Methods

Integrated study of construction equipment, methods, and economics. Topics include equipment productivity, equipment selection, and construction engineering design within economic constraints. Examples include earthmoving, concrete formwork, and temporary construction.

Requisites: Requires prerequisite course of CVEN 3246 (minimum grade C-). Restricted to Architectural (AREN) or Civil (CVEN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Construction

CVEN 3313 (3) Theoretical Fluid Mechanics

Basic principles of fluid mechanic. Covers fluid properties, hydrostatics, fluid flow concepts, including continuity, energy, momentum, dimensional analysis and similitude and flow in closed conduits.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 3200 and GEEN 3853 and MCEN 3021

Requisites: Requires prerequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) majors, or General (GEEN) Engineering majors with a CIV or ENR subplan.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 3323 (3) Hydraulic Engineering

Studies hydraulic engineering theory and applications. Topics include incompressible flow in conduits, pipe system analysis and design, open channel flow, flow measurement, analysis and design of hydraulic machinery.

Requisites: Requires prerequisite course of CVEN 3313 or MCEN 3021 or GEEN 3853 or AREN 2120 or CHEN 3200 (all minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 3414 (3) Fundamentals of Environmental Engineering

Emphasizes chemical, ecological and hydrological fundamentals and importance of mass and energy balances in solving environmental engineering problems related to water quality, water and wastewater treatment, air pollution, solid and hazardous waste management, sustainability and risk assessment.

Requisites: Requires prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351 and APPM 1360 or MATH 2300 (all min grade C-). Restricted to CVEN, AREN, EVEN, MCEN, CHEN, GEEN or AMEN majors only.

Additional Information: Departmental Category: Environmental

CVEN 3424 (3) Water and Wastewater Treatment

Introduces design and operation of facilities for treatment of municipal water supplies and wastewater. Provides an engineering application of physical, chemical, and biological unit processes and operations for removal of impurities and pollutants. Involves an integrated design of whole treatment systems combining process elements.

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 3434 (3) Introduction to Applied Ecology

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3434

Requisites: Prereq courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351; (all min C-). Restricted to students with 57-180 credits (Junior or Senior) Civil (CVEN), Environmental (EVEN) or Architectural Engineering (AREN) mjrs.

Additional Information: Departmental Category: Environmental

CVEN 3525 (3) Structural Analysis

Studies structural analysis of statically determinate and indeterminate systems, deflections, energy methods, and force method.

Requisites: Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematic (AMEN) majors only.

Additional Information: Departmental Category: Structures

CVEN 3602 (3) Transportation Systems

Introduces technology, operating characteristics, and relative merits of highway, airway, waterway, railroad, pipeline, and convey or transportation systems. Focuses on evaluation of urban transportation systems and recent transportation innovations.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 3698 (3) Engineering Geology

Highlights the role of geology in engineering minerals; rocks; surficial deposits; rocks and soils as engineering materials; distribution of rocks at and below the surface; hydrologic influences; geologic exploration of engineering sites; geologic hazards; mapping; and geology of underground excavations, slopes, reservoirs and dam sites.

Requisites: Requires a prerequisite or corequisite course of CVEN 2121 or GEEN 2851 or ASEN 2001 or MCEN 2023 and APPM 2350 or MATH 2400 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Geotechnical

CVEN 3708 (3) Geotechnical Engineering 1

Covers basic engineering characteristics of geological materials; soil and rock classifications; site investigation; physical, mechanical, and hydraulic properties of geologic materials; the effective stress principle; soil and rock improvement; seepage analysis; stress distribution; and consolidation and settlement analyses. Selected experimental and computational laboratories.

Requisites: Requires prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to Civil (CVEN), Environmental (EVEN), Architectural (AREN), General (GEEN) or Applied Mathematic (AMEN) majors only.

Additional Information: Departmental Category: Geotechnical

CVEN 3718 (3) Geotechnical Engineering 2

Covers stress analysis and plastic equilibrium, shear strength of soil, bearing capacity, lateral earth pressures, slope stability and underground construction. Analysis and design of shallow and deep foundations, retaining walls and other earth and rock structures. Selected experimental and computational laboratories.

Requisites: Requires prerequisite course of CVEN 3708 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Geotechnical

CVEN 3837 (1-3) Special Topics

Supervised study of special topics of interest to student under instructor guidance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 3930 (6) CEAE Cooperative Education

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program with a university, government agency, or industry. Offered only through Continuing Education and cannot be used to fulfill any of CEAE's degree requirements. 00 GPA or higher.

Repeatable: Repeatable for up to 24.00 total credit hours.

Requisites: At least a 2.75 cumulative GPA is required. Restricted to Civil (CVEN), Environmental (EVEN), or Architectural Engineering (AREN) majors only.

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Building Systems

CVEN 4147 (3) Civil Engineering Systems

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5147

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

CVEN 4161 (3) Mechanics of Materials 2

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5161

Requisites: Requires prerequisite course of CVEN 3161 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 4323 (3) Water Resource Engineering Design

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5423

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4333 (3) Engineering Hydrology

Studies engineering applications of principles of hydrology, including hydrologic cycle, rainfall and runoff, groundwater, storm frequency and duration studies, stream hydrography, flood frequency, and flood routing.

Requisites: Requires prerequisite course of CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 (all minimum grade C-).

Requires prerequisite or corequisite course of CVEN 3227 or APPM 4570 or MCEN 3047 or MCEN 3208 or CHEN 3010.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4353 (3) Groundwater Engineering

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

Requisites: Requires prerequisite course of CVEN 3313 or MCEN 3021 or CHEN 3200 or GEEN 3853 (minimum grade C-).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4383 (3) Groundwater Modeling

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5383

Recommended: Prerequisite CVEN 4353.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4404 (3) Water Chemistry

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4404

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 and CVEN 3414 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) or General (GEEN) Engineering majors only.

Additional Information: Departmental Category: Environmental

CVEN 4414 (1) Water Chemistry Laboratory

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from CVEN 4404 in laboratory experiments and reports.

Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4414

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 and CVEN 3414 (all minimum grade C-). Requires corequisite course of CVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

Additional Information: Departmental Category: Environmental

CVEN 4424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4424

Requisites: Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 2100 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4434 (4) Environmental Engineering Design

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

Equivalent - Duplicate Degree Credit Not Granted: EVEN 4434

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5464 and EVEN 4464

Requisites: Requires prerequisite or corequisite courses of CVEN 3414 and CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 (all minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4474 (3) Hazardous and Industrial Waste Management

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5474

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Environmental

CVEN 4484 (3) Introduction to Environmental Microbiology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5484 and EVEN 4484

Requisites: Requires prerequisite courses of CHEN 1211 and CHEM 1221 or CHEM 1113 and CHEM 1114 or CHEM 1400 or CHEM 1351 and APPM 2350 or MATH 2400 (all minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4511 (3) Introduction to Finite Element Analysis

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5511

Requisites: Requires prerequisite courses of CVEN 3161, CVEN 3525, APPM 2360 or MATH 3130 and MATH 4430 (all minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 4525 (3) Matrix Structural Analysis

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5525

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4535 (1-3) Construction Materials

Introduces material science of engineering materials, such as atomic and crystal structures, defects and phase diagrams; discusses in detail three construction materials: steel, Portland cement concrete and asphalt concrete including classification and composition, engineering properties and testing methods (with three lab sessions). Covers basic of three materials: wood, fiber reinforced polymers and masonry.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of CVEN 3161 or MCEN 2063 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Structures

CVEN 4537 (3) Numerical Methods in Civil Engineering

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5537

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: Miscellaneous

CVEN 4545 (3) Steel Design

Applies basic principles of structural engineering and mechanics to design of steel structures; design of tension members, columns, beams, open-web joists, steel decks, bolts, bolted connections, welding processes, and welded connections.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4554 (3) Fundamentals of Air Quality Management

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Elective for the EVEN air quality track or an environmental concentration course for CVEN.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5554

Requisites: Requires prerequisite courses of APPM 2360 or MATH 2130 and MATH 3430 and CVEN 3313 or CHEN 3200 or MCEN 3021 (all minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 4555 (3) Reinforced Concrete Design

Applies basic principles of structural engineering and mechanics to the design of reinforced concrete structures, including design of beams, columns, slabs, and footings; continuous beams and frames; cast-in-place buildings.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4565 (3) Design of Wood Structures

Applies basic principles of structural engineering and mechanics to the design of wood structures, including the design and analysis of columns, trusses, beams and connections using dimensional lumber, glulam and cross-laminated timber.

Requisites: Requires prerequisite course of CVEN 3525 (minimum grade C-).

Additional Information: Departmental Category: Structures

CVEN 4594 (3) Water Reuse and Reclamation

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5594

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-). Restricted to College of Engineering students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 4718 (3) Mechanics and Dynamics of Glaciers

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5718

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and APPM 2360 and AREN 2110 or GEEN 3852 or MCEN 3012 or ASEN 2002 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 (all minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 4728 (3) Foundation Engineering

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 5728

Requisites: Requires prerequisite course of CVEN 3718 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 4830 (1-4) Special Topics

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Building Systems

CVEN 4833 (1-3) Special Topics

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 4834 (1-3) Special Topics

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Additional Information: Departmental Category: Environmental

CVEN 4835 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Structures

CVEN 4837 (1-3) Special Topics

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

CVEN 4838 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Geotechnical

CVEN 4839 (3-6) Special Topics for Seniors

Offers a supervised study of special topics, under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 4849 (1-3) Independent Study

Involves an independent, in-depth study, research, or design in a selected area of civil or environmental engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 4878 (1-3) Independent Study

Involves an independent, in-depth study, research, or design in a selected area of civil or environmental engineering. Offerings are coordinated with individual faculty. Students should consult the Department of Civil, Environmental, and Architectural Engineering.

Additional Information: Departmental Category: Geotechnical

CVEN 4897 (2) Professional Issues in Civil Engineering

Educates students about the knowledge and skills required for professional civil engineers. Students learn about the path to a professional license, prepare for the FE exam, analyze a situation involving multiple conflicting ethical interests, identify aspects of sustainability in civil engineering projects, and understand the role of project management, public policy, business and public administration, and leadership in civil engineering.

Requisites: Restricted to students with 87-180 credits (Seniors) Civil (CVEN), Environmental (EVEN), or Architectural Engineering (AREN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

CVEN 4899 (4) Civil Engineering Senior Project Design

Provides a simulated real world design and construction planning experience where teams integrate across multiple civil engineering sub-disciplines to create a solution that satisfies multiple constraints, including design, client requirements, budget, schedule, technical, regulatory, and societal. Final deliverables include: detailed design drawings, specifications, cost estimate, project schedule, construction plan, oral and written presentation.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) Civil (CVEN) or General (GEEN) engineering majors only.

Additional Information: Departmental Category: Special Topics

CVEN 5111 (3) Structural Dynamics

Focuses on the response of single- and multi-degree of freedom structures subjected to harmonic, impulsive and arbitrary loads (including earthquake base excitation). Sources and modeling of damping will be discussed. Analytical and numerical solutions will be considered for both linear and nonlinear structural systems. Elastic and inelastic response spectra will be discussed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5131 (3) Continuum Mechanics and Elasticity

Provides foundation for advanced study of structural, mechanical and geo-material behavior and continuum theories in mechanics. Topics: Cartesian tensors, formulation of continuum mechanics for small and large deformation, constitutive laws for elastic solids, energy principles, methods of potentials, formulations and solutions of 2D and 3D elastostatic and elastodynamic problems, analytical and numerical formulations.

Recommended: Prerequisite CVEN 4161.

Additional Information: Departmental Category: Mechanics

CVEN 5147 (3) Civil Engineering Systems

Theory and application of the principles of engineering economics and classical and metaheuristic optimization techniques for evaluating problems in civil and environmental engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4147

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 5161 (3) Advanced Mechanics of Materials I

Covers advanced topics in the mechanics of solids. Some topics such as asymmetric bending of beams, torsion of non-circular cross-sections, are extensions of topics seen in CVEN 3161. Others like 3-D stress and strain analysis, failure theories and stability of columns and frames are new. Includes selected laboratory experiments.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4161

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5206 (3) Design Development

Provides an overview of the development process and proforma, investigates the interrelationship between design decisions and building costs, and evaluates the impact of each major building system on the development budget and schedule. Provides a simulated development experience where students respond to a Request for Proposal, including proformas, design, estimates and outline specifications. Department consent required. Taught intermittently.

Additional Information: Departmental Category: Construction

CVEN 5216 (3) Applied Construction Financial Management

Teaches students to interpret commonly used financial reports in the construction engineering industry sector. Skills developed in this course will better prepare students to become competent consumers of financial information and influence future results the construction business. Models for financing public and private sector projects will also be explored. Taught intermittently.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5226 (3) Construction Safety

Comprehensively studies construction safety in the construction industry. Focuses on advanced safety management issues such as accident causation theory, economic modeling, safety risk quantification and analysis, design for safety, predictive analytics and learning. Skills developed in this course will prepare graduate students to be effective quality and safety managers or researchers.

Additional Information: Departmental Category: Construction

CVEN 5246 (3) Legal Aspects of Construction

Applies law in engineering practice; contracts, construction contract documents, construction specification writing, agency, partnership, and property; types of construction contracts; and legal responsibilities and ethical requirements of the professional engineer. Taught intermittently.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5276 (3) Engineering Risk and Decision Analysis

Acquaints students with the fundamental principles and techniques of risk and decision analysis. Oriented toward project-level decisions in which risk or uncertainty plays a central role. Introduces students to Monte Carlo analyses, and various types of multicriteria decision analyses. Culminates in a larger term project.

Recommended: Prerequisite CVEN 3227 and graduate standing or instructor consent required.

Additional Information: Departmental Category: Construction

CVEN 5286 (3) Design Construction Operations

Considers effective/efficient design of construction operations. Front end planning; construction labor relations; productivity management. Emphasizes construction productivity improvement by group field studies and discrete event simulation modeling. How overtime, changes, weather, and staffing levels influence productivity. Industrial engineering techniques are applied to the construction environment to improve the use of equipment, human, and material resources.

Recommended: graduate standing or department consent required.

Additional Information: Departmental Category: Construction

CVEN 5313 (3) Environmental Fluid Mechanics

Analysis of viscous incompressible flows, with first-principle solutions for environmental fluid flows in oceans, rivers, lakes and the atmosphere. Topics include the Navier-Stokes equations, kinematics, vorticity dynamics, geophysical fluid dynamics, and density stratification.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites APPM 2350 and APPM 2360 and CVEN 3313.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5323 (3) Applied Stream Ecology

Emphasizes the integration of hydrologic, chemical, and biological processes in controlling river, stream, and reservoir ecosystems at several spatial scales. Students apply ecosystem concepts to current environmental and water quality problems and learn field methods in field trips and a team project.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5333 (3) Physical Hydrology and Hydroclimatology

Introduces hydrology as a quantitative science describing the occurrence, distribution and movement of water at and near the surface of the earth. Develops a quantitative understanding of atmospheric water, infiltration, evapotranspiration and surface runoff. Studies global climatology and large scale climate drivers of regional hydrology at interannual time scales. Solves engineering problems related to water resources.

Requisites: Requires prerequisite courses of CVEN 5454 and CVEN 5537 (all minimum grade of C-). Restricted to graduate students only.

Recommended: Prerequisite CVEN 4333.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5343 (3) Transport and Dispersion in Surface Water

Studies transport and dispersion of introduced contaminants in turbulent surface water flows. Emphasizes developing a physical understanding of fluid processes responsible for turbulent dispersion. Includes analytical development, numerical modeling, and experimental approaches to the problem.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5346 (3) Managing Construction and Engineering Projects and Organizations

Explores organizational and managerial issues and concerns facing executives in engineering and construction organizations. Through readings, case studies, simulation exercises, and projects, students are introduced to and apply concepts of strategy, core competencies, vision, innovation, team dynamics, interpersonal influence, organizational design issues, and global projects to engineering and construction organizations.

Additional Information: Departmental Category: Construction

CVEN 5353 (3) Groundwater Hydrology

Studies the occurrence, movement, extraction for use, and quantity and quality aspects of groundwater. Introduces and uses basic concepts to solve engineering and geohydrologic problems.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3313 or AREN 2120 or CHEN 3200 or GEEN 3853 or MCEN 3021 and APPM 2360.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5363 (3) Modeling of Hydrologic Systems

Introduces students to modeling techniques. Focus areas include physical hydrology and hydrometeorology; measurement and inference; climate change impacts; role of scale in hydrology; uncertainty analysis; and a case study project. Projects will examine hydrologic impacts of various drivers such as climate warming or land cover change, utilizing an assessment of historic conditions to better understand and model future disturbance scenarios.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5373 (3) Water Law, Policy, and Institutions

Discusses contemporary issues in water management based on legal doctrine. Identifies legal issues in water resources problems and discusses in close relationship with technical, economic, and political considerations.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5383 (3) Applied Groundwater Modeling

Studies analytical and numerical methods for solving problems of groundwater flow and chemical transport. Emphasizes fundamental modeling techniques and the relationship between the physical system and the model results. Applies models and modeling techniques to solve problems in ground water hydrology using contemporary software.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4383

Recommended: Prerequisites APPM 2360 and CVEN 4353 or CVEN 5353.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5393 (3) Water Resources System and Management

Introduces water resources planning and management as an integrated systems problem that satisfies multiple competing objectives under constraints and uncertainty. Includes problem formulation and solution using decision support systems, optimization with and without uncertainty, stochastic simulation, and multiobjective optimization. Introduces water resources economics and planning under uncertainties such as climate change and increasing urbanization.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5404 (3) Water Chemistry

Introduces chemical fundamentals governing the chemistry of natural and treated waters. Topics include thermodynamics and kinetics of acid and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction, and sorption.

Requisites: Restricted to concurrent BS/MS (C-CVEN or C-EVENCVEN) or graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5414 (3) Water Chemistry Laboratory

Uses experimental and analytical laboratory techniques to develop a better understanding of the concepts of aquatic chemistry and to investigate water chemistry in treated and natural water systems. Techniques include titration, spectrophotometry, gas chromatography, other advanced instrumentation, sampling, portable analyses, and basic statistics and experimental design. Course focuses on water chemistry of Boulder Creek and other local waters.

Requisites: Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-). Requires corequisite course of CVEN 5424.

Additional Information: Departmental Category: Environmental

CVEN 5423 (3) Water Resources Engineering Design

Studies principles and techniques of water resources engineering design. Introduces environmental modeling under uncertainty, stormwater design, precipitation estimation and flow routing. Surveys hydropower, reservoir management and water resources economics.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4323

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical processes that impact the fate and transport of organic contaminants in natural and engineered systems. Emphasizes both equilibrium and kinetic aspects, including solubility, vapor pressure, air-water exchange, sorption, abiotic redox reactions, and photodegradation.

Additional Information: Departmental Category: Environmental

CVEN 5434 (3) Environmental Engineering Design

Team-based design of facilities or processes for water or wastewater or solid waste treatment or remediation under multiple real-world constraints. Department consent required.

Recommended: Prerequisite CVEN 5524 or CVEN 5534 or CVEN 5474.

Additional Information: Departmental Category: Environmental

CVEN 5444 (3) Municipal Des Proj

Additional Information: Departmental Category: Environmental

CVEN 5454 (3) Statistical Methods for Natural and Engineered Systems

Applies traditional and modern probability and statistical methods to environmental, hydrological, climatological and engineering data analysis. Topics include: basic probability, data visualization, fitting univariate and multivariate distributions, Monte Carlo simulations, extreme value distributions, confidence intervals and hypothesis testing, nonparametric density estimators, linear regression, and Bayesian analysis. The data analysis tool, R, is used throughout the course.

Additional Information: Departmental Category: Environmental

CVEN 5464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4464 and EVEN 4464

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5474 (3) Hazardous and Industrial Waste Management

Evaluates processes used for treatment of wastes requiring special handling and disposal: toxic organic chemicals, heavy metals, acidic, caustic and radioactive waste material. Discusses techniques for destruction, immobilization and resource recovery and assessment of environmental impact of treatment process end products.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4474

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5484 (3) Applied Microbiology and Toxicology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4484 and EVEN 4484

Additional Information: Departmental Category: Environmental

CVEN 5494 (3) Surface Water Quality Modeling

Examines the relationships among air, water, and land pollution, water quality, and beneficial uses. Using models, develops the ability to quantify and predict the impacts of pollutants in the aquatic environment, and to develop approaches to minimize unfavorable water quality conditions. Department consent required.

Additional Information: Departmental Category: Environmental

CVEN 5511 (3) Introduction to Finite Element Analysis

Covers systematic formulation of finite element approximation and isoparametric interpolation (weighted residual and energy methods, triangular and quadrilateral elements). Includes computation applications to the solution of one- and two-dimensional stress-deformation problems and steady and transient heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4511

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5514 (3) Bioremediation

Advanced study on biological processes used to treat toxic organic and inorganic compounds contained in contaminated water, air, and soil; design and evaluation of in situ toxic compound biotransformation; fundamentals of phytoremediation; critical reviews of current literature on bioremediation.

Recommended: Prerequisite CVEN 4484 or CVEN 5424 or CVEN 5484.

Additional Information: Departmental Category: Environmental

CVEN 5524 (3) Drinking Water Treatment

Provides advanced study on theory-of-treatment processes, including design and operation of municipal water supplies.

Recommended: Prerequisite CVEN 4464 or CVEN 5464 or graduate standing or instructor consent required.

Additional Information: Departmental Category: Environmental

CVEN 5525 (3) Matrix Structural Analysis

Covers matrix formulation of principles of structural analysis and development of direct stiffness and flexibility methods for analysis of 2D and 3D structures. Variational formulation of the finite element method. Geometric nonlinearity. Familiarity with Matlab programming is expected.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4525

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5534 (3) Wastewater Treatment

Covers the processes used to treat municipal wastewater, focusing on biological processes. Includes: design of aerobic, anoxic, anaerobic and suspended growth technologies to remove and transform pollutants; design and assessment of treatment approaches that recover energy, nutrients and water from wastewater; application of fundamental concepts of aquatic chemistry, environmental microbiology and computational models.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 5404 and CVEN 5484 and CVEN 5464.

Additional Information: Departmental Category: Environmental

CVEN 5537 (3) Numerical Methods in Civil Engineering

Introduces the use of numerical methods in the solution of civil engineering problems, emphasizing obtaining solutions with high-speed electronic computers. Applies methods to all types of civil engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4537

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

CVEN 5544 (3) Solid Waste Management and Resource Recovery

Covers the scope of the nonhazardous solid waste problem and regulations that drive its management; discussions of nonengineering factors that impact waste management and recycling; design of incinerators, composting facilities, and landfills used to treat and dispose of solid waste.

Recommended: Prerequisite CVEN 3414.

Additional Information: Departmental Category: Environmental

CVEN 5554 (3) Fundamentals of Air Quality Management

Introduces engineering methods for the study of air quality. Topics include: indoor air quality, greenhouse gases, dispersion modeling, source apportionment modeling, chemistry of combustion, pollution sources and controls, human exposure to air pollutants. A focus on Engineering for Developing Communities runs throughout. Required for CVEN environmental engineering graduate students.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4554

Additional Information: Departmental Category: Environmental

CVEN 5555 (3) Structural Reliability

Explores principles and methods of structural reliability, and formulates bases for design to insure adequate safety and performance of elements and structural systems. Undergraduates may enroll with the permission of the instructor.

Requisites: Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5564 (3) Water Profession: Leadership & Communication

Develops and improves the skills and tools needed for graduate students and young professionals. Focusing on highly effective leaders; leadership with impact; effective communication tools; and communicating with teams, city councils, governing boards, and the public.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environmental

CVEN 5565 (3) Life-Cycle Engineering of Civil Infrastructure Systems

Philosophical and analytical issues for lifetime design and operation of civil systems. Optimization tradeoffs of construction, management, and sustainability. Utility of operation and service, including present-value economic analysis. Decision-making alternatives of safety and performance, including hazards consideration. Undergraduates may enroll with the permission of the instructor.

Recommended: Prerequisite CVEN 3227 or equivalent.

Additional Information: Departmental Category: Structures

CVEN 5574 (3) Water Utility Management: Current Issues and Future Challenges

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on management, leadership, communication and utility financial in the new water profession era. Undergraduate seniors may contact instructor for permission to enroll.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5575 (3) Advanced Topics in Steel Design

Covers steel structure design and analysis. Includes plate girders, moment connections for beams, design of multistory frames, and other topics determined by class interest. Undergraduate may enroll with permission of the instructor.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4545.

Additional Information: Departmental Category: Structures

CVEN 5584 (3) Water Profession: Financial and Management

Develops the skills and tools for graduate students and young professionals to work in the water profession. Focuses on financing water services, capital planning, rates, management planning, staffing and organization and critical thinking. Undergraduates may request instructor permission to enroll.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5585 (3) Advanced Topics in Reinforced Concrete Design

Covers design and analysis topics for prestressed concrete and/or reinforced concrete structures. Includes review of the current ACI design code, slabs, prestressed concrete, seismic design, folded plates and shells, finite element analysis, and other topics determined by class interest. Undergraduates may enroll with the permission of the instructor.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4555.

Additional Information: Departmental Category: Structures

CVEN 5594 (3) Water Reuse and Reclamation

Explores development of a safe, reliable and acceptable program for reusing impaired waters. As fresh water becomes scarcer around the world, communities are looking for security through development of new water resources. Reuse of impaired water is one solution to the growing water crisis. Focus is on advanced treatment technologies with emphasis on public perception, economics and regulations.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4594

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3141 and CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 5604 (3) UV Processes in Environmental and Engineered Systems

Provides a fundamental basis for design of UV processes in water and wastewater treatment. Includes principles of photochemistry and photobiology. Applications to disinfection of water and degradation of chemical compounds in the environment. Design of UV disinfection systems and reactors and advanced oxidation processes. Environmental UV-based decay of pollutants.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3414 and CVEN 3424.

Additional Information: Departmental Category: Environmental

CVEN 5614 (3) Bioenergy & Bioresource Recovery

Introduces fundamental theories and applied technologies used in production and conversion of renewable biomass including waste materials into bioenergy and other value-added products. Conducts quantitative evaluations on conversion processes such as renewable biogas production, electricity generation, liquid fuels, metal and nutrients recovery and organic chemical production.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 4484.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environmental

CVEN 5628 (3) Seepage and Slopes

Covers fundamental principles of seepage in soils under both saturated and unsaturated conditions and limit equilibrium solution to slope stability problems. The seepage effects on slope stability are analyzed in detail and both conventional slope stability method and the finite element technique are applied to solving the engineering problems.

Recommended: Prerequisites CVEN 3708 and CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5678 (3) Soil Improvement and Reinforcement

Provides students with principles and working knowledge of design and construction procedures in soil stabilization, retaining structures, geosynthetics, and soil reinforcement.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5688 (3) Environmental Geotechnics

Provides an understanding of the use of geotechnical concepts in the analysis and design of environmental systems. Focus is placed on the evaluation of waste containment facilities. Including relevant saturated, unsaturated, and multiphase flow mechanisms in cover and liner systems. Includes stability analyses for landfills and geosynthetic interface shear strength. Covers relevant aspects of mining geotechnics and remediation technologies of contaminated sites.

Additional Information: Departmental Category: Geotechnical

CVEN 5708 (3) Soil Mechanics

Offers an advanced course in soil mechanics. Coverage includes basic principles of continuum mechanics; elasticity, viscoelasticity, and plasticity theories applied to soils; effective stress principle; consolidation; shear strength; critical state concepts; and constitutive, numerical, and centrifuge modeling.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5718 (3) Mechanics and Dynamics of Glaciers

Develops a quantitative physical basis for understanding the functions of snow, ice and glaciers in the environment, with emphasis on developing an understanding of continuum mechanics and thermodynamics and their application to Earth systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4718

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5728 (3) Foundation Engineering

Focuses on geotechnical design of shallow and deep foundations, including spread footings, mats, driven piles and drilled piers. Coverage includes bearing capacity, settlement, group effects and lateral load capacity of the various foundation types. Additional topics include subsurface exploration, construction of deep foundations and analysis of pile behavior using wave equation and dynamic monitoring methods.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4728

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geotechnical

CVEN 5738 (3) Applied Geotechnical Analysis

Studies applications of limiting equilibrium and limit plasticity analysis methods to stability problems in geotechnical engineering, such as slopes, lateral earth pressures on retaining structures, and bearing capacities of foundations. Also includes elastic and consolidation analysis of deformations in soil structures.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5748 (3) Design of Earth Structures

Covers theory, design, and construction of earth embankments and waste facilities, including isolation systems. Uses published data, field exploration, and laboratory tests on soils and rock in investigating foundations and construction materials. Involves principles of compaction and settlement, permeability analysis, landslide recognition and control, use of composite clay, and liner systems.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5758 (3) Flow Processes in Soils

Examines fundamental principles of flow through porous media and related engineering problems. Topics include the saturated seepage theory and flow nets; the unsaturated flow theory; suction-saturation and saturation-hydraulic conductivity relationships; nonlinear finite strain consolidation and desiccation theory; laboratory and field testing methods for determining material characteristics; and numerical models for flow-related engineering problems.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5768 (3) Introduction to Rock Mechanics

Nature of rocks and rock masses; engineering properties rock and rock mass; rock mass classifications; planes of weakness; application of rock mechanics to design of rock slopes, underground excavations, and foundations.

Recommended: Prerequisites CVEN 3708 and CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5788 (3) Computational Modeling in Geotechnical Engineering

Introduces computational modeling for geotechnical engineering applications such as the Discrete Element Method (DEM) for granular materials, nonlinear Finite Element Analysis (FEA) of seepage, coupled soil elastoplastic consolidation, elastoplasticity models for soil and rock, and advanced computational methods for failure in soil and rock. Uses DEM, FEA, and other software programs for analysis.

Requisites: Requires a prerequisite course of CVEN 5708 (minimum grade C-).

Additional Information: Departmental Category: Geotechnical

CVEN 5798 (3) Dynamics of Soils and Foundations

Covers fundamental characterization of soils, foundations and structures under general dynamic and earthquake loads. Principles of vibrations and wave propagation for 1D, 2D, 3D. In-situ and laboratory determination of dynamic soil properties; methods for site response analysis, foundation vibrations, dynamic soil-structure interaction and liquefaction problems.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 5818 (3) Geotechnical Earthquake Engineering

Familiarizes students with the fundamentals of engineering seismology, soil and structural dynamics, and the modern practice of geotechnical earthquake engineering. Focuses on describing earthquake hazards and methods for seismic analysis and design.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CVEN 5798.

Additional Information: Departmental Category: Geotechnical

CVEN 5822 (3) Geographical Information Systems for Civil and Environmental Systems

Theory and use of geographical information systems in civil engineering, environmental studies, natural resources and other related disciplines. Topics include spatial data models, data capture, global positioning system, database linkage, use in design, analysis and implementation. Laboratory work includes applications of Arc-View and Arc-GIS software.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 5830 (3) Special Topics for Seniors/Grads

Department consent required.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Building Systems

CVEN 5831 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 5833 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 5834 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environmental

CVEN 5835 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 5836 (1-3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Construction

CVEN 5837 (3) Special Topics for Seniors/Grads

Supervised study of special topics of interest to students under instructor guidance. Department consent required.

Additional Information: Departmental Category: Miscellaneous

CVEN 5838 (3) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Geotechnical

CVEN 5849 (1-3) Independent Study

Available only through approval of graduate advisor. Subject arranged to fit needs of student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Topics

CVEN 5919 (3) Sustainable Community Development 1

Focuses on the fundamental tools necessary to address sustainable community development projects in low-income communities (LICs). Topics include: human development, sustainable development, and presentation of an integrative and participatory framework for development projects in LICs. The framework consists of a combination of development and engineering project management tools. Framework is illustrated through case studies and student-driven team projects.

Requisites: Restricted to students with sub-plan of Engineering Developing Communities (EDC).

Additional Information: Departmental Category: Special Topics

CVEN 5929 (3) Sustainable Community Development 2

Covers the principles, practices and strategies of appropriate technology as part of an integrated and systems approach to community-based development. Course content areas include technical issues in development, environmental health and communicable disease, appropriate and sustainable technologies with hands-on workshops, and global cooperation in development.

Requisites: Requires prerequisite course of CVEN 5919 (minimum grade C-). Restricted to students with EDC Sub-Plan.

Additional Information: Departmental Category: Special Topics

CVEN 5939 (3) Sustainable Community Development Field Practicum

Provides a supervised in-field practicum experience in which the student applies theories and concepts learned in CVEN 5919 and CVEN 5929.

Requisites: Requires prerequisites courses of CVEN 5919 and CVEN 5929 (all minimum grade C-). Restricted to students with sub-plan of Engineering Developing Communities (EDC).

Additional Information: Departmental Category: Miscellaneous

CVEN 5969 (1-3) Water, Sanitation, and Hygiene

Studies the fundamentals behind effective hygiene and remediation processes and engineering solutions developed/ designed for specific international problems. Approaches to hygiene, clean water and sanitation in lesser industrialized countries often demand alternative solutions to those developed for industrialized societies. Explores issues and solutions developed to tackle these problems.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CVEN 3424 and CVEN 3414.

Additional Information: Departmental Category: Environmental

CVEN 6161 (3) Advanced Mechanics of Materials 2

Fundamentals of continuum mechanics, finite deformations, Lagrangian finite strains, Cauchy and Piola Kirchoff stress tensors, plasticity and thermo-elasticity, elements of damage mechanics, elements of fracture mechanics, rheological and viscoelastic theories, and modern experimental techniques.

Recommended: Prerequisite CVEN 5161.

Additional Information: Departmental Category: Mechanics

CVEN 6323 (3) Urban Stormwater Infrastructure Systems

Evaluation and design of more sustainable urban stormwater infrastructure systems including street inlets, on-line and off-line surface storage and infiltration systems. Integrated design for major, minor, and micro storms to provide flood control and drainage as well as control of pollution from stormwater runoff. Simulation and optimization models will be used.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6333 (3) Introduction to Multi-Scale Variability and Scaling in Hydrology

Provides a foundational physical understanding of channel networks, runoff, precipitation, and evapotranspiration at multiple spatial scales of drainage basins using modern analytical concepts for understanding non-linear phenomena, e.g., fractals, multifractals, statistical scaling, criticality, and renormalization.

Requisites: Requires a prerequisite course of CVEN 5333 (minimum grade C-).

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6383 (3) Flow and Transport through Porous Media

Studies basic physics of flow and transport of water, air, and other fluid mixtures through a porous medium. Course topics are relevant to applications in contaminant hydrology, contaminant transport in aquifers, hazardous waste management, geohydrology, soil physics, and geoenvironmental engineering.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6393 (1) Hydrologic Sciences and Water Resources Engineering Seminar

Provides a broad introduction to a variety of research topics from hydrologic sciences and water resources engineering. Offered as a one-hour weekly seminar by the departmental water faculty, graduate students, and external speakers.

Requisites: Restricted to graduate student Civil (CVEN) Engineering students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6414 (3) Aquatic Surfaces and Particles

Examines the role of surfaces and particles in the fate and transport of contaminants in the aquatic environment. Emphasizes modeling of absorption, dissolution, precipitation, surface-catalyzed reactions, and coagulation and filtration kinetics.

Requisites: Requires prerequisite course of CVEN 5404 or GEOL 5280 (minimum grade C-).

Additional Information: Departmental Category: Environmental

CVEN 6511 (3) Nonlinear Finite Element Analysis of Solids and Porous Media

Covers constitutive modeling, multiphase mechanics, and finite element implementation of constitutive models and coupled solid-fluid mechanical governing equations for inelastic porous media at small strain. Considers transient and steady state conditions. Analyzes structural, geotechnical, geological, mechanical, biomechanical, and other related modern engineering problems. Uses general purpose finite element software program for implementation and analysis.

Additional Information: Departmental Category: Mechanics

CVEN 6525 (3) Nonlinear Analysis of Framed Structures

Explores theoretical underpinnings of nonlinear static and dynamic analysis of framed structures, along with exposure to the corresponding programming techniques in Matlab. Topics covered are: flexibility and fiber based beam-column element formulation; structural, section and fiber plasticity; geometric and material nonlinearities; nonlinear pushover and transient analysis of framed structures.

Requisites: Requires prerequisite course of CVEN 5525 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 6595 (3) Earthquake Engineering

Analyzes and designs structures for earthquake load covering: properties of earthquake ground motions, ground motion prediction equations, seismic hazard analysis, response spectra, response of linear and nonlinear structures, construction of design spectra, seismic design methods, and building code requirements.

Requisites: Requires prerequisite course of CVEN 5111 (minimum grade of C-). Restricted to graduate students only.

Additional Information: Departmental Category: Structures

CVEN 6830 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Building Systems

CVEN 6831 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Mechanics

CVEN 6832 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6833 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6834 (1-3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Environmental

CVEN 6835 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Structures

CVEN 6836 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Construction

CVEN 6837 (3) Sp Tpcs Comp Graphics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miscellaneous

CVEN 6838 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Geotechnical

CVEN 6839 (1-3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 6943 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6944 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Environmental

CVEN 6945 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Structures

CVEN 6946 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Construction

CVEN 6947 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

CVEN 6948 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Geotechnical

CVEN 6949 (1) Master's Degree Cand

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Special Topics

CVEN 6951 (1-4) Master's Thesis

Additional Information: Departmental Category: Mechanics

CVEN 6952 (1-4) Master's Thesis

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6953 (1-6) Master's Thesis

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6954 (1-6) Master's Thesis

Additional Information: Departmental Category: Environmental

CVEN 6955 (1-6) Master's Thesis

Additional Information: Departmental Category: Structures

CVEN 6956 (1-6) Master's Thesis

Additional Information: Departmental Category: Construction

CVEN 6957 (1-4) Master's Thesis

Additional Information: Departmental Category: Miscellaneous

CVEN 6958 (1-6) Master's Thesis

Additional Information: Departmental Category: Geotechnical

CVEN 6959 (1-4) Master's Thesis

Additional Information: Departmental Category: Special Topics

CVEN 6961 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Mechanics

CVEN 6962 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Surveying and Transportation

CVEN 6963 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 6964 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Environmental

CVEN 6965 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Structures

CVEN 6966 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Construction

CVEN 6967 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Miscellaneous

CVEN 6968 (1-3) Master's Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Geotechnical

CVEN 6969 (1-3) Masters Report

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 7111 (3) Advanced Structural Dynamics

Includes general vibrations of civil engineering structures and their response to various types of time-dependent loads.

Requisites: Requires prerequisite course of CVEN 5111 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 7141 (3) Plates and Shells

Teaches mathematical theories of plate and shell structures and their applications. Involves numerical finite element solutions of plates and shells of various shapes under static and dynamic loadings.

Requisites: Requires prerequisite courses of CVEN 5131 or CVEN 5161 (minimum grade C-).

Additional Information: Departmental Category: Mechanics

CVEN 7161 (3) Fracture Mechanics

Includes three parts: 1) fundamentals through rigorous mathematical formulations of linear/nonlinear elastic fracture mechanics, 2) materials' theoretical strength, including metals, granular materials, polymers and steel, 3) numerical (finite element) methods in fracture mechanics. Heavy emphasis on project and independent work.

Requisites: Requires prerequisite courses of CVEN 5511 and CVEN 6161 (all minimum grade of C-).

Additional Information: Departmental Category: Mechanics

CVEN 7206 (1) CEM PhD Seminar

Provides an overview of the research process and research methods in construction engineering and management. Students will study and evaluate different research methods and designs in an aim to prepare students to conduct and evaluate research. Taught intermittently.

Additional Information: Departmental Category: Construction

CVEN 7511 (3) Computational Finite Inelasticity and Multiphase Mechanics

Covers kinematics, thermodynamics, coupled balance equations and constitutive models, numerical time integration, and finite element implementation of finite strain inelasticity and multiphase mechanics. Kinematics of multiplicative decomposition, and finite strain mixture theory. Linearization for global nonlinear Newton-Raphson and solution algorithm of nonlinear constitutive models and coupled balance equations.

Recommended: Prerequisites CVEN 5131 and CVEN 5511 and CVEN 6511.

Additional Information: Departmental Category: Mechanics

CVEN 7718 (3) Engineering Properties of Soils

Emphasizes engineering aspects of soil mechanics. Implications of soil strength, volume change, consolidation behavior in engineering problems such as slope stability, deformation of retaining walls, surface subsidence due to tunneling. Time effects in soil/long-term bearing capacity of piles. Laboratory determination of constitutive parameters of soils. Field tests/their correlations with soil properties. Case studies using finite element software.

Requisites: Requires prerequisite course of CVEN 5708 (minimum grade of C-).

Additional Information: Departmental Category: Geotechnical

CVEN 7788 (3) Soil Behavior

Topics include soil mineralogy, formation of soils through sedimentary processes and weathering, determination of soil composition, soil water, colloidal phenomena in soils, fabric property relationships, analysis of mechanical behavior including compressibility, strength and deformation, and conduction phenomena in terms of physicochemical principles. Involves applications for stabilization and improvement of soils, and disposal of waste materials.

Recommended: Prerequisite CVEN 3718.

Additional Information: Departmental Category: Geotechnical

CVEN 7831 (1-3) Sp Tpc-Constitutive Mech

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Mechanics

CVEN 7838 (3) Special Topics

Additional Information: Departmental Category: Geotechnical

CVEN 7849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 8849 (3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Topics

CVEN 8991 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Mechanics

CVEN 8992 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Surveying and Transportation

CVEN 8993 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Fluid Mechanics and Water Resources

CVEN 8994 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Environmental

CVEN 8995 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Structures

CVEN 8996 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Construction

CVEN 8997 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Miscellaneous

CVEN 8998 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Geotechnical

CVEN 8999 (1-10) Doctor's Thesis

Additional Information: Departmental Category: Special Topics

Classical Greek Language (GREK)

Courses

GREK 1013 (4) Beginning Classical Greek 1

For students with no previous knowledge of Greek. Introduces basic grammar and vocabulary.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Greek

GREK 1023 (4) Beginning Classical Greek 2

Completes the presentation of grammar and introduces reading of literature.

Recommended: Prerequisite GREK 1013.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Greek

GREK 3013 (1) Readings in the Greek New Testament and Septuagint

Readings in ancient (koine) Greek from the New Testament and the Septuagint. Students aim to achieve fluency in reading and to enrich their knowledge of key terms and ideas borrowed from the Greek past in the early Christian tradition. Formerly CLAS 3013.

Repeatable: Repeatable for up to 4.00 total credit hours.

Recommended: Prerequisites GREK 1013 and GREK 1023.

Additional Information: Departmental Category: Greek

GREK 3113 (3) Intermediate Classical Greek 1

Reading of selected prose texts of authors in ancient Greek such as Plato, Xenophon, Lysias, and selections from the Greek New Testament. Incorporates review of grammar.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites GREK 1013 and GREK 1023.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Greek

GREK 3123 (3) Intermediate Classical Greek 2

Reading of selections from Homer or a Greek tragedy in ancient Greek, with attention to literary form and context as well as advanced grammar and syntax.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites GREK 1013 and GREK 1023 and GREK 3113.

Additional Information: Departmental Category: Greek

GREK 4013 (3) Topics in Greek Prose

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

Equivalent - Duplicate Degree Credit Not Granted: GREK 5013

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Greek

GREK 4023 (3) Topics in Greek Poetry

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

Equivalent - Duplicate Degree Credit Not Granted: GREK 5023

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Greek

GREK 4093 (3) Survey of Greek Literature

Greek literary history in ancient Greek from Homer to the Hellenistic age.

Equivalent - Duplicate Degree Credit Not Granted: GREK 5093

Recommended: Prerequisites GREK 3113 and GREK 3123.

Additional Information: Departmental Category: Greek

GREK 4843 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Greek

GREK 5013 (3) Topics in Greek Prose

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Thucydides, Herodotus, Plato, Aristotle, Attic Orators).

Equivalent - Duplicate Degree Credit Not Granted: GREK 4013

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 5023 (3) Topics in Greek Poetry

Author or topic in ancient Greek specified in the online Schedule Planner (e.g., Homer, Hesiod, lyric poetry, tragedy, comedy).

Equivalent - Duplicate Degree Credit Not Granted: GREK 4023

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 5093 (3) Survey of Greek Literature

Greek literary history in ancient Greek from Homer to the Hellenistic age.

Equivalent - Duplicate Degree Credit Not Granted: GREK 4093

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 6003 (3) Graduate Reading

Author or topic specified in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 6843 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

GREK 7013 (3) Graduate Seminar in Greek Literature

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Greek

Classics (CLAS)

Courses

CLAS 1010 (3) The Study of Words

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: LING 1010

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 1020 (3) Argument from Evidence: Critical Writing about the Ancient World

Introduces students to writing about the ancient world, with special attention to the possibilities and the limitations of ancient source-material. Taught as a writing workshop, with emphasis on critical thinking, analysis, argument and inquiry. While the course reads foundational ancient texts, the skills acquired will be broadly useful among humanities disciplines.

Additional Information: Arts Sci Core Curr: Written Communication

Departmental Category: Literature, Culture, and Thought

MAPS Course: English

CLAS 1030 (3) Introduction to Western Philosophy: Ancient

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 1010

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Literature, Culture, and Thought

CLAS 1051 (3) The World of the Ancient Greeks

Surveys of the emergence, major accomplishments, failures and the decline of the ancient Greeks, from the Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.). No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1051

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Ancient History

CLAS 1061 (3) The Rise and Fall of Ancient Rome

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1061

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Ancient History

CLAS 1071 (3) Ancient Sport and Spectacle

Surveys the development, evolution and impact of sport and spectacle in the Greco-Roman world through the deconstruction of games during the Christian era of the Roman Empire. Examines, among other relevant topics, games in the Homeric tradition, the development of the Greek Olympics and Roman spectacles including the circus, amphitheaters and gladiators.

CLAS 1100 (3) Greek Mythology

Covers the Greek myths as documents of early human religious experience and imagination, the source of Greek culture, and part of the fabric of Western cultural tradition. Of particular interest to students of literature and the arts, psychology, anthropology, and history. No Greek or Latin required.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 1110 (3) Gods, Monsters and Mortals: Literature of Ancient Greece

Read about mythological heroes and historical individuals from Achilles to Socrates. Explore why Greek authors told stories the way they did and what those stories might have meant to them and might mean to us. Ancient texts in English translation.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 1115 (3) Masterpieces of Greek Literature in Translation

Students read about mythological heroes and historical individuals from Achilles to Socrates in Greek literature. Class discusses why the Greeks told stories the way they did and what those stories might have meant to them and might mean to us.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Honors

CLAS 1120 (3) Power and Passion in Ancient Rome

Read about mythological heroes and historical individuals from Romulus to Catiline and the emperors Augustus and Nero. Explore why Roman authors told stories the way they did and what those stories might have meant and might mean to us. Ancient texts in English translation.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 1140 (3) Bread and Circuses: Society and Culture in the Roman World

Surveys the outstanding achievements of Roman culture and society as reflected in literature; philosophy and art; private and official religion; and legal and political thought. No Greek or Latin required.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Historical Context
Departmental Category: Literature, Culture, and Thought

CLAS 1509 (4) Trash and Treasure, Temples and Tombs: Art and Archaeology of the Ancient World

Introduces the art and archaeology of ancient Egypt, Mesopotamia, Greece and Rome, examining various ancient approaches to power, religion, death and the human body. Analyzes art, architecture and everyday trash to learn about ancient humanity.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 1509
Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.
Additional Information: Arts Sci Core Curr: Historical Context
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art and Archaeology

CLAS 2020 (3) Science in the Ancient World

Covers the development of scientific modes of thought, theory, and research from mythological origins (e.g., Hesiod's poetry) through pre-Socratic philosophers. Culminates in theories and research of Plato and Aristotle, including the Roman Empire. Students read original sources in translation. No Greek or Latin required.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 2029 (3) Art and Archaeology of Ancient Egypt

Emphasizes the origin of the Egyptian culture, its importance and its impact on other cultures. In addition, the different points of view of various scholars are discussed with a comparative study of the ancient Egyptian culture and modern culture of Egypt and the Middle East. Formerly ANTH 1160.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 2029

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art and Archaeology

CLAS 2039 (3) Greek Art and Archaeology

Covers prehistoric Aegean through the fourth century B.C.E., considering architecture, pottery, painting, sculpture and personal ornament. Societal customs such as use of space and burial patterns are considered as well as art and its uses, to help understand developments in Greek culture. Formerly CLAS 3039.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 2039

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art and Archaeology

CLAS 2041 (3) War and Society in Ancient Greece

Studies Greek warfare in its cultural, social and economic contexts, in the light of anthropological comparisons and modern theories. No Greek or Latin required.

Additional Information: Departmental Category: Ancient History

CLAS 2049 (3) Introduction to Roman Art and Architecture

Introduces the monuments and sites of the ancient Roman world from the foundation of Rome (753 B.C.E.) to Constantine (306-307 C.E.). Emphasizes the relationship of art, architecture, and artifacts to the political, social, and religious institutions of Italy and the provinces. Formerly CLAS 3049.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 2049

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Art and Archaeology

CLAS 2100 (3) Gender and Sexuality in Ancient Greece

Examines evidence of art, archaeology, and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature, and daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2100

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Literature, Culture, and Thought

CLAS 2110 (3) Gender and Sexuality in Ancient Rome

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2110

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Human Diversity
Departmental Category: Literature, Culture, and Thought

CLAS 2610 (3) Paganism to Christianity

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2614

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Literature, Culture, and Thought

CLAS 3009 (3) Modern Issues, Ancient Times

Considers issues of vital importance to humans, both now and in ancient times. Topics such as food, death, sex, family, literacy, or power are explored to consider how ancient societal norms and attitudes evolved and how they relate to modern culture. Draws on material and literary evidence to develop an understanding of the complexities of ancient life. Formerly CLAS 2009.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 3009

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Art and Archaeology

CLAS 3019 (3) Pompeii and the Cities of Vesuvius

Introduces the towns and villas buried by the eruption of Mt. Vesuvius in 79 C.E. Explores the layout and decoration of ancient Roman houses, the variety of artifacts uncovered as evidence for daily life and the history of the excavations.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 3019

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Art and Archaeology

CLAS 3400 (3) Special Topics in Classics

Topics in Greek, Latin or Classical civilization.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5021 and HIST 4021

Additional Information: Departmental Category: Ancient History

CLAS 4031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5031 and HIST 4031

Recommended: Prerequisite one of the following CLAS 1051, 1509, 2041, 2039, 4021, 4041, 4139, 4149, GREK 3113, HIST 1051, 4021, 4041.

Additional Information: Departmental Category: Ancient History

CLAS 4040 (3) Seminar in Classical Antiquity

Examines an advanced topic in classical language, literature, history, philosophy, art, or culture. Combines the techniques of philology with a critical approach to the literary and material legacy of the past.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Requisite second-year proficiency in Greek or Latin.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5041 and HIST 4041 and PHIL 4210

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1061 or HIST 1011 or HIST 1051 or HIST 1061 or PSCI 2004 or PHIL 3000.

Additional Information: Departmental Category: Ancient History

CLAS 4061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5061 and HIST 4061 and HIST 5061

Additional Information: Departmental Category: Ancient History

CLAS 4071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5071 and HIST 4071

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Ancient History

CLAS 4081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5081 and HIST 4081

Additional Information: Departmental Category: Ancient History

CLAS 4091 (3) The Roman Empire

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5091 and HIST 4091

Additional Information: Departmental Category: Ancient History

CLAS 4109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous course work on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5109 and ARTH 4109 and ARTH 5109

Recommended: Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4110 (3) Greek and Roman Epic

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5110 and HUMN 4110

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 4119 (3) Roman Sculpture

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5119 and ARTH 4119 and ARTH 5119

Additional Information: Departmental Category: Art and Archaeology

CLAS 4120 (3) Greek and Roman Tragedy

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5120 and HUMN 4120

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 4129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5129 and ANTH 4129 and ANTH 5129 and ARTH 4129

Additional Information: Departmental Category: Art and Archaeology

CLAS 4130 (3) Greek and Roman Comedy

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5130 and HUMN 4130

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Literature, Culture, and Thought

CLAS 4139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5139 and ARTH 4139 and ARTH 5139

Additional Information: Departmental Category: Art and Archaeology

CLAS 4140 (3) The Greek and Roman Novel

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5140 and HUMN 4131

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4149 (3) Greek Cities and Sanctuaries

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5149 and ARTH 4149

Additional Information: Departmental Category: Art and Archaeology

CLAS 4169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture.

Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5169 and ARTH 4169 and ARTH 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4199 (3) Roman Architecture

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures, including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5199 and ARTH 4199

Additional Information: Departmental Category: Art and Archaeology

CLAS 4209 (6) Classical Archaeological Field Methods

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4209 and CLAS 5209

Recommended: Prerequisites CLAS 1509 or ARTH 1509 or ARTH 2039 and ARTH 2049.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 4420.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5229 and ARTH 4229 and ARTH 5229

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Art and Archaeology

CLAS 4269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5269 and ARTH 4269 and ARTH 5269

Recommended: Prerequisite CLAS 1509 or ARTH 1509.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Art and Archaeology

Departmental Category: Asia Content

CLAS 4761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 5761 and HIST 4761 and HIST 5761

Additional Information: Departmental Category: Ancient History

CLAS 4840 (1-4) Independent Study

No Greek or Latin required.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 4849 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Art and Archaeology

CLAS 4852 (1-6) Honors Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sciences Honors Course
Departmental Category: Classical Philology

CLAS 5021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4021 and HIST 4021

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4031 and HIST 4031

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4041 and HIST 4041 and PHIL 4210

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4061 and HIST 4061 and HIST 5061

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence and the selective use of comparisons with better known societies. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4071 and HIST 4071

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republican government. Readings are in the primary sources. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4081 and HIST 4081

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5091 (3) The Roman Empire

Intense survey of Imperial Rome from the Roman revolution to the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the empire. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4091 and HIST 4091

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5109 (3) Ancient Italian Painting

Explores the problems, theories and methods for understanding the iconography, styles, topologies, contexts and techniques of fresco wall painting in ancient Italy from the 6th century B.C.E. to the 4th century C.E. Topics covered include Etruscan tomb paintings, late Republican and early imperial fresco paintings from Rome and Campania and later Roman wall paintings, including the painted images in ancient catacombs. Previous coursework on ancient Italy or the history of pre-modern art is highly recommended.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4109 and ARTH 4109 and ARTH 5109

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5110 (3) Greek and Roman Epic

Students read in English translation the major epics of Graeco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4110 and HUMN 4110

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5119 (3) Roman Sculpture

Examines ancient Roman sculpture, emphasizing the display, iconography, and production of private and public monuments in the Roman Empire. Explores sculpture as evidence for historical developments, societal and gender attitudes, and state ideologies in the ancient Roman world.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4119 and ARTH 4119 and ARTH 5119

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5120 (3) Greek and Roman Tragedy

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4120 and HUMN 4120

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5129 (3) Aegean Art and Archaeology

Detailed study of the cultures of prehistoric Greece, the Cycladic Islands and Crete, their art and archaeology and their history within the broader context of the eastern Mediterranean, from earliest human settlement to the collapse of the Bronze Age at about 1100 B.C.E. Emphasis is on palace states.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4129 and ANTH 4129 and ANTH 5129 and ARTH 4129

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5130 (3) Greek and Roman Comedy

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4130 and HUMN 4130

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5139 (3) Greek Vase Painting

A comprehensive overview of Greek vase painting, from prehistoric through the fourth century B.C.E. Emphasis is on learning the development of primary decorative styles and on refining skills of visual analysis, scholarly research, critical thinking, oral commentary and written presentation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4139 and ARTH 4139 and ARTH 5139

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5140 (3) The Greek and Roman Novel

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4140 and HUMN 4131

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 5149 (3) Greek Cities and Sanctuaries

Examines Greek architecture in context, from the ninth century B.C.E. into the Hellenistic period, considering the use of space, both in religious and in civic settings and using texts as well as material culture. Emphasis is on developing analytical skills.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4149 and ARTH 4149

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5159 (3) Hellenistic Art and Archaeology

Examines art and archaeology from the period following the death of Alexander the Great (late fourth century B.C.E.) to the conquest of Greece by the Romans (middle second century B.C.E.).

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5159

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5169 (3) Topics in Ancient and Classical Art and Archaeology

In-depth consideration of an aspect of ancient Mediterranean culture.

Topics vary and may include ancient wall painting, Greek sculpture, artists and patrons, the ancient Near East, Egyptian art and archaeology, or Etruscan art and archaeology.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4169 and ARTH 4169 and ARTH 5169

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5179 (3) City of Athens

Explores in detail the buildings, sculptures, pots, foreign imports and society of Athens, considering material culture of individuals as much as civic programs. Emphasis is on ways the textual and archaeological evidence complement and/or contradict one another. Focuses on the Periclean period, considering ways in which it developed from earlier times and influenced later ones in Athens.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5179

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5189 (3) City of Rome

Explores in detail the architecture, sculptures, coins, frescoes and other material evidence alongside the political and social history of Augustan Rome. Emphasis is on ways in which the textual and archaeological evidence complement and/or contradict one another. Explores the impact of the early imperial period on later Roman phases of urban design and image making in the capital city.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 5189

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5199 (3) Roman Architecture

Examines the designs, functions and construction methods of ancient Roman towns, temples, baths, houses and civic structures, as well as utilitarian structures including roads and aqueducts. Emphasizes Roman architectural forms and spaces as vehicles for political propaganda and empire consolidation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4199 and ARTH 4199

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5209 (6) Classical Archaeological Field Methods

Offers experiential learning in theories and methods of archaeological fieldwork in the western Argolid in Greece. Applies methods for extensive survey, stratigraphic excavation, GIS modeling, ceramic analysis, numismatic analysis, architectural studies, artifact and data processing and documentation. Offered abroad only.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4209 and ARTH 4209

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CLAS 1509 or ARTH 1509 or CLAS 2049 or ARTH 2049.

Additional Information: Departmental Category: Art and Archaeology

CLAS 5229 (3) Ancient Egyptian Art and Archaeology

Archaeology of ancient Egypt in light of recent excavations; the history of excavations of the different sites; and the art of ancient Egypt through time. Formerly ANTH 5420.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4229 and ARTH 4229 and ARTH 5229

Additional Information: Departmental Category: Art and Archaeology

CLAS 5269 (3) Art and Archaeology of the Ancient Near East

Examines civilizations of the Iran-Iraq region from the rise of urbanism in Mesopotamia through the era of the first 'world empire,' Achaemenid Persia. Emphasizes the material record of religious and state institutions of the ancient Near East, especially monuments that illustrate concepts of kingship. Explores notions of style, symbolism, visual rhetoric, text-image synthesis, patronage, creativity and roles of artists.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4269 and CLAS 4269 and ARTH 5269

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology
Departmental Category: Asia Content

CLAS 5761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4761 and HIST 4761 and HIST 5761

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 5840 (1-3) Graduate Independent Study

No Greek or Latin required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 6109 (3) Topics in Critical Theory and Ancient Art and Archaeology

Topics will vary and may focus on a particular approach to ancient material culture or on a particular time period or artifact category. Emphasis is placed on reading and using theory in considering the ancient world.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 6119 (1-3) Graduate Independent Study in Classical Art and Archaeology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 6952 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Classical Philology

CLAS 7011 (3) Seminar in Ancient History

Examines topics in ancient Greek and Roman history at an advanced seminar level.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Ancient History

CLAS 7012 (3) Graduate Seminar

Topic specified in online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Classical Philology

CLAS 7109 (3) Graduate Seminar in Ancient and Classical Art and Archaeology

Topics vary. Emphasis is on gaining expertise in using archaeological reports in tandem with (or contradiction to) textual sources, on reading and using critical theory, on improving analytical skills and discussion, and on honing discussion leadership abilities.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Art and Archaeology

CLAS 7840 (1-3) Graduate Independent Study

No Greek or Latin required.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Literature, Culture, and Thought

CLAS 8992 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Additional Information: Departmental Category: Classical Philology

College of Engineering and Applied Science Admin (COEN)

Courses

COEN 1236 (1) Precalculus Work Group

Develops and enhances problem solving skills for students enrolled in APPM 1235. Course is conducted in a collaborative learning environment with students working in groups under the guide of a facilitator.

Requisites: Requires enrollment in corequisite course of APPM 1235.

Grading Basis: Pass/Fail

COEN 1350 (1) Calculus 1 Work Group

Provides problem-solving assistance to students enrolled in APPM 1350. Student groups work in collaborative learning environment. Student participation is essential.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires enrollment in corequisite course of APPM 1350 or APPM 1345.

Grading Basis: Pass/Fail

COEN 1360 (1) Calculus 2 Work Group

Provides problem solving assistance for students enrolled in APPM 1360. Conducted in a collaborative learning environment. Student work groups solve calculus problems with assistance of facilitator.

Requisites: Requires enrollment in corequisite course of APPM 1360.

Grading Basis: Pass/Fail

COEN 1400 (3) Project Design

Teams of first-year students solve real engineering design problems. Curriculum focuses on iterative design process, teamwork and team dynamics, supporting design with testing and analysis and technical writing.

Requisites: Restricted to students with 0-75 units completed and restricted to Pre-Engineering (PREN-COS) students only.

COEN 1500 (1) Introduction to Engineering

Provides an introduction to the engineering profession, including an examination of current discipline specializations and a focus on career paths for those trained in engineering. Provides sufficient knowledge of the engineering disciplines necessary to make an informed major choice.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering or Pre-Engineering Arts and Sciences majors only.

COEN 1510 (1) Self Management and Leadership Principles 1

Prepares freshmen in their transition to college. Focuses on academic success strategies, time and stress management, study skills, and S.M.A.R.T. goal setting. Students identify their strengths and participate in peer-to-peer interaction to foster collaboration and positive behavior. Leadership capabilities, professional development, and insights into career interests are explored. Speakers provide students with unique insights into being successful students and engineers.

Requisites: Restricted to Engineering Goldshirt (PENG) students only.

COEN 1520 (1) Self Management and Leadership Principles 2

Continuation of COEN 1510. Self-management and student development is reiterated. Includes time and stress management, study skills and S.M.A.R.T. goal setting for the "master" student. Leadership explored through group projects. Students complete professional development activities and assignments geared toward preparing students for engineering internships and research opportunities. Advising on different engineering department provided to support major selection and course scheduling.

Requisites: Requires prerequisite course of COEN 1510 (minimum grade C-). Restricted to Engineering Goldshirt (PENG) students only.

COEN 1550 (1) YOU'RE@CU: Undergraduate Career Seminar

Exposes first or second year undergraduate students to engineering research careers through a partner program (YOU'RE@CU), panel discussions with researchers in academics and industry, and exposure to research labs. Restricted to YOU'RE@CU participants. Department consent required.

Grading Basis: Pass/Fail

COEN 2050 (3) Engineering Leadership Gateway

Examines concepts of engineering leadership and the essential skills required to become an effective leader. Together students will explore leadership principles, creative and critical thinking, interpersonal skills (e.g. collaboration, conflict resolution, leading in diverse communities), intrapersonal development (e.g. self-appraisal, reflective practice, personal leadership philosophy), organizational competencies (e.g. planning, sustainability, climate), effective communication and ethical decision-making. Fulfills Engineering humanities/social science requirements.

Requisites: Restricted to Engineering Leadership Program (PENL) students only.

COEN 2350 (1) Calculus 3 Work Group

Provides problem solving assistance to students enrolled in APPM 2350. Conducted in a collaborative learning environment. Student work groups solve calculus problems with the assistance of a facilitator.

Requisites: Requires enrollment in corequisite course of APPM 2350.

Grading Basis: Pass/Fail

COEN 2500 (1) Industry 101: Technical Career and Professional Development

Connects students to the world of technical work, helping them gain an understanding of themselves and develop a unique, professional identity. Knowledge will be gained about how to research various industries and how to make an informed decision about career paths. Structured lessons will be incorporated that will cover resumes, interview preparation, communication skills, proper professional etiquette and employer expectations, self-exploration and connections with industries.

Grading Basis: Letter Grade

COEN 2830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 2850 (1-3) Independent Study

Provides opportunities for independent study at the lower-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 3050 (3) Complex Leadership Challenges

Approaches leadership as a process of inquiry, empathy, and action, cultivating skills leaders need to understand, communicate about, and generate innovative approaches to complex issues. Each student conducts extensive, principled research about a complex social issue of their choice, investigating its multidimensionality by applying different analytic lenses. Instructor consent required for students not in Engineering Leadership.

Requisites: Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3051 (1) Leadership Seminar 1: Launching the Leadership Experience

Practicing needs assessment, decision-making and planning skills, students take this seminar to prepare for their Leadership Experience (required for completion of the Engineering Leadership Certificate). Students work in collaboration with each other, their Engineering Leadership Program mentors and campus/community organizations and leaders to lay the foundation for and launch their individually unique Leadership Experiences.

Requisites: Requires a prerequisite course of COEN 2050 (minimum grade C-). Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3052 (1) Leadership Seminar 2: Leadership Experience

Tackling a leadership experience of their own design, students undertake a key component of the Engineering Leadership Program experience and a requirement for the completion of the Engineering Leadership Certificate. Guides students through a process of planning, executing and evaluating their leadership experience and progress toward personalized leadership development goals. Coursework involves working with a mentor, collaborating with peers and conducting research.

Requisites: Requires a prerequisite course of COEN 2050 (minimum grade D-). Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3053 (1) Leadership Seminar 3: ELP Synthesis and Final ePortfolio

Progressing through this course, students complete the ePortfolio that demonstrates fulfillment of the requirements of the Engineering Leadership Certificate, reflecting upon synthesizing and discerning practical applications of the leadership experiences tackled throughout throughout their time at CU.

Requisites: Restricted to Engineering Leadership Program (PENL) students only.

Grading Basis: Letter Grade

COEN 3930 (6) Engineering Co-op

Students enrolled in this course participate in a previously arranged, department-sponsored cooperative education program with a university, government agency, or industry. Offered only through Continuing Education. 00 GPA or higher.

Repeatable: Repeatable for up to 24.00 total credit hours.

Requisites: At least a 2.75 cumulative GPA is required. Restricted to College of Engineering majors only.

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

COEN 4830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 4850 (1-3) Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Subject and/or project agreed upon by the student and the instructor to fit the needs of the student.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

COEN 4950 (1-6) Global Engineering Internship

Gives students the opportunity to pursue studies in engineering-related work experience projects abroad that allow them to explore the relationship between theory and practice in their major. Internships generally require 40 hours on the job per credit hour and evidence of significant learning (e.g., paper, final project and employer evaluations). Does not count toward degree requirements.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

College of Media, Communication, & Information (CMCI)

Courses

CMCI 1000 (1-3) Special Introductory Topics in CMCI

Investigates special introductory topics in media, communication and information.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

CMCI 1010 (4) Concepts and Creativity 1: Media, Communication, Information

Engages key principles and practices in the fields of media, communication and information. Emphasizes the analyses of new and old media, information technologies, verbal and visual literacies, communicative interactions and cultural practices through process-based learning and hands-on projects utilizing multiple modes of expression. Two semester sequence required for all CMCI students; 4 credit hours each semester.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

CMCI 1020 (4) Concepts and Creativity 2: Media, Communication, Information

Engages key principles and practices in the fields of media, communication and information. Emphasizes the analyses of new and old media, information technologies, verbal and visual literacies, communicative interactions and cultural practices through process-based learning and hands-on projects utilizing multiple modes of expression. Two semester sequence required for all CMCI students; 4 credit hours each semester.

Requisites: Requires prerequisite course of CMCI 1010 (minimum grade C-). Restricted to College of Media, Communication, and Information (CMCI) undergraduate students only.

CMCI 1030 (4) CMCI: Concepts and Culture

Engages key principles and practices in the fields of media, communication and information. Emphasizes the analyses of new and old media, information technologies, verbal and visual literacies, communicative interactions and cultural practices through process-based learning and hands-on projects utilizing multiple modes of expression. Accelerated, one-semester version of the introductory CMCI course for transfer students to CMCI.

Grading Basis: Letter Grade

CMCI 3000 (1-3) Special Topics in CMCI

Investigates special topics in media, communication and information at the upper-division level.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

CMCI 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

CMCI 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

CMCI 6051 (3) Media Theories

Studies theories and perspectives of mass and networked communication and explores the role of media in society.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

CMCI 6061 (3) Media Research

Introduces concepts, theoretical approaches and research methods of media research. Students apply these frameworks in research on mediated communication. Covers qualitative and quantitative methods of gathering and analyzing data.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

CMCI 6311 (3) Freedom of Expression

Studies free-speech issues in the context of current and historical philosophical foundations for freedom of expression.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

CMCI 6331 (3) Political Communication

Explores the relationships involving media and politics. Incorporates normative and empirical perspectives on the media-politics complex. Areas covered include media effects on public opinion and policy, uses of media in governance, journalism sociology, coverage of elections, and implications of interactive media for governance and civic participation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

CMCI 6661 (3) Media Ethics and Responsibility

Develops a theoretical framework with which to recognize and analyze ethical issues as they arise in the media.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

CMCI 6861 (3) Visual Communication

Visual communication involves understanding both perception of messages and construction of them. Students analyze their visual thinking abilities and develop habits of visual analysis and criticism, as well as visual communication skills.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

CMCI 6871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMCI 7841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMCI 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMCI 8991 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to graduate students only.

Communication (COMM)

Courses

COMM 1210 (3) Perspectives on Human Communication

Surveys communication in a variety of contexts and applications.

Topics include basic concepts and general models of communication, ethics, language and nonverbal communication, personal relationships, group decision making, organizational communication, and impact of technological developments on communication. Required for COMM majors.

Additional Information: Arts Sci Core Curr: Contemporary Societies
MAPS Course: Social Science

COMM 1300 (3) Public Speaking

Covers theory and skills of speaking in various public settings. Examines fundamental principles from rhetorical and communication theory and applies them to oral presentations. Required for COMM or COMN majors.

COMM 1600 (3) Group Interaction

Covers basic theories, concepts, and characteristics that underlie face-to-face interactions in interpersonal, small group, and organizational settings. Activities stress the development of both task and relational skills in these settings. Required for COMM or COMN majors.

COMM 2000 (3) Topics in Communication

Investigates select topics in communication. Does not count toward the 2000-level courses required for the major, unless explicitly stated in the course schedule.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 2360 (3) Campaigns and Revolutions

Introduces concepts in rhetoric and argumentation that are used to explain significant social and political changes in our society. The goal is to show how social actors use rhetoric to promote some social goals and hinder others.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 2400 (3) Discourse, Culture and Identities

Examines how aspects of talk (e.g., turn-taking, speech acts, narratives, dialect, and stance indicators) link with identities (e.g., ethnic and racial, age, gender, work-related, and personal). Considers how communication is central to constructing who people are and examines social controversies related to talk and identities.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

COMM 2500 (3) Interpersonal Communication

Focuses on basic processes in face-to-face interaction, including verbal and nonverbal messages, coordination in conversation, messages about self and others, and communication in personal relationships. Emphasizes theory and concepts rather than skills.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 2600 (3) Organizational Communication

Provides a communicatively based definition of formal organization and deals with individual-organizational relationships. Addresses topics such as organizational theory, organizational culture, power, technology, decision making, teamwork, leadership, diversity, gender, socialization, and ethics.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3000 (3) Issues in Communication

Explores select issues in communication.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3210 (3) Human Communication Theory

Acquaints students with general, thematic, and contextual theories of human communication. Gives attention to criteria for evaluating theories.

Requisites: Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

COMM 3300 (3) Rhetorical Foundations of Communication

Provides the rhetorical foundations of communication through study of the humanistic traditions of rhetorical theory, with applications to social interaction and message analysis.

Requisites: Requires prerequisite courses of COMM 1210 and COMM 1600 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

COMM 3310 (3) Principles and Practices of Argumentation

Focuses on principles of argument, the process of critical decision making, and uses and limitations of logic and evidence. Contemporary issues (personal, social, political, or philosophical) are analyzed and debated.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3320 (3) Persuasion in Society

Explores how persuasion influences decision making. Focuses on different definitions and models of persuasion, ethical perspectives on persuasion, qualitative and quantitative research on persuasion, and the tools of motivation, as well as how to create effective and ethical persuasive messages.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3340 (3) Political Communication

Provides an overview of the role of communication in contemporary political life. Topics include political communication theories, political campaign communication, media and political communication, and the role of political communication in promoting democracy and public policy.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3370 (3) Environmental Communication

Introduces the growing field of environmental communication, including historical events, key concepts, legal landmarks, technological developments and public controversies at the intersection of the environment, economics and social justice. Focuses on persuasive communication in the public sphere, as well as the constitutive power of communication to name and redefine what has been and might become possible in our environmental imaginations.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

COMM 3410 (3) Intercultural Communication

Explores complex relationships between culture and communication processes from various conceptual perspectives, such as social, psychological, interpretive, and critical. Considers the important role of context (e.g., social, historical, and cultural) in intercultural interactions.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

Additional Information: Arts Sci Core Curr: Human Diversity

COMM 3420 (3) Gender and Communication

Examines gender as a social practice that remains vital to identities, relationships, and institutions in contemporary society. Treats gender as something we do or enact through communication, rather than as something we are or have, and explores the implications of this shift in perspective. Investigates how gender interacts with sexuality, race, class, nation, age, ability, and other aspects of identity.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

COMM 3510 (3) Family Communication

Explores communication in families from various theoretical perspectives, such as social constructionism, systems theory, and dialectical theory. Communication patterns and processes created and sustained by family members are examined, including rules, roles, stories, rituals, myths, metaphors, themes, and cycles.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3610 (3) Communication, Technology, and Society

Presents theory, research, and exploration into computer-based technologies; studies implications for communication, interaction, and social relationships.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3700 (3) Communication and Conflict Management

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

Equivalent - Duplicate Degree Credit Not Granted: PACS 3700

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

COMM 3740 (3) Qualitative Communication Research Methods

Provides an understanding of methods associated with the study of communication in natural settings. Focuses on strategies of collecting, analyzing, and reporting qualitative data, including participant observation, in-depth interviewing, textual analysis, and ethnographic narrative.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3750 (3) Quantitative Research Methods

Introduces empirically oriented research methods in communication, critical review of the logic of social-scientific principles in communication, and analysis of quantitative data.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

Recommended: Prerequisites COMM 1210 and COMM 1600.

COMM 3760 (3) Rhetorical Criticism

Applies key concepts from rhetorical theory to the analysis of specific speeches, written texts, and social situations within the humanistic tradition. Students read a variety of types of criticism and are encouraged to develop their own strategies for critical analysis.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors or minors only.

Recommended: Prerequisites COMM 1210 and COMM 1600 and COMM 3300.

COMM 4000 (1-6) Advanced Topics in Communication

Analyzes special interest areas of communication theory, research, and practice. Course format involves lecture, discussion, investigative analysis, and practical application. May be repeated twice for credit on different topics.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites COMM 3210 and COMM 3300.

COMM 4100 (3) Seminar in Honors Thesis Writing and Research

Provides the opportunity for students writing an honors thesis to develop their understanding of the research process and to improve their research and writing skills.

Requisites: Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

Additional Information: Arts Sciences Honors Course

COMM 4220 (3) Senior Seminar: Functions of Communication

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

Equivalent - Duplicate Degree Credit Not Granted: COMM 5220

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4300 (3) Senior Seminar: Rhetoric

Reviews current theory and research on topics such as rhetoric and publics, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

Equivalent - Duplicate Degree Credit Not Granted: COMM 5300

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3300 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4510 (3) Senior Seminar: Interpersonal Communication

Reviews current theory and research on topics such as strategic interaction, relationship formation and maintenance, and identity and self-presentation. May be taken twice for credit on different topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4600 (3) Senior Seminar: Organizational Communication

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

Equivalent - Duplicate Degree Credit Not Granted: COMM 5600

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4610 (3) Communication Studies of Science and Technology

Reviews current theory and research associated with science, technology, and medicine. Topics include new communication technologies in organizations and society, discourses of scientific theory and science policy, and interaction in clinical setting. May be taken twice for credit on different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of COMM 3210 (minimum grade C-). Restricted to students with 80-180 credits (Senior) Communication (COMM or COMN) majors only.

COMM 4840 (1-6) Undergraduate Independent Study

Note that the 14-hour limit in the major applies to any combination of independent study and internship credit. This course does not count toward the 33 credit hours required for the major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only.

Recommended: Prerequisites COMM 3210 and COMM 3300.

COMM 4930 (1-6) Internship

Studies are pursued in communication-related work experience projects that generally require 40 hours on the job per credit hour and evidence (e.g., journal, paper and employer evaluation) of significant learning. The 14-hour limit in the major applies to any combination of independent study and internship credit and does not count toward the 33 hours required for the major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Communication (COMM or COMN) majors only.

Recommended: Prerequisite 57 hours of overall course work, 18 hours of communication course work completed, 2.50 overall GPA and a faculty sponsor.

Grading Basis: Pass/Fail

COMM 4950 (1-6) Senior Thesis: Honors

For exceptional communication majors who wish to graduate with department honors and receive credit for writing an honors thesis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite COMM 4100 and overall GPA of 3.35 or higher and a COMM or COMN GPA of 3.50 or higher.

Additional Information: Arts Sciences Honors Course

COMM 5210 (3) Readings in Communication Theory

Critical overview of leading theoretical traditions in communication studies. Gives attention to metatheoretical issues, including epistemological foundations, the structure of communication theory as a field, and reflexivity between communication theory and cultural practice. Required for doctoral students in communication; optional for master's students.

Requisites: Restricted to graduate students only.

COMM 5220 (3) Seminar: Functions of Communication

Topical seminar on the functions of communication across interpersonal, group, organizational, and public contexts. Reviews current theory and research on topics such as communication and conflict, persuasion, and ethical dimensions of communication practices.

Equivalent - Duplicate Degree Credit Not Granted: COMM 4220

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 5225 (3) Environmental Communication

Investigates key concepts in environmental communication and considers which theoretical frameworks and practical actions can inform the effects of various constituents to address environmental issues.

COMM 5230 (3) Applied Communication

Examines the study of applications of communication concepts, theories, methods, interventions, and other practices to address real-world issues and problems. Discusses conceptual issues framing applied communication, examines purposes and methods informing such scholarship, and provides opportunity to evaluate and propose research.

Requisites: Restricted to graduate students only.

COMM 5300 (3) Seminar: Rhetoric

Reviews current theory and research on topics such as rhetoric and publics, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

Equivalent - Duplicate Degree Credit Not Granted: COMM 4300

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 5310 (3) Contemporary Rhetorical Criticism

Advanced critical analysis of rhetorical texts in terms of how they shape issues and appeals for judgment, create identities for speakers and their audiences, and construct perceptions of time, space, and the human condition.

Requisites: Restricted to graduate students only.

COMM 5320 (3) Readings in Rhetoric

Survey of classical and contemporary readings in rhetoric. Required for doctoral students in communication; optional for master's students.

Requisites: Restricted to graduate students only.

COMM 5425 (3) Readings in Discourse and Social Practices

Examines the way communicators' discourse expressions (language, talk, interactional devices, semiotic practices, written texts) reflect and construct interpersonal exchanges, societal activities, and institutional scenes, as well as how discourse expression varies across different speech communities.

Requisites: Restricted to graduate students only.

COMM 5435 (3) Readings in Community and Social Interaction

Focuses on how everyday communication practices shape and are shaped by community contexts. Contains theoretical and empirical readings that illustrate how interactions among group members negotiate and maintain distinct communities and how group communication practices reflect shared norms among community members. Also reviews methods to study everyday interactions among community members (e.g., discourse analysis, qualitative coding, surveys and applied approaches/methods).

Grading Basis: Letter Grade

COMM 5600 (3) Seminar: Organizational Communication

Reviews current theory and research on topics such as communication and organizational decision making, organizational culture, gender relations, communication technology, and power and control in organizations.

Equivalent - Duplicate Degree Credit Not Granted: COMM 4600

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 5610 (3) Organizational Culture and Symbolism

Focuses on relationship between ideological elements (e.g., norms, values, and beliefs) and symbolic practices (e.g., metaphor, ritual, and storytelling) of organizational culture. Analyzes topics from viewpoints of academic theory and managerial practice. Reviews interpretive methods of researching workplace culture and symbolism.

Requisites: Restricted to graduate students only.

COMM 5620 (3) Readings in Organizational Communication

Survey of historical and contemporary readings in organizational communication. Treats theory, research, and application from a variety of perspectives.

Requisites: Restricted to graduate students only.

COMM 5720 (3) Readings in Communication and Technology

Survey of multidisciplinary research that examines various relationships between communication and technology. Students are encouraged to develop critical skills in perceiving assumptions and perspectives that motivate major theories in this area, and to examine how these phenomena have changed over time.

Requisites: Restricted to graduate students only.

COMM 5930 (1-6) Graduate Internship

Offers opportunities for graduate-level communication related work projects. Limited to 3 hours in spring and fall semesters, 6 hours in summer. The 6-hour limit at MA level and 9-hour limit at PhD level applies to any combination of independent study and internship credit.

Repeatable: Repeatable for up to 9.00 total credit hours.

COMM 6010 (3) Communication Research and Theory

Provides an introduction to graduate study of communication, offering an overview of the discipline and its scholarship. Required for MA and Ph.D. communication students.

Requisites: Restricted to Communication (COMM or COMN) graduate students only.

COMM 6020 (3) Quantitative Research Methods

Introduces students to the practice of quantitative research in communication: conceptualization and critique of research projects, measurements, methods (e.g., experimental and survey), statistical data analysis, and written reports.

Requisites: Restricted to graduate students only.

COMM 6030 (3) Qualitative Research Methods

Introduction to the epistemology, methodology, and representational practices associated with qualitative communication research. Fieldwork methods emphasized include participant observation, interviewing, and document/artifact analysis.

Requisites: Restricted to graduate students only.

COMM 6200 (3) Seminar: Selected Topics

Facilitates understanding of current and past theory and research on a selected topic in communication and the ability to develop new theory and research on that topic.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 6310 (3) Advanced Rhetorical Criticism

Reviews current critical methods and issues related to rhetorical criticism and rhetorical field methods.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites COMM 5310 and COMM 5320.

COMM 6320 (3) Rhetorical Theory

Reviews current theory and research on topics such as contemporary rhetorical theory, rhetoric and public life, rhetoric as an interpretive social science, and rhetoric of social movements and political campaigns.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6330 (3) Rhetoric of Inquiry

Surveys foundational texts and contemporary research in the rhetoric of inquiry. Focuses on the role of persuasion in the production of knowledge. Critical analysis of major theoretical and methodological traditions and topics, with an emphasis on social dimensions of inquiry.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6340 (3) Rhetoric and Civic Community

Considers performances of public life as rhetorical inducements of civitas. Topics include negotiation of self-regulation among interdependent partners, rhetorical exclusions and/or counterpublics, and dialectical tensions of public/private as these contribute to and have civic consequences for publicness, community, and social will.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6350 (3) Seminar in Argumentation

Surveys foundational texts and contemporary research in argumentation. Analysis of distinctions between philosophical and rhetorical approaches to argument. Critical analysis of major theoretical and methodological traditions and topics with an emphasis on social dimensions of argument.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6360 (3) Social and Cultural Theory

Traces select traditions in social and/or cultural theory, emphasizing how those traditions affect and are affected by the field of rhetoric studies.

Examines the origins and resolutions of major debates in social and/or cultural theory from a rhetorical perspective.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5320.

COMM 6410 (3) Discourse Analysis

Acquaints students with the main types of discourse analysis: conversation analysis, critical discourse analysis, and rhetorically informed discourse approaches. Teaches how to conduct discourse analysis, including transcribing, selecting excerpts, documenting inferences, and linking findings to scholarly controversies.

Requisites: Restricted to graduate students only.

COMM 6420 (3) Interaction Analysis

Educates students in one of a selected set of methodological specializations used in the study of human interaction.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

COMM 6440 (3) Grounded Practical Theory

Examines theory, method, and application of grounded practical theory, an approach to building normative theory through description, critique, and theoretical reconstruction of situated communicative practices. Semester project involves analysis of a sample of discourse from a public or field observation setting.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5210.

COMM 6445 (3) Language, Ideology and Identity

Focuses on cultural foundations of social interaction, with a special emphasis on ideology (including potentially contested cultural norms, values and premises) as a basic condition of meaningful interaction. Identities are discussed as culturally variable, historically embedded interactional accomplishments, constructed from communicative resources such as language and other types of signs, that serve the purpose of participation in communal life.

Requisites: Restricted to graduate students only.

COMM 6470 (3) Public Deliberation and Dialogue

Explores the theory, research and practices of deliberative democracy and dialogue. Considers "ideal" communicative conduct and common interactional troubles, cross-cultural differences and routine communication practices.

Requisites: Restricted to graduate students only.

COMM 6730 (3) Collaboration and Decision Making in Organizations

Explores theory and research on communication processes associated with collaboration and decision making in contemporary organizations, particularly as they are influenced by participation programs, technology, and team structures.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites COMM 5620 and COMM 6010.

COMM 6740 (3) Theory and Philosophy of Organizing and Organizations

Reviews theory and philosophy of organizations and organizing where communication processes are seen as constitutive. Focuses on discursive and material practices in the formation and change of organizational structure, culture, and operation.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5620.

COMM 6750 (3) Communication and Organizational Change

Addresses the role of communication in cultural change efforts in organizations. Topics include the nature and function of organizational cultures, role of leadership, ethical issues, and member involvement in change processes. Specific organizational cases are highlighted throughout.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite COMM 5620.

COMM 6780 (3) Roles, Relationships, and Identities in Interaction

Examines how social roles influence communicative practices, the development of relationships, and the impact of relationships on identity. Considers these processes in contexts, such as personal relationships and institutional settings. Topic varies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

COMM 6840 (1-3) Master's Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

COMM 6940 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 3.00 total credit hours.

Grading Basis: Pass/Fail

COMM 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

COMM 8840 (1-6) Doctoral Independent Study

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

COMM 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Communication Residential Academic Program (COMR)

Courses

COMR 1000 (1-2) Communication and Community

Introduction to how communication builds community by creating and sharing meaning. Examination of communication practices at the interpersonal level (friends and family), the group level (teams, classrooms and organizations) and the societal level (citizenship, social change, mass media).

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to students in the Communication and Society Residential Academic Program (PCMS).

COMR 1800 (3) Visual Literacy: Images and Ideologies

Explores the relationship between visual images and cultural values, including how we process visual information, the evolution of conventions in various media, common visual portrayals, and ethical issues.

Requisites: Restricted to students in the Communication and Society Residential Academic Program (PCMS).

Additional Information: Arts Sci Core Curr: Literature and the Arts

Comparative Literature (COML)

Courses

COML 8990 (1-10) Doctoral Dissertation

Requisites: Restricted to graduate students only.

Computer Science (CSCI)

Courses

CSCI 1000 (1) Computer Science as a Field of Work and Study

Introduces curriculum, learning techniques, time management and career opportunities in Computer Science. Includes presentations from alumni and others with relevant educational and professional experience.

Requisites: Restricted to students with 0-26 credits (Freshmen) Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA or CSCI-ADL) majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 1200 (3) The Art of Computational Thinking and Computer Programming

Teaches computational thinking and techniques for writing computer programs using the Python programming language. Intended for students who realize that obtaining computational skills is beneficial to all fields of study, but who have little or no experience in programming or are not Computer Science majors. Students will be expected to create computer programs to solve problems in a range of disciplines.

Additional Information: Departmental Category: General Computer Science

CSCI 1220 (4) Virtual Worlds: An Introduction to Computer Science

Introduces the fundamental principles of computer science using an on-line virtual world called Second Life as the "Laboratory" for the course. Students will learn how to program by creating objects of interest in Second Life. In-class and in-world discussions and readings will introduce the student to important ideas and concepts that shape the field of computer science.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 1220

Additional Information: Departmental Category: General Computer Science

CSCI 1240 (3) The Computational World

Introduces and explores the "computational style of thinking" and its influence in science, mathematics, engineering and the arts. Does not focus on the nuts and bolts of any particular programming language, but rather on the way in which computing has affected human culture and thought in the past half century.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 1240

Additional Information: Departmental Category: General Computer Science

CSCI 1300 (4) Computer Science 1: Starting Computing

Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains. Intended for students with little to no experience in computing or programming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1310 or CSCI 1320 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 1310 (4) Computer Science 1: Starting Computing - Experienced

Intended for students with some prior experience in programming and basic knowledge of variables, conditionals, and loops. Teaches techniques for writing computer programs in higher level programming languages to solve problems of interest in a range of application domains.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1320 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 1320 (4) Computer Science 1: Starting Computing-Engineering Applications

Intended for students with no prior experience in programming. Class outcomes and goals are identical to CSCI 1300, but uses problems and tools from Engineering. Teaching techniques for writing computer programs in higher level programming languages to solve problems of interest in Engineering and other domains.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1310 or ECEN 1310

Requisites: Requires a prerequisite or corequisite course of MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (all minimum grade C-).

Restricted to College of Engineering or Pre-Engineering Arts and Science (PREN) majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 2270 (4) Computer Science 2: Data Structures

Studies data abstractions (e.g., stacks, queues, lists, trees) and their representation techniques (e.g., linking, arrays). Introduces concepts used in algorithm design and analysis including criteria for selecting data structures to fit their applications.

Requisites: Requires prerequisite courses of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1030 or ECEN 1310 and APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2400 (4) Computer Systems

Covers how programs are represented and executed by modern computers, including low-level machine representations of programs and data, an understanding of how computer components and the memory hierarchy influence performance.

Requisites: Requires prerequisite course of CSCI 2270 and a prerequisite or corequisite course of CSCI 2824 or ECEN 2703 or a prerequisite course of MATH 2001 or APPM 3170 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2820 (3) Linear Algebra with Computer Science Applications

Introduces the fundamentals of linear algebra in the context of computer science applications. Includes vector spaces, matrices, linear systems, and eigenvalues. Includes the basics of floating point computation and numerical linear algebra.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 2824 (3) Discrete Structures

Covers foundational materials for computer science that is often assumed in advanced courses. Topics include set theory, Boolean algebra, functions and relations, graphs, propositional and predicate calculus, proofs, mathematical induction, recurrence relations, combinatorics, discrete probability. Focuses on examples based on diverse applications of computer science.

Requisites: Requires prerequisite courses of CSCI 1200 or CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1030 or ECEN 1310 and APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 2830 (1-3) Special Topics in Computer Science

Covers topics of interest in computer science at the sophomore level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Computer Science

CSCI 2900 (1-3) Lower Division, Undergraduate Level Independent Study

Offers selected topics at the elementary level for students with little or no previous computing experience.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Computer Science

CSCI 3002 (3) HCC Foundations/User-Centered Design and Development 1

Introduces the practice and research of human-centered computing, including the evolution of human-computer interaction to its forms today and the techniques of user-centered design. Surveys topics that include social computing; tangible computing; mobility; and more. It will cover computing in society at large with respect to domains such as health, education, assistive technology, emergency response and environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3010 (3) Programming Project Workshop

A semester-long projects course guided by an instructor to help design and develop a programming project.

Requisites: Requires a prerequisite course of CSCI 2270 (minimum grade C-).

CSCI 3022 (3) Introduction to Data Science Algorithms

Introduces students to the tools methods and theory behind extracting insights from data using computer science algorithms. Covers algorithms that maximize likelihood objective functions; linear prediction algorithms; making decisions based on data assembled from large datasets; discovering and quantifying connections between observations in real-world data such as text and images; representing and manipulating data on a computer.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3100 (1) Software and Society

Provides students with an understanding of the professional, ethical, legal and social issues and responsibilities of software developers, as well as providing them with the ability to analyze the local and global impacts of computing on individuals, organizations and society.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4308 and CSCI 4328 and CSCI 4338 and CSCI 4348

Requisites: Requires prerequisite course of CSCI 3308 (minimum grade C-). Restricted to Computer Science (CSEN-BS, CSEN-ADL, CSCI-BA, CSCI-ADL) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Computer Science

CSCI 3104 (4) Algorithms

Covers advanced data structures, computational geometry, cryptography, dynamic programming, greedy algorithms, divide-and-conquer, graph algorithms (e.g., depth-first search), network algorithms (e.g., shortest paths), approximation algorithms.

Requisites: Requires prerequisite courses of CSCI 2270 and APPM 1360 or MATH 2300 and one of the following: CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 3112 (1-3) Human-Centered Computing Professional Development

Supports students in developing professional skills and practices in human-computer interaction, design of interactive systems, computer supported cooperative work, computer supported collaborative learning, educational technology, tools that support creativity, user-developed knowledge collections and gaming.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 3112

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3155 (4) Principles of Programming Languages

Study fundamental concepts on which programming of languages are based, and execution models supporting them. Topics include values, variables, bindings, type systems, control structures, exceptions, concurrency, and modularity. Learn how to select a language and to adapt to a new language.

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Programming Languages

CSCI 3202 (3) Introduction to Artificial Intelligence

Surveys artificial intelligence techniques of search, knowledge representation and reasoning, probabilistic inference, machine learning, and natural language

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170 and one of the following: APPM 3570, 4570, 4520, CSCI 3022, MATH 3510, 4510, CVEN 3227, ECEN 3810, MCEN 4120 or ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3287 (3) Design and Analysis of Data Systems

Analyzes design of data systems, including data stored in file systems, database management systems and physical data organizations. Studies calculus of data models, query languages, concurrency and data privacy and security.

Requisites: Requires prerequisite course of CSCI 3104 (minimum grade C-).

Additional Information: Departmental Category: Database Systems

CSCI 3302 (3) Introduction to Robotics

Introduces students to fundamental concepts in autonomous, mobile robotics: mechanisms, locomotion, kinematics, control, perception and planning. The course consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3303

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3308 (3) Software Development Methods and Tools

Covers tools and practices for software development with a strong focus on best practices used in industry and professional development, such as agile methodologies, pair-programming and test-driven design. Students develop web services and applications while learning these methods and tools.

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 3434 (3) Theory of Computation

Introduces the foundations of formal language theory, computability, and complexity. Shows relationship between automata and various classes of languages. Addresses the issue of which problems can be solved by computational means, and studies complexity of solutions.

Requisites: Requires prerequisite courses of CSCI 3104 and CSCI 3155 (all minimum grade C-).

Additional Information: Departmental Category: Theory of Computation

CSCI 3656 (3) Numerical Computation

Covers development, computer implementation, and analysis of numerical methods for applied mathematical problems. Topics include floating point arithmetic, numerical solution of linear systems of equations, root finding, numerical interpolation, differentiation, and integration.

Requisites: Requires prerequisite courses of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 1360 or MATH 2300 and MATH 2130 or APPM 2360 or APPM 3310 or CSCI 2820 (all minimum grade C-).

Additional Information: Departmental Category: Numerical Computation

CSCI 3702 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: LING 3005 and PHIL 3310 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 3753 (4) Design and Analysis of Operating Systems

Analyzes the software that extends hardware to provide a computing environment, including the role of linkers, file systems, resource sharing, security and networking. Studies the history of operating system organization and design and their influence on security, functionality and reliability.

Requisites: Requires prerequisite courses of CSCI 2270 and either CSCI 2400 or ECEN 3350 (all minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 3832 (3) Machine Translation

Provides a comprehensive overview of current techniques in statistical machine translation of natural language, e., automatically translating from Spanish to English. Covers language models, reordering, hierarchical translation and evaluating whether a translation is effective.

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or MATH 2001 or ECEN 2703 or APPM 3170 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4229 (3) Computer Graphics

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5229

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Graphics

CSCI 4239 (3) Advanced Computer Graphics

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5239

Requisites: Requires prerequisite course of CSCI 4229 (minimum grade C-).

Additional Information: Departmental Category: Graphics

CSCI 4250 (3) Computer Science: The Canon

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count as CS credit for the Computer Science BA, BS or minor.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5250

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Computer Science

CSCI 4253 (3) Datacenter Scale Computing - Methods, Systems and Techniques

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5253

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite CSCI 4273.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4273 (3) Network Systems

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5273 and ECEN 5273

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4302 (3) Advanced Robotics

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5302

Requisites: Requires prerequisite course of CSCI 3302 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4308 (4) Software Engineering Project 1

Advanced practicum in which students design, implement, document and test software systems for use in industry, non-profits, government and research institutions. Also offers extensive experience in oral and written communication throughout the development process. Department enforced prerequisite: successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 4448.

Additional Information: Departmental Category: Software Engineering

CSCI 4314 (3) Algorithms for Molecular Biology

Surveys molecular biology and combinatorial algorithms used to understand DNA, RNA and proteins. Students work in groups to define and tackle meaningful biological problems and learn to collaborate effectively with scientists in other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5314

Requisites: Requires a prerequisite course of CSCI 3104 (minimum grade C-).

Recommended: Prerequisite comfort with mathematics and/or programming experience, and more advanced understanding (upper undergraduate level) of any relevant discipline.

Additional Information: Departmental Category: Theory of Computation

CSCI 4318 (4) Software Engineering Project 2

Second semester of an advanced practicum in computer science. Students must take this course and CSCI 4308 contiguously as the project spans the entire academic year.

Requisites: Requires prerequisite course of CSCI 4308 (minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 4328 (4) Software Project Management and Mentoring

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing and prototype goals. Study project risk management and cost estimation approaches. Experience mentoring Senior Software Project Team. Intended for professional software developers. Department consent required, see Senior Project Director for permission.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Software Engineering

CSCI 4338 (2) Software Project Management

Review software project management and discuss the latest approaches, methodologies and standards of software development. Learn to develop software quality, documentation, testing, and prototype goals. Study project risk management and cost estimation approaches. Intended for double majors doing interdisciplinary projects in other departments. Department consent required, see Senior Project Director for permission.

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Software Engineering

CSCI 4348 (4) Startup Essentials: Entrepreneurial Projects in Computing

Provide students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept, and be evaluated on product/market fit. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WRTG. Formerly CSCI 4000.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5340

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Computer Science (CSEN) majors or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 4358 (4) Entrepreneurial Projects II

Follows CSCI 4348. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5350

Requisites: Requires a prerequisite course of CSCI 4348 (minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4413 (3) Computer Security and Ethical Hacking

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5413

Requisites: Requires prerequisite course of CSCI 4273 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4446 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5446 and ECEN 4423 and ECEN 5423

Requisites: Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 or ECEN 1310 and APPM 2350 or MATH 2400 (all minimum grade C-).

Recommended: Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

Additional Information: Departmental Category: Numerical Computation

CSCI 4448 (3) Object-Oriented Analysis and Design

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5448

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 3308 (all minimum grade C-).

Additional Information: Departmental Category: Software Engineering

CSCI 4502 (3) Data Mining

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5502

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4555 (3) Compiler Construction

Introduces the basic techniques used in translating programming languages: scanning, parsing, definition table management, operator identification and coercion, code selection and register allocation, error recovery. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5525 and ECEN 4553 and ECEN 5523

Requisites: Requires prerequisite courses of CSCI 3155 and CSCI 2400 or ECEN 3350 (all minimum grade C-).

Additional Information: Departmental Category: Programming Languages

CSCI 4576 (4) High-Performance Scientific Computing

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5576

Recommended: Prerequisite CSCI 3656.

Additional Information: Departmental Category: Numerical Computation

CSCI 4586 (4) High-Performance Scientific Computing 2

Introduces computing systems, software, and methods to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. Second course in a two-semester sequence.

Requisites: Requires prerequisite course of CSCI 4576 (minimum grade C-).

Additional Information: Departmental Category: Numerical Computation

CSCI 4593 (3) Computer Organization

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4593

Requisites: Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-).

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4753 (3) Computer Performance Modeling

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5753 and ECEN 4753 and ECEN 5753

Requisites: Requires prerequisite course of CSCI 3753 and MATH 2300 or APPM 1360 (all minimum grade C-).

Recommended: Requisite a course in statistics.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 4802 (1) Data Science Team Companion Course

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5802

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of APPM 3310 or APPM 3570 or APPM 4520 or APPM 4570 or MATH 2130 or MATH 3510 or MATH 4510 or CSCI 2820 or CSCI 3022 or CVEN 3227 or ECEN 3810 or MCEN 4120 (minimum grade C-).

Additional Information: Departmental Category: Artificial Intelligence

CSCI 4809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5809 and ATLS 4809 and ATLS 5809

Additional Information: Departmental Category: Graphics

CSCI 4810 (1) Seminar in Computational Biology

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6810

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Computer Science

CSCI 4830 (1-3) Special Topics in Computer Science

Covers topics of interest in computer science at the senior undergraduate level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 2400 or ECEN 3350 (minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4831 (1-3) Special Topics in Algorithms

Covers topics of interest in computer science at the upper-division undergraduate level. Content varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of CSCI 3104 and CSCI 2820 or MATH 2130 or APPM 3310 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4900 (1-3) Upper Division, Undergraduate Level Independent Study

Provides opportunities for independent study at the upper-division undergraduate level. Students work on a small research problem or tutor lower-division computer science students.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C-).

Additional Information: Departmental Category: General Computer Science

CSCI 4950 (2-4) Senior Thesis

Provides an opportunity for senior computer science majors to conduct exploratory research in computer science. Department enforced restriction, successful completion of a minimum of 36 credit hours of Computer Science coursework and approved WR TG.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of CSCI 3100 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: General Computer Science

CSCI 4960 (2-4) Computer Science Honors Thesis

Provides an opportunity for senior Computer Science majors to complete an honors thesis by conducting exploratory research in computer science. Department enforced prerequisites: successful completion of a minimum of 36 credit hours of Computer Science foundation and Computer Science electives and a writing requirement.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Computer Science

CSCI 5135 (3) Computer-Aided Verification

Covers two-level and multilevel minimization, optimization via expert systems, algebraic and Boolean decomposition, layout methodologies, state assignment, encoding and minimization, silicon compilation.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5139

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites ECEN 2703 and general proficiency in discrete mathematics and programming.

Additional Information: Departmental Category: Programming Languages

CSCI 5229 (3) Computer Graphics

Studies design, analysis and implementation of computer graphics techniques. Topics include interactive techniques, 2D and 3D viewing, clipping, segmentation, translation, rotation and projection. Involves removal of hidden edges, shading and color. Knowledge of basic linear algebra is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4229

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5239 (3) Advanced Computer Graphics

Studies design, analysis and implementation of advanced computer graphics techniques. Topics include shaders, using the GPU for high performance computing, graphics programming on embedded devices such as mobile phones; advanced graphics techniques such as ray tracing.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4239

Requisites: Requires prerequisite course of CSCI 5229 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5250 (3) Computer Science: The Canon

Explores the "great works" of computer science through intensive reading and discussion. Readings include works by Babbage, Turing, Von Neumann, Goedel, Shannon and Minsky, among others. Does not count toward breadth requirement for Computer Science MS/ME degree.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4250

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5253 (3) Datacenter Scale Computing - Methods, Systems and Techniques

Covers the primary problem solving strategies, methods and tools needed for data-intensive programs using large collections of computers typically called "warehouse scale" or "data-center scale" computers. Examines methods and algorithms for processing data-intensive applications, methods for deploying and managing large collections of computers in an on-demand infrastructure and issues of large-scale computer system design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4253

Requisites: Restricted to graduate student Computer Sciences (CSEN) students only.

Recommended: Prerequisite CSCI 5273.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5254 (3) Convex Optimization and Its Applications

Discuss basic convex analysis (convex sets, functions and optimization problems), optimization theory (linear, quadratic, semidefinite and geometric programming; optimality conditions and duality theory), some optimization algorithms (descent methods and interior-point methods), basic applications (in signal processing, control, communications, networks, statistics, machine learning, circuit design and mechanical engineering, etc.), and some advanced topics (distributed decomposition, exact convex relaxation, parsimonious recovery).

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5273 (3) Network Systems

Focuses on design and implementation of network programs and systems, including topics in network protocols, file transfer, client-server computing, remote procedure call and other contemporary network system design and programming techniques. Familiarity with C and Unix is required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4273 and ECEN 5273

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5302 (3) Advanced Robotics

Exposes students to current research topics in the field of robotics and provides hands-on experience in solving a grand challenge program.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4302

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 3302 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5314 (3) Algorithms for Molecular Biology

Surveys molecular biology and combinatorial algorithms used to understand DNA, RNA, and proteins. Students work in groups to define and tackle meaningful biological problems and learn to collaborate effectively with scientists in other disciplines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4314

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5340 (3) Startup Essentials: Entrepreneurial Projects in Computing

Provides students with the tools to be successful technical co-founders of their own startups. Explores the initial stages of founding a startup, including team formation, idea validation, pivoting and pitching, while employing an iterative methodology. Student teams will develop a minimum viable product, pitch their final startup concept and be evaluated on product/market fit. CS coding concepts relevant for startups, including potentially cloud programming, mobile programming and agile software engineering, will be taught. Does not satisfy breadth requirement.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4348

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5350 (3) Entrepreneurial Projects II

Follows CSCI 5340. In the second semester of this entrepreneurial project capstone, student teams will seek to find market traction for a high-fidelity Minimum Viable Product (MVP), software and/or hardware, that they will develop as part of their startup project. Teams will further learn to incorporate principles of marketing, business finance and legal issues into the business model for their startup concept. Does not satisfy breadth requirement.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4358

Requisites: Requires a prerequisite course of CSCI 5340 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5352 (3) Network Analysis and Modeling

Examines modern techniques for analyzing and modeling the structure and dynamics of complex networks. Focuses on statistical algorithms and methods, and emphasizes model interpretability and understanding the processes that generate real data. Applications are drawn from computational biology and computational social science. No biological or social science training is required.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 3104 and APPM 3570.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5413 (3) Computer Security and Ethical Hacking

Teaches basic exploit design and development through hands-on experimentation and testing. Uses a controlled environment to give students a "playground" in which to test penetration skills that are normally not allowed on live networks.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4413

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5417 (3) Information Retrieval Systems

Addresses practical issues in the design, implementation and analysis of modern information retrieval systems. The major focus is on Web-based applications including ad hoc retrieval, classification, and clustering. Introduces the use of open source retrieval systems, standard evaluation metrics and gold-standard evaluation collections.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Database Systems

CSCI 5444 (3) Introduction to Theory of Computation

Reviews regular expressions and finite automata. Studies Turing machines and equivalent models of computation, the Chomsky hierarchy, context-free grammars, push-down automata, and computability.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5446 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4446 and ECEN 4423 and ECEN 5423

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5448 (3) Object-Oriented Analysis and Design

An applied analysis and design class addressing the use of object-oriented techniques. Topics include domain modeling, use cases, architectural design and modeling notations. Students apply the techniques in analysis and design projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4448

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Software Engineering

CSCI 5454 (3) Design and Analysis of Algorithms

Techniques for algorithm design, analysis of correctness and efficiency; divide and conquer, dynamic programming, probabilistic methods, advanced data structures, graph algorithms, etc. Lower bounds, NP-completeness, intractability.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 2270 or equivalent.

Additional Information: Departmental Category: Theory of Computation

CSCI 5502 (3) Data Mining

Introduces basic data mining concepts and techniques for discovering interesting patterns hidden in large-scale data sets, focusing on issues relating to effectiveness and efficiency. Topics covered include data preprocessing, data warehouse, association, classification, clustering, and mining specific data types such as time-series, social networks, multimedia, and Web data.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4502

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5525 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students will build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4555 and ECEN 4553 and ECEN 5523

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 3155 and CSCI 2400 or ECEN 3350.

Additional Information: Departmental Category: Programming Languages

CSCI 5535 (3) Fundamental Concepts of Programming Languages

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5533

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 3155 or instructor consent required.

Additional Information: Departmental Category: Programming Languages

CSCI 5548 (3) Software Engineering of Standalone Programs

Applies engineering principles to phases of software product development, project planning, requirements definition, design, implementation, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections and modeling. Includes relation to RTS and object-oriented programming.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5543

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 1300 and CSCI 2270 or instructor consent required.

Additional Information: Departmental Category: Software Engineering

CSCI 5551 (3) Parallel Processing

Examines a range of topics involved in using parallel operations to improve computational performance. Discusses parallel architectures, parallel algorithms and parallel programming languages. Architectures covered include vector computers, multiprocessors, network computers and data flow machines.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5553

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite background in computer organization, introduction to programming languages, elementary numerical analysis, or instructor consent required.

Additional Information: Departmental Category: Parallel Processing

CSCI 5573 (3) Advanced Operating Systems

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5573

Requisites: Requires prerequisite course of CSCI 2400 and CSCI 3753 (all minimum grade C). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5576 (4) High-Performance Scientific Computing

Introduces computing systems, software and methods used to solve large-scale problems in science and engineering. Students use high-performance workstations and a supercomputer. First course in a two-semester sequence.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4576

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5593 (3) Advanced Computer Architecture

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a machine and the design of cache memory systems. Also studies current and historically important computer architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5593

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 4593 or instructor consent required.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5606 (3) Principles of Numerical Computation

Highlights computer arithmetic, solution of linear systems, least-squares approximations, nonlinear algebraic equations, interpolation, and quadrature.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites CSCI 3656 and three semesters of calculus or equivalent.

Additional Information: Departmental Category: Numerical Computation

CSCI 5608 (3) Software Project Management

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5603 and EMEN 5031

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisites ECEN 4583 and CSCI 5548 and CSCI 4318 or equivalent industrial experience.

Additional Information: Departmental Category: Software Engineering

CSCI 5622 (3) Machine Learning

Trains students to build computer systems that learn from experience. Includes the three main subfields: supervised learning, reinforcement learning and unsupervised learning. Emphasizes practical and theoretical understanding of the most widely used algorithms (neural networks, decision trees, support vector machines, Q-learning). Covers connections to data mining and statistical modeling. A strong foundation in probability, statistics, multivariate calculus, and linear algebra is highly recommended.

Requisites: Requires prerequisite courses of CSCI 2400 and CSCI 3104 (all minimum grade C). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5636 (3) Numerical Solution of Partial Differential Equations

Focuses on parallel algorithms for partial differential equations, iterative solvers such as Krylov subspace methods, domain decomposition and multilevel methods.

Requisites: Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5646 (3) Numerical Linear Algebra

Offers direct and iterative solutions of linear systems. Also covers eigen value and eigenvector calculations, error analysis, and reduction by orthogonal transformation. A sound knowledge of basic linear algebra, experience with numerical computation, and programming experience is required.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5654 (3) Linear Programming

Presents algorithms, simplex and modifications. Examines theory-duality and complementary slackness. Involves network flow algorithms. Introduces integer programming.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite linear algebra.

Additional Information: Departmental Category: Theory of Computation

CSCI 5673 (3) Distributed Systems

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5673

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 5573 or a course in computer networks.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5676 (3) Numerical Optimization

Focuses on computational methods for solution of unconstrained and some constrained optimization problems, nonlinear least-squares problems and systems of nonlinear equations. Formerly CSCI 6676.

Requisites: Requires prerequisite course of CSCI 2820 or CSCI 3656 (minimum grade B). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Numerical Computation

CSCI 5714 (3) Formal Languages

Explores context-free languages: pumping lemma and variants, closure properties, and decision properties. Involves parsing algorithms, including general and special languages, e.g., LR. Additional topics chosen by instructor.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 5444 or instructor consent required.

Additional Information: Departmental Category: Theory of Computation

CSCI 5722 (3) Computer Vision

Explores algorithms that can extract information about the world from images or sequences of images. Topics covered include: imaging models and camera calibration, early vision (filters, edges, texture, stereo, optical flow), mid-level vision (segmentation, tracking), vision-based control and object recognition.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite probability, multivariate calculus and linear algebra.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5753 (3) Computer Performance Modeling

Presents a broad range of system measurement and modeling techniques, emphasizing applications to computer systems. Topics include system measurement, work load characterization and analysis of data; design of experiments; simulation; and queuing theory and queuing network models.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4753 and ECEN 4753 and ECEN 5753

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 5802 (1) Data Science Team Companion Course

Gives students hands-on experience applying data science techniques and machine learning algorithms to real-world problems. Students work in small teams on internal challenges, many of which will be sponsored by local companies and organizations and will represent the university in larger teams for external challenges at the national and global level, such as those hosted by Kaggle. Students will be expected to participate in both internal and external challenges, attend meetings and present short presentations to the group when appropriate. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4802

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5809 (3) Computer Animation

Develops a firm understanding of the general principles of computer animation. Lectures cover the creation of models, materials, textures, surfaces, and lighting. Path and key frame animation, particle dynamics, and rendering are introduced. Students are assigned a number of animation tutorials to carry out.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4809 and ATLS 4809 and ATLS 5809

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5817 (3) Database Systems

Provides an advanced treatment of basic database concepts.

Requisites: Requires prerequisite course of CSCI 3287 (minimum grad C-). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 3753.

Additional Information: Departmental Category: Database Systems

CSCI 5822 (3) Probabilistic Models of Human and Machine Learning

Introduces a set of modeling techniques that have become a mainstay of modern artificial intelligence, cognitive science and machine learning research. These models provide essential tools for interpreting the statistical structure of large data sets and for explaining how intelligent agents analyze the vast amount of experience that accumulates through interactions with an unfamiliar environment.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite undergraduate course in probability and statistics.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5828 (3) Foundations of Software Engineering

Provides an introduction to software engineering concepts and techniques. Topics include the history of software engineering, fundamental software engineering principles and theory, software life cycles, software testing, and the design and implementation of concurrent and large-scale software systems.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Software Engineering

CSCI 5832 (3) Natural Language Processing

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

Equivalent - Duplicate Degree Credit Not Granted: LING 5832

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5839 (3) User-Centered Design and Development 1

Develops the skills and practices necessary to apply user-centered approaches to software requirements analysis, and the design and evaluation of computer applications.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5854 (3) Theoretical Foundations for Cyber-Physical Systems

Covers techniques for modeling, design and verification of Cyber-Physical Systems and application domains including automotive systems, robotics and medical devices. Modeling topics include timed systems, differential equations, switched systems, hybrid dynamical systems. Verification topics: reachability and stability verification. Temporal specifications. Synthesis of controllers. Applications: automotive systems, medical devices.

Requisites: Requires prerequisite course of CSCI 3434 or ECEN 3300 (minimum grade C). Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Theory of Computation

CSCI 5900 (1-6) Master's Level Independent Study

Provides opportunities for independent study at the master's level.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 5919 (3) HCC Survey and Synthesis: Foundations and Trajectories

Examines interdisciplinary field of human-computer interaction through a comprehensive content and historical survey. Considers new trajectories of inquiry and how the field merges with others. "Social computing" is emphasized as a central topic. Students across disciplines will find the course foundational for understanding human-centered technology matters, including computer scientists; social scientists; and business and media arts students.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: Graphics

CSCI 5922 (3) Neural Networks and Deep Learning

Introduces modern approaches to machine learning using neural networks. Neural nets, popular in the early 1990s, have undergone a resurgence due to significant advances in computing power and the availability of very large data sets. Now rechristened 'deep learning', the field has produced state-of-the-art results in a range of artificial intelligence problems, including vision, speech and natural language processing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Artificial Intelligence

CSCI 5929 (3) HCC Survey and Synthesis: New Disciplinary Directions

Studies recent advances in human-computer interaction through critical analysis of influential papers and self-guided research. Examines new paradigms in input, output, and visualization for technology design and interaction. Considers innovative methods to assess various population design and technological needs. Studies in computer-related fields, social science, business, media arts and communications benefit learning about human-centered computing research.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Recommended: Prerequisite CSCI 5919.

Additional Information: Departmental Category: Graphics

CSCI 6000 (1) Introduction to the Computer Science PhD Program

Instructs new Ph.D students in Computer Science how to obtain a Ph.D and how to become an effective member of the computer science research community. Makes students aware of formal requirements, educational objectives, and research themes. Provides evaluative criteria and guidelines for all objectives to be achieved.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

CSCI 6268 (3) Foundations of Computer and Network Security

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5550

Requisites: Requires prerequisite course of CSCI 5273 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Software Engineering

CSCI 6302 (3) Speech Recognition and Synthesis

Introduction to automatic speech recognition and understanding, conversational agents, dialogue systems, and speech synthesis/text-to-speech. Topics include the noisy channel model, Hidden Markov Models, A* and Viterbi decoding, language modeling (N-grams, entropy), concatenative synthesis, text normalization, dialogue and conversation modeling.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 5832 or LING 5200 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 6402 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 6454 (3) Advanced Algorithms

Topics include matching and network flows, matroids, computational geometry, parallel computation (PRAM, hypercube, mesh). Also includes Vlsi, database theory, distributed computation, cryptography, robotics, scheduling, probabilistic algorithms, approximation algorithms, average case, and amortized analysis, time permitting.

Requisites: Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Theory of Computation

CSCI 6622 (3) Advanced Machine Learning

Covers advanced theoretical and practical topics in machine learning and latest developments in the field. Students conduct original research, either applied or theoretical, and present their results.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CSCI 5622 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 6686 (3) Numerical Methods for Constrained Optimization

Covers computational methods for constrained optimization. Topics include basic theory, methods for quadratic programming, active set strategies for linear constraints, and penalty and successive quadratic programming methods for nonlinearly constrained problems.

Requisites: Requires prerequisite course of CSCI 5606 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Numerical Computation

CSCI 6800 (1-6) Master of Engineering Project

Students seeking the master of engineering degree must complete a creative investigation project, including a written report, supervised by a member of the graduate faculty. Department enforced prerequisite: completion of 21 hours towards the ME degree.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate student Computer Sciences (CSEN) students only.

Additional Information: Departmental Category: General Computer Science

CSCI 6810 (1) Seminar in Computational Biology

Provides an overview of current research topics in computational biology and health informatics, with a focus on research conducted on campus. Each week students will attend an on-campus seminar or a presentation by an on-campus research group. Prepares students to participate in a research project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4810

Additional Information: Departmental Category: General Computer Science

CSCI 6940 (1) Master's Degree Candidacy

For students who need to be registered for the purpose of taking the master's comprehensive exam and who are not otherwise registered.

Credit does not count toward degree requirements.

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Computer Science

CSCI 6950 (1-6) Master's Thesis

Requisites: Restricted to Computer Science (CSEN) graduate students or Computer Science Concurrent Degree majors only.

Additional Information: Departmental Category: General Computer Science

CSCI 7000 (1-4) Current Topics in Computer Science

Covers research topics of current interest in computer science that do not fall into a standard subarea.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

CSCI 7123 (3) Topics in Operating Systems

Topics selected by instructor. Possible topics are system design, measurement and evaluation, simulation, mathematical modeling, and parallelism.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 5573 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 7135 (3) Topics in Programming Languages

Topics selected by instructor. Possible topics are syntax, semantics, metacompilers, compiler design, and translator writing systems. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Programming Languages

CSCI 7143 (3) Topics in Computer Systems

Topics selected by instructor. Possible topics are online systems, multiprocessing, microprogramming, architecture, data communications, and computing networks. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Operating Systems and Hardware

CSCI 7154 (3) Topics in Theory of Computation

Selected topics of current interest in theory of computation.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 5454 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Theory of Computation

CSCI 7176 (3) Topics in Numerical Computation

Topics selected by instructor. Possible topics are numerical linear algebra, solution of differential equations, nonlinear algebra and optimization, data fitting, linear and nonlinear programming, and solution of large problems. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Numerical Computation

CSCI 7222 (3) Topics in Nonsymbolic Artificial Intelligence

Topics vary from year to year. Possible topics include human and machine vision, signal and speech processing, artificial life, mathematical foundations of connectionism, and computational learning theory.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite CSCI 5622 or instructor consent required.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7412 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

Requisites: Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7422 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

Requisites: Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7717 (3) Topics in Database Systems

Studies topics such as distributed databases, database interfaces, data models, database theory, and performance measurement in depth.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of CSCI 5817 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Database Systems

CSCI 7772 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Artificial Intelligence

CSCI 7818 (3) Topics in Software Engineering

Studies selected topics of current interest in software engineering. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Software Engineering

CSCI 7900 (1-6) Doctoral Level Independent Study

For doctoral students.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

CSCI 8990 (1-10) Doctoral Dissertation

Investigates some specialized field of computer science. Approved and supervised by faculty members.

Repeatable: Repeatable for up to 30.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Computer Science

Critical Media Practices (CMDP)

Courses

CMDP 1400 (4) Introduction to Contemporary Media Cultures

Prepares students for critical practices in contemporary media cultures in a global context. Explores the diversity of media practices, including narrative and non-narrative forms, emphasizing aesthetics and visual studies. In lectures and labs students will explore video, sound, the internet and other multi-media platforms of expression.

CMDP 2010 (3) Information, Media and Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission and retrieval. Equips students with an understanding of technological transformations in interpersonal, organizational and mass communication. Emphasis is on the technological, social and political changes that underlie the movement toward a digital society.

Grading Basis: Letter Grade

CMDP 2100 (3) Approaches to Historical Media Practices

Investigate historical and cultural discourses in the formation of media practices. Examines practices such as performance media; cinematic media, media art, and their aesthetic alignment to cognate movements throughout history.

CMDP 2400 (3) Media Aesthetics

Builds students' ability to watch, reflect on, and write about media images. The course will be grounded in the analysis of media practices with special focus on media style and storytelling techniques. Explores media aesthetics from formal, cultural, and theoretical perspectives.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 2500 (3) Introduction to Media Practices

Working in design groups, students will explore the expressive potential of media through the production of short projects, discussions, readings, formal analysis, and critique. Provide a basic introduction to media practices as an extension of "visual thinking" and through approaches to storytelling, and hybrid media forms.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 2510 (1-3) Critical Media Practices Workshop 1

Training in narrow topics of media practices.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Media, Communication and Information (CMCI) or Arts and Sciences (ARSC) majors only.

CMDP 2600 (3) Creative Media Making

Focus on developing an understanding of the principles, forms and aesthetics of media production. Working in design groups on small-scale media preproduction and production exercises, screenings and critiques, students learn creative solutions to problems in realizing expressive media projects.

Requisites: Requires prerequisite courses of CMDP 1400 and CMDP 2500 (all minimum grade B-).

Grading Basis: Letter Grade

CMDP 2710 (3) Media Production Methods and Ideas

Explores creative approaches to idea formation, conceptualization, and organization for the moving image employing critical thinking, improvisation and visual storytelling techniques. Includes forms of creative writing, storytelling and preproduction techniques and strategies.

Requisites: Restricted to College of Media, Communication and Information (CMCI) or Arts and Sciences (ARSC) majors only.

CMDP 2720 (3) Animation

Explore computer animation in the making of short projects that may address topics such as: nonfiction, immersive environments and digital compositing. Designed to develop the student's understanding of movement, timing, scripting, editing and color composition. Through screenings and discussions students will gain an appreciation of history and practices of animation.

Requisites: Requires a prerequisite course of CMDP 2500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 2810 (3) Documentary Media Poetics

Investigates documentary cinema and media practices through class discussions, research papers, hands on exercises and the screenings. Cross-references documentary photography and moving-image documentary in the production of short digital projects. Explores the distinctive contributions of digital technologies to documentary image making.

Requisites: Requires prerequisite course of CMDP 2500 (minimum grade C-).

CMDP 2820 (3) Exploring Culture and Gender Through Film

Explores the concepts of culture and gender from an anthropological perspective through media. By experiencing texts, images and sounds about other ways of life, students will learn the basic concepts of cultural anthropology and learn to think critically about documentary and ethnographic media material.

Grading Basis: Letter Grade

CMDP 2860 (2) Performance Audio Recording

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering, addressing contemporary issues in technology, web, and performance media. Uses recorded material from in-class sessions. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2081

Requisites: Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 2870 (2) Recording Design

Provides hands-on instruction in various sound recording techniques. Addresses acoustics, sound reinforcement, studio maintenance and troubleshooting. Taught through labs and individual recording projects. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2091

Requisites: Requires prerequisite course of CMDP 2860 or MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 3110 (3) Electronic Arts Survey

Explores the development of electronic media art through screenings, readings, lectures and discussions.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3210 (3) Interactive Digital Cultures

Examines how the uses of interactive media have changed the classical dynamics of human communication, allowing multidirectional, non-linear and multimedia practices. In this course, students will study the various aesthetic, narrative, emotional and cultural elements of the interface in areas such as non-linear video, the web, games and hypermedia.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3310 (3) Performance Media Cultures

Reflect on the cultural construction of old and new performance media through the lens of emerging practices and contemporary discourse. From ancient theatre to cinema, interactive television to YouTube, and multi-media dance performances to computer games, this course explores how media shape, and are shaped by, various historical and contemporary audiences and contexts.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3350 (3) Modes of Documentary Media History

Introduces students to the variety of practices by examining their emergence, evolution and cultural impact in the global sphere. Students discover the major themes and genres in documentary work from photography, cinema, audio, hypermedia and the public debates they have engendered. Through lectures, screenings and research, develop critical perspectives on the international and transcultural dimensions of documentary media history.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 3450 (3) Critical Perspectives in Media Practices

Examines the contemporary landscape of media practices across platforms, such as film, social media, painting, video, and web art. This integrative exploration focuses on production contexts, circulation and reception through the lens of critical and interpretive frameworks. Drawing from key texts by major scholars and the works of media practitioners, students develop globally informed, critical perspectives for understanding.

Requisites: Requires a prerequisite course of CMDP 1400 (minimum grade C-).

CMDP 3500 (3) Digital Photographic Practices

Explores the creative possibilities of photography; students work on projects that combine concepts and techniques with contemporary practice and current modalities of exhibition and social distribution. Emphasis is placed on the student's personal growth through aesthetic and intellectual development in relation to current technologies.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3510 (1-3) Critical Media Practices Workshop II

Training in narrow topics of media practices. Open to CMCI students and by permission of the instructor.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3610 (3) Contemporary Image Making Practices

Provides students the technical skills for in depth exploration of the evolving principles and strategies of digital image making. Students will create small-scale projects with the primary emphasis on cinematographic experimentation and innovative visual techniques.

Requisites: Requires prerequisite course of CMDP 3500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3620 (3) Images and Stories

Learn and apply innovative non-traditional approaches to scripting and storytelling, including automatic thinking, idea sketches, visual notes, outlines and storyboards, serials, aleatoric methods, diagrams, locations, photographs and short stories. Focuses on methods of exploring scripting methods outside of the fixed and rule-bound traditional model of storytelling as a means of introducing students to discover their own scripting techniques.

Requisites: Requires a prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3710 (3) Digital Design

Introduces techniques, software and related concepts of digital design and image making through individual and group projects. Emphasizes digital animation, digital audio, digital video and website design and development as a means to formal and expressive ends. Introduces students to critical readings and theories related to digital media practice.

Requisites: Requires prerequisite course of CMDP 2010 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3720 (3) Multimedia Composition

Combine writing with media such as video, music, animation and podcasting on the computer. Includes a unit on web-site design and ends with each student creating their own website and posting on it the project they created for the course.

CMDP 3810 (3) Engaged Documentary Media Practices

Combining research, scripting methods and field trips, students produce short media non-fiction storytelling projects emerging from an engagement with historical events, contemporary issues and the world around us.

Requisites: Requires prerequisite courses of CMDP 2600 and CMDP 2810 (all minimum grade C-).

Grading Basis: Letter Grade

CMDP 3820 (3) Performance Media Practices

Develop a performance vocabulary within the context of various media platforms. Through creating individual and collaborative performance projects, students will explore performance design issues such as movement, blocking and staging with projection, sensors, sound and other media tools.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3830 (3) Advanced Performance Media Workshop

Study practical, technical and theoretical strategies of performing with and through media. This is an in-depth course that investigates a narrow scope drawn from topics that may include dance/movement, the illustrated lecture, projection environments, digital sensing, responsive lighting or acoustic strategies for performance.

Requisites: Requires prerequisite course of CMDP 3820 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3840 (3) Sound Practices

Explores the aesthetics of sound through the study of sound art and sound culture. Reading and discussion covers theories, technologies, and histories that drive the medium. Students apply concepts by designing and building their own soundscapes. Classes will be organized around hands-on activities, lecture, and discussion of readings. Instructor consent required.

Requisites: Requires prerequisite course of CMDP 2500 or CMDP 2860 or MUSC 2081 (minimum grade C-). Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 3860 (3) Introduction to Music Technology

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4081 and MUEL 4081

Requisites: Restricted to College of Music (MUSCU) or Department of Critical Media Practices (DCMP) undergraduate students only.

CMDP 3910 (3) Media Production Topics

Rotating topics in media production techniques.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of CMDP 2500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 3990 (3) Media Professional Seminar

Learn aspects of professional development in media production. Through workshops, class trips and assignments students will learn of the many opportunities found within media production.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4110 (3) Cultures of Digital Sound

Introduces students to a variety of critical scholarship and debates about our sonic environment through an examination of how sound interfaces with different facets of media production. Consisting of listening, analyzing and differentiating sound in different contexts, students will deepen their understanding of the relationship between sight and sound in cultural production.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4220 (3) Digital Archives in Media Practices

Examine the theories and methods underpinning the use of archival materials in non-fiction media production while simultaneously exploring questions of ethics, truth and representation that the use and manipulation of archives raises. Through weekly lectures, seminars, readings and screenings, students will discover the theories and interpretive approaches to understanding the archive and its uses.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4310 (3) Screen Culture and Globalization

Examine the formation of screen cultures (narrative, experimental, documentaries and multi-media video art) in the context of the cultural globalization of the moving image. Through lectures, seminars and research projects students explore the formation and evolution of screen cultures on various platforms such as digital cinema, web environments, video art, multi-channel installations and the moving image on mobile interfaces.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4320 (3) Media Engagement in Digital Diasporas

Offers students critical and interpretive frameworks for understanding the cultural and historical significance of digital diasporas and these communities' use of digital technologies for communication, community building and the creation of digital documents about migration and connectivity with the homeland.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4410 (3) Topics in Contemporary Media Technologies

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminar, students explore the work of contemporary thinkers and practitioners in the field.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4450 (3) Topics in Contemporary Media Technologies

Focus on the development and application of media technologies in moving image aesthetics and emergent media practices. Topics rotate according to faculty expertise, but may include new imaging technologies for small screen and mobile devices, web-specific media or emerging modes of production. Through lectures, screenings and seminars, students explore the work of contemporary thinkers and practitioners in the field.

Requisites: Requires prerequisite course of CMDP 2400 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4610 (3) Small Screen Storytelling

Shoot footage on or for mobile screens including narratives, microdocumentaries, music videos, short stories and collaborative exquisite corpse projects. Students will complete work and distribute through various outlets on the internet.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4620 (3) Media Environments

Explore the design and implementation of multimedia environments. Students will develop strategies for creating media exhibitions and/or performance environments with projection and sounds activated by sensors. This course is ideal for performers, dancers and media artists as well as those desiring to present information in novel ways, such as working with archival or non-fiction materials.

Requisites: Requires prerequisite course of CMDP 3830 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4630 (3) Introduction to Computational Media

Develop the technical and conceptual skills for computational media practices. Through individual and collaborative projects, students will explore the creative use of electronics and microcontrollers (including wearable and other embedded systems) through relevant programming environments. Introduces visual programming with a focus on signal processing for image and sound.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4640 (3) Multimedia Sound

Learn what sound is and where it comes from; how to create, analyze, alter, mix, and record it digitally in the studio and in the field; and how it can interact creatively with other media. In addition to analyzing how professionals use sound, students will create five sound-based projects of their own.

CMDP 4710 (3) Projection Practices

Design and implement projection-based media projects and explore projection practice as a distinct field. Through individual and collaborative projects, this course explores projection for live events, installation, moving images and site-specific or community-based projects. Students will be introduced to emergent software and hardware for projection design.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4720 (3) Installation and Performance Media

Focusing on live image and sound processing in constructed or natural environments, students will work individually or collaboratively on an installation project that engages with the intersection of performance and media. Potential models include site specific work, illustrated lecture, gallery installation, movement and dance with projection mapping, participatory media and virtual environments.

Requisites: Requires prerequisite course of CMDP 4620 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4730 (3) Digital Art and Emergent Technologies

Explores digital artistic practices across contexts and disciplines in various contexts. Emphasizes web and networked media as it applies to digital practices in sound, image, language, spatial and time-based arts.

Requisites: Requires prerequisite course of CMDP 2600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4810 (3) Advanced Documentary Practices

Combine research and production to produce short documentary media projects, which explore the world we live in. Focusing on practice, this course explores stylistic options employed on documentaries that give voice to different perspectives on the world. Students will be able to identify the tactics and strategies of documentaries in a variety of media, and will include visits with professional documentary makers. Students will complete a final documentary project.

Requisites: Requires prerequisite course of CMDP 3810 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4820 (3) Ethnographic Media

Explores emerging creative documentary practices through visual research, fieldwork, oral histories and the construction of innovative ethnographies. Through ethno-fiction, eco-ethnography, photography, indigenous media and cinema, students explore the development of ethnographic documentary and visual anthropology in both traditional and experimental forms. Projects are developed with an emphasis on the ethical and political challenges of representation through media technologies.

Requisites: Requires prerequisite course of CMDP 4810 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

CMDP 4860 (2) Computer Composition

Learn strategies and techniques for generating and manipulating sound with computer-specific tools. Students' projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia and performance projects.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4111

Requisites: Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade D-).

Grading Basis: Letter Grade

CMDP 4870 (3) Sound and Technology Topics

Exploration of issues, techniques and tools of music and sound technology. Topics vary and may include: interactive systems for performance; music and mobile media; electronic music instrument design; digital synthesis and signal processing; music in multimedia; sound practices and analysis. Lecture during work sessions will support student projects.

Requisites: Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4900 (3) Concepts and Practices of Contemporary Media

Explores the application of new media technologies in depth, and engages students in an ongoing dialogue about the cultural context of new media technologies and their own work. Students will produce a major media project that synthesizes methods of media making into modes of communication and expression. This is the capstone course for undergraduates in Media Production.

Requisites: Requires prerequisite course of CMDP 3500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

CMDP 5100 (3) Research and Methodologies Seminar

Explores documentary media preproduction tactics and strategies, including basic research approaches, planning, pre-visualization, stylistic approaches, scheduling, working with archive and documentary materials, and documentary ethics.

Requisites: Restricted to graduate students only.

CMDP 5370 (3) Choreography, Cinematograph: Writing in Motion

Examine media and moving image aesthetics, tactic and strategies by creating work involving movement and expanded notions of choreography. Within this course students compose images and sounds, structuring them temporally as they explore narrative and non-narrative forms.

Requisites: Restricted to graduate students only.

CMDP 5450 (3) Contemporary Documentary Media

Explores cross platform documentary media practices and contemporary debates in documentary through a study of documentary history, genre, ethics and changing forms. It develops skills in critically analyzing documentary media.

Requisites: Restricted to graduate students only.

CMDP 5500 (3) Documentary Production Workshops

Workshopping and developing technical skills in documentary media production.

Requisites: Restricted to graduate students only.

CMDP 5600 (3) Documentary Lab Seminar

Explores and workshops documentary media projects and ideas from a variety of disciplines. A team-taught course, with affiliated faculty working in design groups within the documentary lab in one or more areas, such as Art and Art History, Anthropology or Geography. A total of 12 hours are required for IDMP MFA candidates.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

CMDP 5650 (3) Documentary Field Work

Explores distinctive and varied approaches to documentary field work and the uses of media for creative ethnography and other nonfiction practices. A team-taught course, with affiliated faculty from one or more areas such as Art and Art History, Anthropology and Geography.

Requisites: Requires a prerequisite course of CMDP 5100 (minimum grade C-). Restricted to graduate students only.

CMDP 5900 (3) Documentary Production Topics

Incorporates reflective study and practice in a course that consists of rotating topics in contemporary documentary practices, such as media essays, observation and participation, personal histories and voices, emergent technologies and documentary media, and interpretive ethnography.

CMDP 5910 (3) Individual Project Study

Requires students to conduct self-directed research and production in a seminar setting. Topics relate to individual projects

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CMDP 6500 (5) Producing Practicum

Explores advanced producing principles through the preproduction of the MFA thesis project, including the development of a professional project proposal.

Requisites: Requires a prerequisite course of CMDP 5650 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 6600 (5) Documentary MFA Thesis Seminar I

Explores production of MFA thesis product. Focus is on production strategies, ethical challenges and other practical production issues.

Requisites: Requires a prerequisite course of CMDP 6500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 6650 (5) Documentary MFA Thesis Seminar II

Explores editing and post-production of the MFA thesis project.

Emphasizes aesthetic choices (structure, narration and music), distribution, contracts and audience.

Requisites: Requires a prerequisite course of CMDP 6600 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 6841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

CMDP 6871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMDP 7100 (3) Historical Overview of Media Arts and Technology

Explores a survey of historical trends in art and technology from the Renaissance to the contemporary global scene. Students investigate how artistic disciplines inform one another and how parallel developments in technology have played a significant role in the history of the arts. This course locates media arts within this broader historical context.

Grading Basis: Letter Grade

CMDP 7150 (3) Theoretical Overview of Media Arts and Technology

Surveys major theories of art, culture and technology formulated by both practitioners and theoreticians and examines conversations among technology studies, media theory and artistic practice. Students will investigate a variety of approaches, locating media arts within a broad range of theoretical perspectives.

Grading Basis: Letter Grade

CMDP 7200 (3) Research and Methodologies I

Introduces students to modalities of research and methodological practices in the context of media arts and technology. Strategies from a variety of academic disciplines will be critically engaged to provide a foundation for future work. Must be taken in sequence with CMDP 7250.

Grading Basis: Letter Grade

CMDP 7250 (3) Research and Methodologies II

Continues a discussion on modalities of research and methodological practices in the context of art and technology. Specific strategies from disciplines relating to students' individual research topics will be critically engaged to provide a foundation for future work.

Requisites: Requires a prerequisite course of CMDP 7200 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 7300 (3) Theories of the Avant-Garde

Explores various manifestations of avant-garde and experimental literature, art and media performance in the 20th century such as Cubism, Futurism, Dada, Surrealism, Theatre of the Absurd, the Situationists, Fluxus, Oulipo and others. Media forms analyzed will include manifestos, sound poetry, theatre, the novel, happenings, cinema, installation and other forms of historical avant-garde art practices.

Grading Basis: Letter Grade

CMDP 7400 (3) Contemporary Practices

Provides students with access to contemporary practices and discourses in media art and culture. The class engages professional practitioners through performances, field work and workshop encounters that may be open to the public. Students research, coordinate and present on biweekly guest presentations, with alternating weeks for reflection and discussion. Readings complement guest presentations.

Grading Basis: Letter Grade

CMDP 7410 (3) Topics in Cultures of Arts and Technology

Rotating topics in critical studies of media arts and technology.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

CMDP 7450 (3) Comprehensive Exam Seminar

Designed in a seminar format, this course reviews literature and concepts in all prior coursework and guides studies in their preparation for comprehensive exams. All ETMAP students must demonstrate their understanding of the fundamental concepts explored and developed in prior coursework in relation to individual areas of research.

Requisites: Requires prerequisite courses of CMDP 7100 and CMDP 7150 and CMDP 7250 and CMDP 7550 (all minimum grade C-).

Grading Basis: Letter Grade

CMDP 7500 (3) Production Methods I

Provides technical resources for students to work with emergent technologies in a media arts context. This is a team-taught, practice-based course addressing various production methods, from moving image and video to web and network media to computational media.

Grading Basis: Letter Grade

CMDP 7550 (3) Production Methods II

Builds on CMDP 7500 in developing technical skills with advanced new media forms. Projects are designed around students' individual areas of practice.

Requisites: Requires a prerequisite course of CMDP 7500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 7560 (3) Emergent Technologies: Theory and Practice

Explores how discreet modalities of media arts practices and their underpinning theoretical perspectives inform each other through the use of technology. Students investigate and develop theoretical perspectives on the exchange between art, technology and theory within their own research and the broader context of the contemporary social and cultural landscape.

Requisites: Requires a prerequisite course of CMDP 7150 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 7841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMDP 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

CMDP 7910 (3) Topics in Art and Technology: Methods and Ideas

Rotating topics on media arts practices.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

CMDP 8100 (3) Dissertation Development

Designed in a seminar format, this course guides students through the development of a practice-based dissertation in which constant critical thinking is required. Through intensive workshoping and close reading, this class guides students from the dissertation proposal to the opening stages of tangible, original research.

Grading Basis: Letter Grade

CMDP 8500 (3) Collaborative Studio Practice I

Explores approaches to media arts collaboration across disciplines. Through technological and social systems, students investigate the role of the artist. In analyzing contemporary work in an ongoing cycle of discussion, reading and art practice, students will respond to projects, texts and media in form of creative practice.

Requisites: Requires a prerequisite course of CMDP 7450 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 8510 (3) Collaborative Studio Practice II

Continues and expands the notions of collaboration across disciplines and media forms. Culminates in the public presentation of a collaborative project.

Requisites: Requires a prerequisite course of CMDP 8500 (minimum grade C-).

Grading Basis: Letter Grade

CMDP 8600 (1-6) Independent Studio Critique

Work under faculty supervision with individual and group critiques focusing on the development of a practice-based dissertation. Designed to be taken in conjunction with CMDP 8100.

Grading Basis: Letter Grade

CMDP 8991 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to graduate students only.

Curriculum Emphasis in Social Responsibility (CESR)

Courses

CESR 3040 (3) Fundamentals of Socially Responsible Leadership

Designed to build on the learning from MGMT 3030 and the rest of the management track curriculum, while adding more depth and breadth around the context managers operate within. Techniques used by current business leaders and seminal leadership scholars to prepare students to handle various leadership situations will be explored. Students will engage in oral and written presentations.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 3040

Requisites: Requires a prerequisite course of BASE 2104 and prerequisite or corequisite course of MGMT 3030 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4000 (1) Leadership Challenges I: Exercises in Moral Courage

Part one of two in a year long course, focusing on values and leadership at all levels of an organization. High-level executive guest speakers share stories about critical business dilemmas faced in their careers and evaluate student prepared responses to an ethical dilemma they present.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4001 (2) Leadership Challenges II: Exercises in Moral Courage

Part two of a year-long course focusing on values and leadership at all levels of an organization. High level executive guest speakers share stories about critical business dilemmas faced in their careers and evaluate student-prepared responses to an ethical dilemma they present.

Requisites: Requires a prerequisite course of CESR 4000 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4005 (3) Business Solutions for the Developing World: Learning through Service

Explores business opportunities to meet the needs of those living at the base of the economic pyramid. By partnering with organizations such as the Peace Corps and businesses with a social mission, students will learn how business (for-profit, social business, NGOs, social entrepreneurs, etc.) can meet the needs of the poor and operate sustainably.

Equivalent - Duplicate Degree Credit Not Granted: BUSM 3007

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 90-180 units completed.

CESR 4010 (3) Microfinance

In the last two decades, microfinance initiatives have provided the primary worldwide impetus to promote economic independence for the poor (1.4 billion). Microfinance links the financial markets with entrepreneurship to create a platform that facilitates financial inclusion to the poor. In a semester long project, students build a hypothetical financial institution that provides access to credit, saving, insurance and other services to a segmented poor population.

Equivalent - Duplicate Degree Credit Not Granted: FNCE 4832

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 90-180 units completed.

CESR 4130 (3) Sustainable Operations

Sustainable operations examines business strategies in response to environmental and social challenges. Grounded in resource efficiency, life-cycle thinking and a dose of investigative skepticism, the course assists students to thoroughly understand the scope of costs, benefits and risks associated with driving businesses toward sustainable operations.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4130

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4430 (3) Corporate Boards in Action

Allows students from any functional area of business to appreciate the difficulties modern boards and management face. Issues addressed include financial strategy; board composition; executive succession, tenure and compensation; management through crisis; sustainability and corporate social responsibility; the challenges and opportunities presented by globalization and international governance issues.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4430

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4440 (3) Privacy in the Age of Social Media

Privacy = the new currency. In a time where technology allows unprecedented aggregation of personal information use of "private" information is moving faster than social norms and laws can follow. We will dissect the technologies and social trends related primarily to privacy and use of information about individuals to reap profits. A good complement to business intelligence and analytics classes.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4440

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4821 (3) Values & Power of the Consumer in Society

As a critical stakeholder group, consumers have substantial power to shape business behavior. Students will develop an understanding of the roles business can play in society and the options and limitations that consumers have to influence business by exerting their purchasing power. This class is restricted to non-business majors and will not count toward the business major or business minor.

Requisites: Open to Non Business and Non Sponsored Students.

CESR 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Social Responsibility.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4826 (3) Exp. Sem-Social Entrepreneurship: Designing a Better World

See the future through the eyes of entrepreneurs who are addressing global and social environmental problems such as poverty and deforestation. Can the social ventures they create to solve these problems survive over time and will they achieve the impact they seek? We will meet some of these social entrepreneurs and, in teams, write case studies to tell their stories.

Equivalent - Duplicate Degree Credit Not Granted: ESBM 4826

Requisites: Restricted to non-Business majors with 60-180 units completed.

CESR 4827 (3) Integrated Reporting for Socially Responsible Strategies

Explores the growing global trend of companies to measure, disclose and report for socially responsible initiatives. Integrated reporting combines financial, environmental, social and governance information into a single report. Current practices in sustainability and integrated reporting in the US and across the world will be examined through case studies, guest speakers, current literature and projects. Can be taken concurrently with ACCT 3220.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 4827 and ACCT 5827

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4828 (3) Experimental Seminar: Corporate Boards in Action

Explores the complexity of corporate boards and the need for values-driven leadership. Students will consider corporate governance topics including: financial strategy, international challenges, ethics, corporate social responsibility, board composition, compensation and crisis management. Throughout the course, students will evaluate their own leadership and decision making abilities as they work together in student-run boards to address issues presented in a variety of case studies.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4828

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

CESR 4900 (1-3) Independent Study

Intended only for exceptionally well qualified business juniors and seniors. Departmental form required. Department enforced prerequisite: dean and instructor consent.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Dance (DNCE)

Courses

DNCE 1000 (2) Beginning Contemporary Dance Technique

Introduces students to the dynamic capabilities of the body as an articulate means of expression. Presents basic concepts and skills from contemporary dance forms that may include Afro-modern, floor work, inversion, classical modern and improvisation. Classwork develops efficient alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness. No experience necessary.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1012 (2) Dance Production

Provides the dancer with an introduction to the types of performance venues available today, and their technical systems and equipment. It will also establish an awareness of how technical theatre design arts may be utilized by a choreographer.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Production

DNCE 1013 (2) Dance Improvisation

An opportunity for students to develop skills of dance improvisation through the exploration of structured movement problems. Students study selected contemporary dance artists whose work stresses improvisation in performance and/or as a training vehicle. Department consent required for dance minors.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 1017 (3) Dance in Popular Culture and Media

Explores and contextualizes contemporary popular culture and dance. Introduces methods of critical analysis that reveal the rich heritage hidden within and around the dances students commonly encounter at the club, on the street, on television, on the big screen and elsewhere in everyday life. Through watching, reading, and discussion, students discover new meaning in their lived cultural experience.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Dance and Cultural Studies

DNCE 1020 (1) Beginning Contemporary Dance with Experience

Invites students to deepen their somatic awareness, efficient athleticism, and creative voice through the medium of contemporary dance. Continues the investigation of contemporary dance forms that may include Afro-modern, floor work, inversions, classical modern, and improvisation. Classwork will deepen students' alignment, strength, flexibility, coordination, rhythm, dynamics and spatial awareness.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1000 or previous dance experience.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1027 (3) Dance in Cultural Perception and Expression

Explores how the practice of dance can reflect, disrupt, subvert, support, and reinforce cultural expectations, norms and practices. Introduces international and domestic dance traditions and provides context for an interdisciplinary examination. Comparative readings from sociology, anthropology, gender studies, history, post-colonial studies, and political science provide a foundation to understand how cultural identities are negotiated and represented through movement.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts

Departmental Category: Dance and Cultural Studies

Departmental Category: Asia Content

DNCE 1091 (1) Modern 1

Introduces basic skills of modern dance. In-class technique work increases muscle strength, flexibility, and coordination. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 1100 (1) Beginning Ballet

Introduces beginning students to fundamental aspects of classical ballet technique; no previous experience required. Basic principles of alignment, rotation, and movement quality are introduced as the building blocks for success in advanced material. Foundational movements and ballet vocabulary are learned and refined. Students work toward mastery of simple combinations and rhythmic patterns.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1120 (1) Beginning Ballet with Experience

Relies on a demonstrated comprehension of kinesthetic and conceptual principles mastered at the beginning level. New movements from the classical ballet vocabulary are introduced with continued emphasis on alignment, rotation, and movement quality. Ballet sequences are longer and more complex.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1100 or previous ballet experience.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1190 (1) Ballet 1

Beginning ballet covering the basic vocabulary of classical ballet technique. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1200 (1) Beginning Jazz Dance

Introduces various styles of movement unique to jazz dance including improvisation, isolations, and African-influenced polyrhythms. Working within a range of dynamic performance styles, students will learn fundamental dance skills and jazz vocabulary, from which more advanced skills can be developed. Designed for students with little or no dance experience.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1220 (1) Beginning Jazz with Experience

Digs deeper into syncopated movement style of the jazz vernacular by continuing the embodied investigation of the Africanist influence on the form. Demands a rigorous awareness of efficient alignment while engaging with complex movement and challenging rhythmic structures.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1200 or previous dance experience.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1290 (1) Jazz 1

Introduces jazz dance, consisting of a technique warm-up, locomotion across the floor, and a series of dance phrases developed into a short dance combination. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 1301 (2) Hip-Hop Dance Technique 1

Introduces students to Hip-Hop dance as a culturally significant form. Students learn history, the social and political forces at work, and the fundamental techniques (Campbell Locking, Popping, Breaking etiquette/movements, Hip-Hop Party Dance and House). Intellectual challenge is offered through the lens of critical race theory and historical context. Training addresses flexibility, sequencing, coordination, and performance skills.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 1401 (1) Transnational Fusion Dance: USA and Middle East/North Africa

Introduces a fusion form popularized in 2000: secular dance traditions of the Middle East/North African (MENA) communities in dialog with popular dances of the hip-hop and underground electronic dance music communities. Stretching, hip work, spinal undulations and poly-rhythmic orientations are covered. Educational highlights include discourse regarding cultural appropriation and gender coding in human movement.

Repeatable: Repeatable for up to 2.00 total credit hours.

DNCE 1849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Freshman level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 1901 (1-3) Technique Practicum

Broadens students' exposure to a range of diverse movement material.

Topical course in dance technique, see subtopic for specific form.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technique

DNCE 1908 (1) First Year Dance Seminar

Designed for new dance majors as an introduction to the place of dance within academia and the professional/public spheres. Through the practice of descriptive dance writing, theoretical and physical exploration of discrete pedagogical and choreographic procedures, and interactions with in-class guest artists of different disciplines, students will engage in independent research and physical experimentation, culminating in a final personal presentation and group performance.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Performance

DNCE 2005 (3) Movement Awareness and Injury Prevention for the Dancer

Focuses on safe and effective dance practices supporting longevity and wellness. Areas explored include: experiential anatomy, conditioning, alignment, nutrition, injury prevention, care of common dance injuries, and experience with various somatic practices.

Requisites: Requires a prerequisite course of DNCE 2021 or DNCE 3041 or DNCE 4061 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Somatic Awareness

DNCE 2021 (2) Major Technique

Designed for Dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 2091 (1) Modern 2

Continuation of Modern 1. a developmental sequence of modern dance technique designed to refine the technical/expressive skills required of the professional dancer. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 2098 (1) Performance/Repertory

Students learn and perform dances from the repertory of guest artists. Offered summers only.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Performance

DNCE 2101 (1) Pointe

Introduces the basic training for the art of dancing in pointe shoes. Includes enchainements in pointe shoes and additional conditioning exercises for the feet and legs. Students should be at an Intermediate/Advanced ballet level with a strong understanding of rotation and alignment. No previous pointe experience necessary. Audition required.

Repeatable: Repeatable for up to 4.00 total credit hours.

Recommended: Prerequisite DNCE 3161 or DNCE 4181.

Additional Information: Departmental Category: Major Technique

DNCE 2141 (1) Low Intermediate Ballet

Builds on an existing understanding of alignment, rotation, and movement quality to introduce more mentally and physically difficult movements and enchainements of the classical ballet vocabulary. Students must be able to demonstrate an embodied familiarity with all traditional barre exercises on the first day of class.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1120 or previous ballet experience.

Additional Information: Departmental Category: Technique

DNCE 2191 (1) Ballet 2

Intermediate ballet, covering the complete vocabulary of classical ballet technique. Enchainements are of complex structure. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 2290 (1) Jazz 2

Continuation of Jazz 1. Studies coordination, rhythm, style, and advanced body part isolation in depth. Offered summers only at Perry-Mansfield Performing Arts Camp.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Nonmajor Technique

DNCE 2501 (2) African Dance

Explores the technique, styles, and rhythms of regional and national cultures of Africa. Areas of concentration may vary each semester (e.g. Ghana, Mali, Guinea, etc.). Introduces signature attributes common to different countries' dance traditions and features discussions of the musical traditions, histories, cosmologies, philosophies and aesthetics to contextualize and increase familiarity.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technique

DNCE 2701 (2) Contact Improvisation 1

Investigates movement vocabulary and kinesthetic understanding through physical contact and weight-sharing between two or more dancers. Fundamental skills of contact will be introduced and employed in duets and larger group improvisations: rolling, falling, giving and receiving weight, and the use of momentum and gravity.

Additional Information: Departmental Category: Major Technique

DNCE 2849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Sophomore level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 2901 (1-3) Technique Practicum 2

Topical course (second level) in dance technique, see subtopic for specific form. May require an audition.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Major Technique

DNCE 2909 (1-4) Special Topics

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4909 and DNCE 5909

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 3001 (2) Intermediate/Advanced Contemporary Dance Technique

Challenges intermediate and advanced students to refine their understanding and personal approach to the study of international contemporary dance. Demands a deep sense of somatic awareness, efficient athleticism, and creative voice. Floor work, inversions, and improvisation may be included. No audition required.

Repeatable: Repeatable for up to 4.00 total credit hours.

Recommended: Prerequisite DNCE 1000 or DNCE 1020 or any major technique course ending in "1" or previous dance experience.

Additional Information: Departmental Category: Technique

DNCE 3014 (2) Rhythmic Skills for Dancers

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class. Department consent required for dance minors.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Music

DNCE 3024 (2) Musical Resources for Dance

Examines how musical choices can profoundly affect audiences, dancers, and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues. Department consent required for dance minors

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Music

DNCE 3033 (3) Choreographic Resources

Explores movement invention and strategies of choreographic manipulation of body, space and time. Students add to their toolbox of compositional resources through solo and duet studies. Class interrogates and supports the students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3043. Formerly DNCE 2033.

Requisites: Requires a prerequisite course of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 3035 (1) Production Practicum

Practical production activities and projects within a designated area of dance design, stage technology, or stage management, normally related to the department's season. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Production

DNCE 3041 (2) Major Technique

Designed for dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 3043 (3) Choreographic Process

Examines physical and spatial relationships via group and site specific work. New methods of creative problem solving unearth and mine one's imagination and inspiration, cultivating the individual's unique process of dance-making. Class interrogates and supports students' developing language for addressing, critiquing and comprehending compositional choices and structures through verbal and written feedback practice. Can be taken out of sequence with DNCE 3033.

Requisites: Requires prerequisite courses of DNCE 1013 and DNCE 2021 or DNCE 3041 or DNCE 4061 (all minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 3101 (1-3) Ballet Practicum

Practical studio training in ballet at the advanced/professional level with a professional company. Designed for dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of DNCE 2141 or DNCE 3161 or DNCE 4181 (minimum grade C-).

Additional Information: Departmental Category: Major Technique

DNCE 3161 (1) Intermediate Ballet

Surveys a wide range of the intermediate-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Students must work efficiently to execute the technique with rhythmic accuracy, clarity of line, propriety of style, and fluency in translating names of steps. Enrollment by audition only.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 3241 (1) Intermediate Jazz

Expands student's performance of the syncopated movement style of the jazz vernacular. Designed for the experienced jazz dancer. Includes dance techniques that further improves alignment, strength, flexibility, and coordination within the jazz idiom through an emphasis on style, rhythm, and more challenging dance combinations.

Repeatable: Repeatable for up to 2.00 total credit hours.

Recommended: Prerequisite DNCE 1220 or previous dance experience.

Additional Information: Departmental Category: Technique

DNCE 3301 (2) Hip-Hop Dance Technique 2

Builds on fundamentals established in Hip-Hop Dance Technique 1. Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. The course focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 3601 (2) Alexander Technique for Actors and Dancers

Studies how human reaction, coordination, and movement play a role in all activities. Through in-depth class discussions, movement, exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 5601.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) or Theatre (THTR or TBFA, excludes THTR-MIN) majors only.

Additional Information: Departmental Category: Technique

DNCE 3801 (2) Major Technique: Multiple Accompanists

Designed for dance majors. Encompasses range of dance forms that require multiple accompanists. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 3849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Junior level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 3901 (1-3) Technique Practicum

Topical course (intermediate level) in dance technique. See subtopic for specific form. May require an audition.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technique

DNCE 4012 (1) Concert Production

Provides practical experience in producing formal and informal dance concerts. Introduces basic familiarity with production and promotional responsibilities, backstage and front-of-house duties and procedures. Meets with DNCE 5012.

Requisites: Requires a prerequisite course of DNCE 1012 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Major Technique

DNCE 4015 (3) Movement Analysis

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 5015.

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Movement Awareness Injury Prevent for the Dancer

DNCE 4016 (3) Creative Dance for Children

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5016

Requisites: Requires a prerequisite course of DNCE 2033 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Pedagogy

DNCE 4017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5017

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite or corequisite a Human Diversity core requirement course.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Dance and Cultural Studies

DNCE 4023 (2) Performance Improvisation Techniques

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5023

Additional Information: Departmental Category: Creative Process

DNCE 4036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialties of participants.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5036

Requisites: Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Pedagogy

DNCE 4037 (3) Contemporary Concert Dance: Shifting Perspectives in Performance

Focuses on the development of perceptual, descriptive, and analytical skills as well as the ability to apply cultural and critical theory to 20th and 21st century concert dance. Specific pieces of choreography are looked at from a broad range of perspectives.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite or corequisite a Human Diversity core requirement course.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Dance and Cultural Studies

DNCE 4038 (1-3) Dance Repertory

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5038

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Performance

DNCE 4046 (1) Teaching Practicum

Designed to give students supervised practical teaching skills through practice teaching, discussion, observation (in-person and video), reflection and feedback. Students will develop age appropriate lesson plans, define and refine principles of classroom management and understand the needs of diverse groups of students in a community, academic (K-12) and/or studio setting. All genres of dance are topic relevant.

Requisites: Requires a prerequisite course of DNCE 4036 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Pedagogy

DNCE 4047 (3) Hip-Hop Dance History

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 5047.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 4053 (3) Advanced Dance Composition

Focuses on deepening the artistic voice and engaging with other art forms. Students explore the integration of technology and collaboration in creative projects and continue to engage in an objective critical process of their own work and the work of others. Meets with DNCE 5053.

Requisites: Requires a prerequisite course of DNCE 3043 (minimum grade C-). Restricted to Dance (DNCE or DBFA, excludes DNCE-MIN) majors only.

Additional Information: Departmental Category: Creative Process

DNCE 4061 (2) Major Technique

Designed for dance majors. Enrollment by audition only.

Repeatable: Repeatable for up to 16.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Major Technique

DNCE 4128 (1) Ballet Repertory

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and New-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 5128.

Repeatable: Repeatable for up to 2.00 total credit hours.

Additional Information: Departmental Category: Performance

DNCE 4181 (1) Advanced Ballet

Investigates the full range of the advanced-level classical ballet vocabulary, focusing on an anatomically sound approach to the material. Exercises require strength and a deeply subtle understanding of principles of alignment, rotation, epaulement, and movement quality. Class moves quickly through enchainements of complex structure. Enrollment by audition only.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 4261 (1) Advanced Jazz Dance Technique

Refines advanced students' approach to the nuances and virtuosity of jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 5261.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Technique

DNCE 4701 (2) Contact Improvisation 2

Builds upon skills introduced in DNCE 2701 and moves into more rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 5701.

Requisites: Requires a prerequisite course of DNCE 2701 (minimum grade C-).

Additional Information: Departmental Category: Major Technique

DNCE 4849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member. Senior level course.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 4909 (1-4) Special Topics

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 2909 and DNCE 5909

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study

DNCE 4919 (1-3) Dance Practicum

Project in dance under supervision of senior faculty.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 5919

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

DNCE 4939 (1-3) Dance Internship

Provides an opportunity for upper-division dance majors to serve apprenticeships in the community in work areas related to their major interests and career goals. Internships are available in areas such as arts administration, dance therapy, and technical production. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Independent Study

DNCE 5001 (2) Graduate Technique

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5012 (1) Concert Production

Meets with DNCE 4012.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Production

DNCE 5014 (2) Graduate Rhythmic Skills

Enhances rhythmic acuity through intensive rhythmic drills, analytical listening, drumming, notating and creating rhythm-based performance work. Course material explores non-Western rhythmic paradigms, irregular meters, mixed meters, poly-meter, polyrhythms, etc., and how to communicate clearly with a live accompanist in technique class. Meets with DNCE 3014.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Music

DNCE 5015 (3) Movement Analysis

Introduces Rudolf Laban's theories of movement and exposes several body therapies to heighten students' awareness of movement as a multifaceted (neuromuscular/spatial/dynamic) event. Emphasizes refinement of movement, observation skills, and improvement of performance. Meets with DNCE 4015.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Movement Awareness Injury Prevent for the Dancer

DNCE 5016 (3) Creative Dance for Children

Methods course for prospective teachers of creative dance for children. Lectures, readings and laboratory experiences are followed by observation and teaching in primary grades.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4016 (with addition of readings and a paper)

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 5017 (3) Dancing Histories: Sex, Gender and Race in U.S. Concert Dance

Traces the evolution of American concert dance through roots in select dance forms, including dances of the African Diaspora, Ballet, Social Dance, Jazz, Modern, and Folklorico. Studies specific dance artists against the backdrop of social, political, economic, and environmental issues.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4017, with addition of graduate papers and/or a project

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 5023 (2) Performance Improvisation Techniques

Explores movement and vocal improvisational techniques to enhance creative, interdisciplinary, collaborative and performance skills. Helps individuals expand their definition of performance, discover and access the diversity of the human instrument and employ improvisation to create personal and social commentary.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4023 (with the addition of written analysis and creative assignments)

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Creative Process

DNCE 5024 (2) Graduate Musical Resources

Examines how musical choices can profoundly affect audiences, dancers, and the creative process. Surveys historic and contemporary music styles and influential artists through guided listening and experimentation. Deepens understanding of music, including vocabulary, technology, collaboration skills, ethics, and copyright issues. Meets with DNCE 3024.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Music

DNCE 5036 (3) Dance Teaching Practices: Inclusive Approaches to Instruction

Examines legal, practical, pedagogical and philosophical issues in current dance education. Goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. All genres of dance may be utilized depending on the specialities of participants.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4036

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 5038 (1-3) Dance Repertory

Learning and performing dances from the repertory of current faculty members, artists-in-residence and upon occasion from the repertory of historic modern dancers. Graduate students are required to keep a log of the learning process involved in repertory to document and analyze each work in terms of stylistic differences, musical/sound accompaniment and trends. Dance majors may repeat up to 9 total credit hours with different instructors. Enrollment by audition only.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4038

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Performance

DNCE 5047 (3) Hip-Hop Dance History

Addresses the origin and evolution of American Hip-Hop dance rooted in a theoretical structure that springs from the elemental nature of the African Diaspora. Emphasis placed on the social, political, and economic environment in which it was fashioned. Pioneers, innovators, terminology, and styles will be identified. Course includes lectures, readings, audio/video analysis and discussion. Meets with DNCE 4047.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 5048 (1-4) Performance and Community Engagement

Engages students in harnessing the power of performance for effecting positive social change. Students work collaboratively to create performances and workshop experiences. Readings will provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations to internationally author the future they want. Open to all forms of performance - music, film, dance, theatre.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Performance

DNCE 5052 (1-3) Studio Concert

Provides the opportunity for choreographic and performative synthesis and experimentation via the execution of a project related to the student's major area of creative research. Project must be approved by the student's first reader.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Production

DNCE 5053 (3) Advanced Dance Composition

Meets with DNCE 4053.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Creative Process

DNCE 5056 (2) Graduate Teaching Seminar

Examines practical, pedagogical, philosophical, and legal issues in current dance education. The goals and content of professional and recreational dance training are considered and strategies for effective teaching practice are discussed. Provides practice in practical application of theoretical material. All genres of dance may be utilized.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 5064 (2) Music and Dance Seminar: Collaboration

Investigates music in relation to dance performance, choreography, and teaching. Topics may include: a survey of musical styles and composers; direct experimentation with composition and recording techniques; enhancement of rhythmic versatility; work with accompanist/composers; and/or improvement of analytical listening and writing skills.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Music

DNCE 5101 (1) Intermediate Graduate Ballet

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5128 (1) Ballet Repertory

Develops understanding of the ballet canon through practice of major solos from Romantic, Classical, and Neo-Classical ballets. For the advanced classical ballet student. Enrollment by audition only. Meets with DNCE 4128.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Performance

DNCE 5261 (1) Advanced Jazz Dance Technique

Refines advanced students' approach to the nuances and virtuosity of the jazz idiom. Emphasis is placed on efficient use of alignment, complex polyrhythmic explorations and improvisations, and dynamic performance style. Class moves quickly through material and demands a high level of proficiency. Enrollment by audition only. Meets with DNCE 4261.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5301 (2) Graduate Hip-Hop

Students deepen their understanding of Hip-Hop history through fundamental movement techniques, specifically, House, and study the social/political forces at work. The course focuses on increasing dancers' capacity for variation, sequencing, musicality and free-styling in Hip-Hop dance. Enrollment by audition only. Meets with DNCE 3301.

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Major Technique

DNCE 5601 (2) Alexander Technique for Graduate Students

Studies how human reaction, coordination, and movement play a role in all activities. Graduate students will explore direct application to dance training, performance, choreography, and teaching. Through in-depth class discussions, movement exploration, and individualized hands-on lessons, actors and dancers gain an understanding of the technique and its benefits to performance. Meets with DNCE 3601.

Requisites: Restricted to Dance (DNCE) or Theatre (THTR) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5701 (2) Contact Improvisation 2

Moves into rigorous exploration of weight sharing principles. Emphasis will be placed on ease and efficiency in partnering, and integrating this work into choreography and performance. Meets with DNCE 4701.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5801 (2) Grad Technique: Multiple Accompanists

Encompasses range of dance forms that require multiple accompanists.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 5901 (1-3) Graduate Technique Practicum

Offers special courses in the technique series. Course may meet at the same time with an undergraduate studio course and includes the practical movement experience with an additional scholarly study of specially chosen issues in dance.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 5909 (1-4) Special Topics

Explores topics and research in relation to areas such as technology, environment, teaching methods, performance, world dance, arts in society, and/or criticism that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 2909 and DNCE 4909

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 5919 (1-3) Dance Practicum

Project in dance under supervision of senior faculty.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 4919

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6009 (1) Research Strategies and Techniques

Examines research methodologies appropriate to the performing arts, particularly theatre and dance. Projects are aimed at familiarizing graduate students with the library and other resources, and the development of thesis and dissertation prospectuses.

Equivalent - Duplicate Degree Credit Not Granted: THTR 6009

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6016 (2) Teaching Lab-Contemporary Dance

Provides opportunity to apply principles and skills introduced in DNCE 5056. Participating students share the responsibility for teaching a lab class that meets twice a week. Focuses on development, analysis and evaluation of teaching skills.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 6017 (3) Readings in Dance

Serves to familiarize participants on a broad range of issues and artists influencing current dance production, performance, and practices. All genres of dance may be utilized to cultivate new capacities in critical thought, written expression, personal ethics, and artistic depth.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 6047 (3) Seminar: Dance

Intensive study of selected topics related to the art of dance, dance criticism, dance aesthetics, and dance in relationship to historical, social, and cultural environments with an emphasis on contemporary American forms and their roots.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Dance and Cultural Studies

DNCE 6056 (2) Professional Development

Examines current trends and issues in dance education and the professional dance world. Explores curriculum development, administration, and job opportunities along with other topics such as grant writing, community engagement, dance advocacy, and working as an independent artist.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Pedagogy

DNCE 6073 (3) Choreography

Covers in-depth practical and theoretical approaches to dance composition for graduate students; solo and group forms; and analysis of historical and contemporary dance works.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Creative Process

DNCE 6101 (1) Advanced Graduate Ballet

Open only to graduate dance majors.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Major Technique

DNCE 6849 (1-3) Independent Study

Involves creative or scholarly investigation of an area of interest to the student not addressed in the curriculum. Work must be arranged with and advised by a faculty member.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6919 (1-3) Directed Studies

Explores advanced topics in dance not regularly covered in the curriculum of the graduate program.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6949 (1) Candidate for Degree

Requisites: Restricted to Dance (DNCE) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Independent Study

DNCE 6959 (1-6) Master's Thesis

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

DNCE 6969 (1-6) The Graduate Project

Provides the opportunity for synthesizing the graduate experience through the execution of a project related to the student's major area of interest. Project must be approved by the graduate faculty advisor.

Requisites: Restricted to Dance (DNCE) graduate students only.

Additional Information: Departmental Category: Independent Study

Danish (DANE)

Courses

DANE 1010 (4) Beginning Danish I-DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society.

Additional Information: Departmental Category: Danish Courses

DANE 1020 (4) Beginning Danish II-DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Danish history and contemporary culture and society. Department enforce prerequisite: DANE 1010 (min grade C-).

Additional Information: Departmental Category: Danish Courses

DANE 2010 (4) Intermediate Danish I - DILS

Building on the skills that the students have acquired in Beginners Danish I-II, this course offers additional reading, writing, speaking and verbal comprehension. Students will learn to conduct business at a government office, talk about holidays and festivals and discuss conservation and environmental protection. They will read and write small texts, becoming exposed to differences between written and spoken Danish.

Requisites: Requires prerequisite course of DANE 1020 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Danish Courses

DANE 2020 (4) Intermediate Danish II - DILS

Offers extensive reading, writing, speaking and verbal comprehension skills in Danish. The students will discuss Danish history, cultural differences and stereotypes, politics, social groups, learn how to write letters and email in Danish, read short texts and write short essays on the above topics.

Requisites: Requires prerequisite course of DANE 2010 (minimum grade C-).

Additional Information: Departmental Category: Danish Courses

East Asian Languages & Civilizations (EALC)

Courses

EALC 4911 (3) Practicum in Asian Languages 1

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

Additional Information: Departmental Category: Asia Content

EALC 4912 (3) Practicum in Asian Languages 2

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

Additional Information: Departmental Category: Asia Content

EALC 4913 (3) Practicum in Asian Languages 3

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

Additional Information: Departmental Category: Asia Content

EALC 4914 (3) Practicum in Asian Languages 4

Introduces elementary or intermediate East Asian language, culture, and language pedagogy. Department consent required.

Additional Information: Departmental Category: Asia Content

EALC 4930 (1-6) Internship

Selected students are matched with supervised internships in business, public and private service organizations, and educational institutions. Internships focus on opportunities to apply language and cultural skills. Students meet regularly with instructor and supervisor, keep a journal, and submit a final paper.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of JPNS 2120 or CHIN 2120 (minimum grade C).

Recommended: Prerequisite JPNS 3120 or CHIN 3120.

Additional Information: Departmental Category: Asia Content

Ecology & Evolutionary Biology (EBIO)

Courses

EBIO 1010 (3) Introduction to Quantitative Thinking for Biologists

Focuses on the collection, visualization and analysis of data that are relevant for advancing critical thinking, student-directed learning, and the development of quantitative analysis skills, with an emphasis on using R and examples from ecology and evolutionary biology.

Grading Basis: Letter Grade

EBIO 1030 (3) Biology: A Human Approach 1

Lect. Studies the principles of biology and their implications. Central theme is humans and the environment, emphasizing ecology, natural resource conservation, and the interrelatedness of a growing human population. Recommended for nonscience majors.

Additional Information: Arts Sci Core Curr: Natural Science Sequence
MAPS Course: Natural Science

EBIO 1040 (3) Biology: A Human Approach 2

Lect. Continues EBIO 1030, focusing on the function of the human body, and maintenance of dynamic equilibrium in the internal environment in the face of a continually changing external environment. Discusses factors influencing these homeostatic conditions and how and why they change. Recommended for nonscience majors.

Recommended: Prerequisite EBIO 1030 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Sequence

EBIO 1050 (1) Biology: A Human Approach Laboratory

One two-hour lab per week. Provides experiments and exercises relating to concepts presented in EBIO 1030 and EBIO 1040. Uses animals and/or animal tissues. Recommended for nonscience majors. When taken with EBIO 1030, meets the MAPS requirement for natural science: lab.

Additional Information: Arts Sci Core Curr: Natural Science Lab
MAPS Course: Natural Science Lab or Lab/Lec

EBIO 1210 (3) General Biology 1

Lect. Provides a concentrated introduction to molecular, cellular, genetic, and evolutionary biology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec
Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Natural Science

EBIO 1220 (3) General Biology 2

Provides a concentrated introduction to organisms, homeostasis, development, behavior, and ecology. Emphasizes fundamental principles, concepts, facts, and questions. Intended for science majors.

Recommended: Prerequisite EBIO 1210 (minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

EBIO 1230 (1) General Biology Laboratory 1

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 1. Intended for science majors.

Recommended: Prerequisite or corequisite EBIO 1210 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physicl Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science

EBIO 1240 (1) General Biology Laboratory 2

One 3-hour lab per week. Consists of experiments and exercises to provide an extension of basic concepts and scientific approaches presented in General Biology 2. Intended for science majors.

Recommended: Prerequisite or corequisite EBIO 1220 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physicl Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

EBIO 1300 (1-3) Topics in Biological Sciences

Covers special topics in biology for freshmen or nonmajors. Introduces scientific methods and principles in biology, as well as issues of current interest in biology. Does not count toward the major in EBIO.

EBIO 1940 (3) College Writing for Science Students

Introduces first year students to college writing, focusing on developing academic research and writing skills of particular interest to science students. Emphasizes habits of mind in topic invention, drafting, revision and writing style, as well as critical thinking and information literacy.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Arts Sci Core Curr: Written Communication

EBIO 2010 (1-3) Environmental Issues and Biology

Lect. Describes how the natural environment is currently stressed by a variety of human actions. Examines the nature of these environmental problems and their impact on living organisms, both human and nonhuman species.

EBIO 2040 (4) Principles of Ecology

Lecture and laboratory. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2640 and ENVS 2000

Recommended: Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 2070 (4) Genetics: Molecules to Populations

Lect. and rec. Covers principles of genetics and developmental biology at levels of molecules, cellular organelles, individuals and populations; asexual and sexual life cycles; heredity. Recitations allow discussion of genetics problems and implications of genetic principles and provide demonstrations and simulations of genetic processes. Intended for sophomore majors in EBIO.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2640

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Sequence

EBIO 2090 (3) Tropical Island and Marine Ecology

Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, dispersal, colonization, physiology and adaptations. Includes study of beach and coral formation, island organisms and their population dynamics. Students may also register for an optional 1 credit, one week, tropical island and coral reef trip that complements the lecture portion of the class but has an additional cost.

Recommended: Prerequisite EBIO 1220 (minimum grade C-).

EBIO 2091 (3) Field Studies in Marine and Island Ecology and Oceanography

Investigates tropical island and marine ecology as well as all four disciplines of oceanography. A three-credit course focused on a tropical island ecology and oceanography field trip that complements the lecture portion of EBIO 2090 and ATOC 3070 with an additional cost. Examines fundamental concepts of marine ecology, emphasizing organismal diversity, species interactions, study of beach and coral formation, island formation, organisms and their population dynamics. The course consists of a one-week field trip to the Keys Marine Laboratory in the Florida Keys and once-weekly class room meeting (of variable duration from 1-4 hours) throughout the semester.

Requisites: Requires a corequisite course of EBIO 2090 or ATOC 3070 or GEOL 3070.

Grading Basis: Letter Grade

EBIO 2640 (5) Honors Principles of Ecology

Lect., lab, and rec. Introduces principles of ecology, emphasizing patterns and processes at various levels of biological organization. Scope global, but examples often from local environment. Laboratory emphasizes techniques of field biology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2040 and ENVS 2000

Recommended: Prerequisites EBIO 1030 and EBIO 1040 and EBIO 1050 or EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

Additional Information: Arts Sciences Honors Course

EBIO 2840 (1-6) Independent Study: Lower Division

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EBIO 3010 (1-2) Teaching Biology

Provides an opportunity to assist in teaching of specific lecture or laboratory section in EBIO under direct faculty supervision. Students must first make arrangements with the appropriate faculty member and turn in a form to the EBIO office.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

EBIO 3040 (4) Conservation Biology

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3040

Recommended: Prerequisite EBIO 2040 or EBIO 2640 or ENVS 2000 (minimum grade C-).

EBIO 3080 (4) Evolutionary Biology

Lect. and lab. Emphasizes the fundamental evolutionary concepts that provide explanations for the diversification of life on Earth.

Specific topics include the evidence for evolution, adaptation by natural selection, speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and processes. Recitations allow students to explore specific topics in more depth and smaller groups.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 3680

Recommended: Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

EBIO 3110 (3) Population and Community Ecology

Presents principles of ecology that relate to the niche, population growth, metapopulations, population interactions (within and between trophic levels), community structure and development, landscape ecology and species diversity.

Recommended: Prerequisite EBIO 1240 or EBIO 2640 (minimum grade C-).

EBIO 3170 (3) Mountain Ecology and Conservation

Focuses on the ecology of mountain environments around the world, including climatic gradients, plant and animal diversity and distributions, habitat zonation, evolutionary processes, and various aspects of montane conservation from habitat change to climate change.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 (minimum grade C-).

EBIO 3180 (3) Global Ecology

Lect. Involves study of ecological principles and problems at the biosphere level. Presents a worldwide approach to populations, biotic resources, ecologic interactions, land use, deforestation, desertification, species extinctions, pollution, environmental quality, global change, and environmental ethics.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

EBIO 3190 (3) Tropical Marine Ecology

Lect. Examines the biology and ecology of marine ecosystems, emphasizing those occurring in tropical regions such as coral reefs. Studies how these ecosystems are changing and the future impact of human stress on the marine environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite any two-semester introductory biology course.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

EBIO 3240 (4) Animal Behavior

Lect. and lab. Topics include basic concepts and history, methods of study, ethical issues, neurobiology, behavior, the development of behavior, predator-prey relationships, communication, aggression and dominance, mating systems, cognitive ethology, and parental care. When possible, life-history strategies, the evolution of behavior, and behavioral ecology are stressed. Uses animals and animal tissues.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3270 (3) Ecosystem Ecology

Integrates information from physics (e.g., energetics), chemistry (the behavior of basic elements), and biology (evolutionary traits of species, multiple photosynthetic pathways, etc.) to understand the structure and functioning of ecosystems. Provides the background and necessary information to understand controls on photosynthesis, decomposition, and nutrient cycling across diverse terrestrial and aquatic landscapes.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 (minimum grade C-).

EBIO 3400 (3) Microbiology

Surveys distinguishing characteristics of microorganisms based on structural-functional relationships, taxonomy, growth and physical-chemical agents of control including antibiotics, metabolism and genetics. Introduces applied microbiology emphasizing infectious diseases, basic concepts of immunology and microbial ecology. Uses animals and/or animal tissues.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3410 (1) Microbiology Lab

Accompanies EBIO 3400.

Requisites: Requires a prerequisite or corequisite course of EBIO 3400 (minimum grade D-).

Grading Basis: Letter Grade

EBIO 3590 (4) Plants and Society

A writing intensive course for majors and non-majors which acquaints students with the history of plant use in our society. Topics center on the evolving relationship between humans and plants as food sources, medicines, fuel, and other products, such as fibers and dyes.

Grading Basis: Letter Grade

EBIO 3630 (4) Parasitology

Lect. and lab. Surveys animal parasites, including life histories; emphasizes parasites of humans. Uses animals and/or animal tissues.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3680 (5) Honors Evolutionary Biology

Lect., rec., and co-sem. Emphasizes the fundamental evolutionary concepts that provide explanation for the diversification of life on Earth. Specific topics include the evidence for evolution, adaptation by natural selection speciation, systematics, molecular and genome evolution, and macroevolutionary patterns and process. Recitations allow students to explore specific topics in more depth and smaller groups.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 3080

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2070 (minimum grade C-).

Additional Information: Arts Sciences Honors Course

EBIO 3850 (4) Animal Diversity: Invertebrates

Lect. and lab. Offers a broad study of the biology of the most diverse group of organisms on Earth. Areas include ecology, physiology, evolution and morphology of aquatic and terrestrial forms. Uses animals and/or animal tissues.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 3930 (1-6) Internship

Provides an academically supervised opportunity for upper-division students to work in public or private organizations. Projects are usually related to students' career goals. Each project has both academic and work components. Pass/fail only.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

EBIO 3940 (3) Written Communication in the Sciences

Focuses upon communication commonly practiced by scientists, with special emphasis on writing. Directs attention to scientists' strategic use of written arguments, statistical data and visual representations. Prepares students for communication tasks within advanced study and professional work.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr. Written Communication

EBIO 3980 (1) Seminar: Introduction to EBIO Honors

Presents an introduction to the departmental Honors program. Consists of a lecture component on Honors research, thesis, and defense, as well as a seminar component where students present the findings of their library research, conducted under guidance of a faculty mentor, and hear presentations by graduating Honors candidates on their thesis research.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites minimum 3.2 GPA and a declared EBIO major and approval by departmental honors committee.

Additional Information: Arts Sciences Honors Course

EBIO 3990 (1-3) EBIO Honors Thesis Research

Provides an introduction to the departmental Honors program. Consists of individual library research on a potential Honors thesis topic under the guidance of a faculty mentor.

Requisites: Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

Recommended: Prerequisites minimum 3.2 GPA and approval by departmental honors committee.

EBIO 4030 (3) Limnology

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5030

Recommended: Prerequisites EBIO 1210 and EBIO 1220 (minimum grade C-).

EBIO 4060 (3) Landscape Ecology

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5060

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4070 (3) DNA Methods in Ecology and Conservation Biology

Acquiring skill with molecular methods in ecology and conservation biology is most quickly accomplished with hands-on experience.

Combines classroom lectures with collecting in the field and laboratory exercises to provide experience extracting DNA, amplifying DNA with the Polymerase Chain Reaction (PCR), designing PCR primers, sequencing DNA and editing and aligning sequences with the Sequencher software.

Requisites: Requires prerequisite course of EBIO 2070 (minimum grade C).

Grading Basis: Letter Grade

EBIO 4080 (4) Freshwater Phycology

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5080

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4090 (2) Coral Reef Ecology

Includes one week of lectures in Boulder and one week of field studies on one of the most complex and beautiful ecosystems in the world, the Caribbean reefs at Cozumel, Mexico. Two week, fall-semester course beginning after Christmas. Scuba certification required.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite any ecology course is a highly recommended.

EBIO 4100 (3) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5100

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4120 (2-4) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4140 (3) Plant Ecology

Examines the relationships between plants and their physical and biological environments, encompassing physiology, competition, plant-soil and plant-animal interactions, population dynamics, diversity, and influence on ecosystem function.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4150 (1-2) Techniques in Ecology

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5150

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 and EBIO 2040 or EBIO 2640 (minimum grade C-).

EBIO 4160 (3) Introduction to Biogeochemistry

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4160 and GEOL 4160

Recommended: Prerequisites GEOL 3320 or EBIO 3270 and CHEM 1011 (minimum grade C-).

EBIO 4175 (3) The Scientific Basis for Ecosystem Management of Public Lands

An advanced field ecology course emphasizing measurements, statistical procedures and biotic data information management relevant to land management issues. Develops concepts of adaptive ecosystem management using ongoing field studies on public land in the Colorado Front Range.

Recommended: Prerequisites EBIO 3270 and EBIO 4500 (minimum grade C-).

EBIO 4270 (3) Population Genetics

Provides an in-depth introduction to population genetics. Lectures and discussions will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. Following an introduction to population genetic theory, we will investigate current topics in the field.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5270

Requisites: Requires prerequisite courses of EBIO 2070 and EBIO 3080 (all minimum grade C-).

Grading Basis: Letter Grade

EBIO 4290 (4) Phylogenetics and Comparative Biology

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5290

Recommended: Prerequisite EBIO 3080 (minimum grade C-) or instructor consent required.

Grading Basis: Letter Grade

EBIO 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5340 and ENVS 4340 and ENVS 5340

Recommended: Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

EBIO 4410 (4) Biometry

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5410

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4420 (3) Computational Biology

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5420

Grading Basis: Letter Grade

EBIO 4440 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5440 and MCDB 4441 and MCDB 5441

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

EBIO 4460 (1-5) Special Topics

Familiarizes students with specialized areas of biology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5460

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4500 (4) Plant Biodiversity and Evolution

Lect. and lab. Surveys plant types emphasizing diagnostic features of plants in general and major taxa in particular. Focuses on identity, morphology, anatomy, reproduction, ecology, geography, evolution, fossil record, and economic use of taxa.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4510 (4) Plant Anatomy and Development

Lect. and lab. Introduces structures of seed plants, especially angiosperms, and developmental history of these structures. Studies cell types, and their location and function in plant tissues and organs. The laboratory provides an opportunity to examine plant tissues and to prepare tissues for examination by the light microscope. Stresses role of plant structures in the living plant.

Recommended: Prerequisites, EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4520 (4) Plant Systematics

Lect. and lab. Studies the principles and techniques of modern systematics of organisms, illustrated with examples from the plant kingdom, usually the angiosperms. Framework of course is evolutionary and ecological, as well as taxonomic.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5520

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

EBIO 4530 (4) Functional Plant Biology

Lect. and lab. Explores mechanisms of plant functioning and how such functioning relates to the performance of the plant under different environmental conditions. Phenomena include water relations, growth and development, and metabolic processes including photosynthesis, respiration, and responses to stress.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4550 (4) Plant Eco-Evo-Devo

Explores the fundamental principles of plant form from the perspectives of ecological function, evolutionary origin, and developmental dynamics. Students are presented with conceptual and analytical tools to interpret the vast diversity of growth form-function relationships that exist among plants. Laboratory sessions apply concepts presented in lecture and students will engage in original research using light and scanning electron microscopy.

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4600 (4) Evolutionary Ecology

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5600

Requisites: Requires prerequisite courses of EBIO 2040 and EBIO 3080 (all minimum grade C-).

Grading Basis: Letter Grade

EBIO 4640 (2-4) Plant Field Studies

Includes field-oriented courses offered at irregular intervals during the academic year or during summer sessions.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites EBIO 2040 and EBIO 2640 (minimum grade C-).

EBIO 4660 (4) Insect Biology

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5660

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4740 (3) Biology of Amphibians and Reptiles

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5740

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4750 (4) Ornithology

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5750

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 1230 and EBIO 1240 (minimum grade C-).

EBIO 4760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5760 and MUSM 5760

Recommended: Prerequisites EBIO 1210 and EBIO 1220 and EBIO 2040 and EBIO 2640 (minimum grade C-).

EBIO 4800 (3) Critical Thinking in Biology

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 5800

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite minimum of 14 hours of EBIO course work.

EBIO 4840 (1-6) Independent Study: Upper Division

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EBIO 4860 (1-2) Critical Thinking in Biology - Lab**EBIO 4870 (1-6) Independent Research: Upper Division**

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EBIO 4980 (1) Seminar: EBIO Honors Thesis

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

Recommended: Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental honors committee.

Additional Information: Arts Sciences Honors Course

EBIO 4990 (1-3) EBIO Honors Thesis Research

To be taken during the final academic year prior to graduation. Consists of the final phase of honors research and thesis preparation under the guidance of a faculty mentor.

Requisites: Restricted to Ecology and Evolutionary Biology (EBIO) majors only.

Recommended: Prerequisites minimum 3.3 GPA and a declared EBIO major and approval by departmental Honors program.

Additional Information: Arts Sciences Honors Course

EBIO 5000 (1) EBIO Colloquia

All first year EBIO graduate students are required to attend the EBIO Colloquia Series. Speakers from around the world and within the department cover topics in all areas of biology.

Repeatable: Repeatable for up to 2.00 total credit hours.

EBIO 5030 (3) Limnology

Examines the ecology of inland waters, including a detailed consideration of physical, chemical and biological properties of freshwater ecosystems: origins and major characteristics of lakes and streams, survey of chemical and nutrient cycles in freshwater habitats and survey of biotic composition of freshwater environments. Important themes in modern freshwater ecology are considered, including energy flow, trophic structure, eutrophication and management of freshwater ecosystems.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4030

Requisites: Restricted to graduate students only.

EBIO 5060 (3) Landscape Ecology

Studies distributional patterns of communities and ecosystems, ecological processes that affect those patterns, and changes in pattern and process over time. Consideration of spatial and temporal scales in ecological analyses is required to understand and predict response to broad-scale environmental change.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4060

Requisites: Restricted to graduate students only.

EBIO 5080 (4) Freshwater Phycology

Algae are a non-monophyletic group of organisms that play critical roles in ecosystem structure and function. They have a long history of being used in a variety of ways by the human species, but are increasingly being applied to modern issues of understanding water quality and climate change, engineering at the nano scale and in the production of renewable biofuels.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4080

Requisites: Restricted to graduate students only.

EBIO 5100 (3) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology, and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4100

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 5120 (2-4) Advanced Ecology

Emphasizes specific aspects of ecology based on specialties of faculty. One or more courses are offered most semesters. Topics have included dynamics of mountain ecosystems, tundra ecology, ethnoecology, population dynamics, tropical and insular biology, ecology of fishes, quantitative plant ecology and arctic and alpine environments. May use animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 5150 (1-2) Techniques in Ecology

Emphasizes application of modern ecological techniques, such as stream biology, aquatic biology, environmental measurement and control, and techniques in geoecology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4150

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 5240 (3) Advanced Topics in Animal Behavior

Covers special areas of ethology such as sociobiology, animal communication, cognitive ethology, human ethology, moral and ethical issues.

Recommended: Prerequisite EBIO 3240.

EBIO 5270 (3) Population Genetics

Provides an in-depth introduction to population genetics. Lectures and discussions will focus on exploring how evolutionary processes shape genetic variation through time and space and how population-level evolutionary processes can be inferred from patterns of genetic variation. Following an introduction to population genetic theory, we will investigate current topics in the field.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4270

Grading Basis: Letter Grade

EBIO 5290 (4) Phylogenetics and Comparative Biology

Reviews the principles and methodology of phylogenetic inference using molecular data. Emphasizes the application of comparative approaches to hypothesis testing in evolution, ecology and medicine and provides a broad foundation in both theory and practice of phylogenetics.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4290

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

EBIO 5320 (3) Current Topics in Evolutionary Biology

Examines six major themes on contemporary evolutionary research: population genetics, natural selection and adaptation, molecular evolution, evolution and development, phylogenetic systematics, and macroevolution. Emphasizes recent primary literature and sophisticated mastery.

Requisites: Restricted to graduate students only.

EBIO 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4340 and ENVS 4340 and ENVS 5340

Recommended: Prerequisite EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

EBIO 5410 (4) Biometry

Lect. and lab. Offers a demanding, problems-oriented methods course in statistical inference procedures, assumptions, limitations, and applications emphasizing techniques appropriate to realistic biological problems. Includes data file management using interactive computing techniques.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4410

Requisites: Restricted to graduate students only.

EBIO 5420 (3) Computational Biology

Covers a wide range of techniques for simulating biological systems, developing computer programs and scripts to interact with data and making research shareable and reproducible.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4420

Grading Basis: Letter Grade

EBIO 5440 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4440 and MCDB 4441 and MCDB 5441

Requisites: Restricted to graduate students only.

EBIO 5460 (1-5) Special Topics

Familiarizes students with specialized areas of biology.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4460

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 5520 (4) Plant Systematics

Explores principles and techniques in modern plant systematics from lichens and non-vascular plants to lycophytes, ferns, gymnosperms and angiosperms. Framework is evolutionary and ecological, with emphasis on taxonomy of major lineages and families of plants. No prerequisites, but coursework in evolutionary biology, genetics, phylogenetics and/or other botany classes is strongly encouraged.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4520

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

EBIO 5570 (3) Advanced Plant Physiology

Evaluates critically various concepts underlying the functioning of plants, including current controversial topics. Emphasizes the responses of plants to various environmental factors.

EBIO 5600 (4) Evolutionary Ecology

Evaluates how interactions within species, among species and between species and the environment evolve over time. Emphasizes the development of scientific skills, including ecological, genetic and statistical tools for testing hypotheses in evolutionary ecology. Lab activities include research projects that quantify natural selection, gene flow and phenotypic plasticity in natural systems, and a semester-long class experiment examining plant dispersal.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4600

Grading Basis: Letter Grade

EBIO 5660 (4) Insect Biology

Lect. and lab. Introduction to evolution, ecology, physiology, and behavior of insects. Emphasizes how insects have solved problems, such as maintaining water balance or finding food, that are shared by all animals but for which there may be unique solutions among the insects. Agricultural and human health problems relative to entomology are discussed. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4660

Requisites: Restricted to graduate students only.

EBIO 5740 (3) Biology of Amphibians and Reptiles

Comparative morphology, taxonomy, ecology, behavior and geographic distribution of amphibians and reptiles. Uses animals and animal tissue.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4740

EBIO 5750 (4) Ornithology

Lect., lab, and field trips. Presents origin, evolution, ecology, physical and behavioral characteristics and taxonomy of orders and families of birds of North America; field work with local species emphasizing avian ecology. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4750

EBIO 5760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4760 and MUSM 5760

Requisites: Restricted to graduate students only.

EBIO 5800 (3) Critical Thinking in Biology

Lect. and discussion. Explores controversial issues, historical themes, or emerging developments in biology. Consult the EBIO Undergraduate Advising Center for current listings.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4800

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite minimum of 14 hours of EBIO course work.

EBIO 5820 (1) Graduate Writing Seminar

Enhances writing proficiency, using graduate writing projects to implement the course concepts. Offers understanding of conventions and strategies used in scientific writing to prepare students for academic and professional communication. Department enforced requisite, basic proficiency in English as a written language.

Requisites: Restricted to graduate students only.

EBIO 5840 (1-6) Independent Study (Master's Level)

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6000 (1) Seminar: Introduction to Biological Research

Discusses areas of biological research represented in EBIO. Required of all first-year graduate students in EBIO.

Requisites: Restricted to graduate students only.

EBIO 6100 (1-3) Seminar in Environmental Biology

Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6120 (1-3) Seminar in Environmental Biology

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6100

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 6200 (1-3) Seminar in Population Biology

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6210

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6210 (1-3) Seminar in Population Biology

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6200

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

EBIO 6300 (1-3) Seminar in Organismic Biology

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6440 (2) Remote Sensing Field Methods

Explores theory and practical field measurements for validation of airborne and spaceborne spectral image acquisition. Emphasizes radiative scattering properties of soil, vegetation, cryosphere, and atmosphere. Characterization and calibration of instrumentation used to measure these properties.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 6443

Requisites: Requires a prerequisite course of GEOL 4093 or GEOL 5093 (minimum grade D-).

Recommended: Prerequisite GEOL 5240.

EBIO 6840 (1-7) Independent Research (Master's Level)

Instructor consent required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 6940 (1) Master's Degree Candidate - Plan II

Instructor consent required.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

EBIO 6950 (1-6) Master's Thesis

Instructor consent required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 7840 (1-6) Independent Study (Doctoral Level)

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 8840 (1-6) Independent Research (Doctoral Level)

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EBIO 8990 (1-10) Doctoral Dissertation

Instructor consent required.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Economics (ECON)

Courses

ECON 1078 (3) Mathematical Tools for Economists 1

Teaches mathematical skills and logical thinking for use in economics.

Topics include algebra, graphs, functions, and probability. Includes many "Real world" examples and some illustrative computer assignments.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Quantitative Economics

ECON 1088 (3) Mathematical Tools for Economists 2

Continuation of ECON 1078. Teaches mathematical skills for use in economics.

Topics include derivatives, optimization and integration.

These skills are used on "real world" problems and illustrated with computer assignments. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or MATH 1081 or MATH 1300 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Quantitative Economics

ECON 2010 (4) Principles of Microeconomics

Examines basic concepts of microeconomics or the behavior and the interactions of individuals, firms and government. Topics include determining economic problems, how consumers and businesses make decisions, how markets work, and how they fail and how government actions affect markets.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Theory and History of Economic Thought
MAPS Course: Social Science

ECON 2020 (4) Principles of Macroeconomics

Provides an overview of the economy, examining the flows of resources and outputs and the factors determining the levels of income and prices. Explores policy problems of inflation, unemployment and economic growth.

Requisites: Requires prerequisite course of ECON 2010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Theory and History of Economic Thought
MAPS Course: Social Science

ECON 3070 (4) Intermediate Microeconomic Theory

Explores theory and application of models of consumer choice, firm and market organization, and general equilibrium. Extensions include intertemporal decisions, decisions under uncertainty, externalities, and strategic interaction.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 3080 (3) Intermediate Macroeconomic Theory

Introduces theories of aggregate economic activity including the determination of income, employment, and prices; economic growth; and fluctuations. Macroeconomic policies are explored in both closed and open economy models. ECON 3070 and 3080 may be taken in any order; there is no recommended sequence.

Requisites: Requires prerequisite courses of ECON 2020 and ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all min grade C-). Restricted to students with 22-180 units completed.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 3403 (3) International Economics and Policy

Examines national and supranational policies that affect the international economy, with attention to trade barriers, economic nationalism and regionalism, international political economy, exchange market intervention, and international transmission of economic perturbations. Credit given in this course is not included in the calculation of an economics major GPA. May not be taken after either ECON 4413 or ECON 4423.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: International Trade and Finance

ECON 3535 (3) Natural Resource Economics

Integrates economic analysis with life science aspects of natural resource systems to develop social policies for use of natural resources. Studies economists' approaches to resources policy analysis and applies them to energy, forestry, fisheries, mineral and water systems. Credit given in this course is not included in the calculation of an economics major GPA.

Equivalent - Duplicate Degree Credit Not Granted: ECON 4535

Requisites: Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Natural Resources and Environmental Economics

ECON 3545 (3) Environmental Economics

Highlights causes of excessive environmental pollution and tools for controlling it through economic analysis, values of preservation and distribution of costs and benefits from environmental protection programs. Credit given in this course is not included in the calculation of an economics major GPA.

Equivalent - Duplicate Degree Credit Not Granted: ECON 4545

Requisites: Requires prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Natural Resources and Environmental Economics

ECON 3616 (3) Employment, Wages and the Future of Work

Examines how automation, globalization and information technology are changing which jobs get done, by whom and how much they pay. Illustrates how basic labor supply and demand theory helps predict the impact of technological progress on occupational composition, income inequality and the nature of work itself. These theoretical tools also guide our search for appropriate public policy responses. Credit given in this course is not included in the calculation of an economics major GPA.

Requisites: Requires a prerequisite course of ECON 2010 (minimum grade C-). Economic (ECON) majors are excluded from taking this course. ECON minors are allowed to enrolled.

Additional Information: Departmental Category: Labor and Human Resources

ECON 3784 (3) Economic Development and Policy

Introductory course in Economic Development, designed for non-majors. Students are introduced to the major issues in development economics. Explores empirical, theoretical and policy issues in economic development. Emphasis is placed on the controversial issues in this literature, requiring students to explore competing, and often conflicting, perspectives of these issues.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 2020 (all minimum grade C-). Economic (ECON) majors are restricted from taking this course. ECON minors are allowed to enrolled.

Additional Information: Departmental Category: Economic Development

ECON 3818 (4) Introduction to Statistics with Computer Applications

Introduces statistical methods and their applications in quantitative economic analysis.

Requisites: Requires prerequisite courses of ECON 2010 and 2020 and either ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 or APPM 1350 (all minimum grade C-). Restricted to students with 22-180 units completed.

Additional Information: Departmental Category: Quantitative Economics

ECON 4050 (3) Market Design

Develops foundations for the modern market design practices. Economists are increasingly involved in studying and designing practical market mechanisms. Includes topics such as designing efficient matching markets (students to schools, doctors to hospitals), designing auction mechanisms (Google, Facebook, government) and designing market platforms (eBay, Amazon).

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 4060 (3) Choice Theory and Economic Ethics: Good, Bad and Happiness

Critiques how economists model and judge behavior. How we judge is contrasted with other moral philosophies. Economists assume individuals behave in their own best interests. What does this mean and is it true? Looks at research from psychology and neuroscience. Quizzes and a multi-step research paper, designed for students who love to question, research, write and rewrite.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

Recommended: Prerequisite ECON 3080.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 4070 (3) Topics in Microeconomics

Studies utility maximization under uncertainty, risk, game theory, moral hazard, and adverse selection. Applications include insurance markets and the theory of contracts.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 4111 (3) Money and Banking Systems

Discusses money, financial institutions and the monetary-financial system in a modern economy.

Requisites: Requires prerequisite course of ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Money and Banking

ECON 4211 (3) Public Economics: the Economics of the Government Sector

Focuses on taxation and public expenditures. Topics include economic rationale for government action, economic theory of government behavior, and effects of government policies on allocation of resources and distribution of income.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Public Economics

ECON 4221 (3) Political and Public Choice Economics

Explores decision-making in non-traditional market settings, specifically political market settings, using economic models. We investigate policy outcomes as the product of interactions among individuals in political markets, and analyze how governmental decisions are the result of rational optimizing behavior, even if they do not lead to policies that maximize national welfare.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Public Economics

ECON 4231 (3) Applied Economic Analysis and Public Policy

Applies economic analysis to current issues of public policy. Reviews basic public finance and economic justifications for government action. Examines structure and procedures of Colorado State Legislature. Chooses current legislative issues, reviews relevant economic literature and applies implications through briefing papers and testimony at legislative hearings. Explores the challenges of integrating informed economic analysis into legislative process.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Public Economics

ECON 4242 (3) Urban Economics: The Economics of Cities

Considers the economic forces which drive households and jobs to congregate in metropolitan areas. It then considers the forces within the city which determine how the established cities "look" - how rents vary with location, the distribution of jobs and households within a city, urban sprawl, and the sorting of households between neighborhoods. Finally it considers some government policies relating to land use and housing.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Urban and Regional Economics

ECON 4292 (3) Migration, Immigrant Adaptation, and Development

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4292 and GEOG 5292

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Urban and Regional Economics

ECON 4309 (3) Economics Honors Seminar 1

For information consult the department's director of honors. Open only to qualified seniors.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course
Departmental Category: Independent Study and Other Courses

ECON 4339 (3) Economics Honors Seminar 2

For information consult the department's director of honors. This course does not count toward major requirements.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 4413 (3) International Trade

Focuses on theories of international trade and its impacts on economic welfare. Analyzes commercial policy, including tariffs, non-tariff barriers, retaliation, regional integration, and factor migration.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: International Trade and Finance

ECON 4423 (3) International Finance

Covers balance of payments; foreign exchange market, income, trade, and capital flows; asset markets adjustment mechanisms; stabilization policies in an open economy; and problems of international monetary systems.

Requisites: Requires prerequisite course of ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: International Trade and Finance

ECON 4504 (3) The New Institutional Economics: Institutions, Contracts and Economic Outcomes

Understand the conceptual tool kit of the New Institutional Economics. The concepts include transaction costs, property rights, credible commitment, and most importantly the roles of formal and informal institutions. We will examine the impact of institutions on contracting and organizations. The goal is to understand how the underlying institutions determine the degree to which societies improve their economic performance.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080, and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Economic History

ECON 4514 (3) Economic History of Europe

Covers evolution of modern economic growth and development in Europe, emphasizing institutional change.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Economic History

ECON 4524 (3) Economic History of the United States

Evolution of modern economic growth and development in the U.S. from colonial times to the present emphasizing institutional change.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-).

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Economic History

ECON 4534 (3) Chinese Economic History in Comparative Perspective

Surveys the economic history of China in a comparative perspective, to understand the history of economic development in China in terms of existing economic theories of growth. The approximate timeline is from the 18th century to the 20th century.

Recommended: Prerequisite ECON 3070.

Additional Information: Departmental Category: Economic History
Departmental Category: Asia Content

ECON 4535 (3) Natural Resource Economics

Analysis of problems associated with socially optimal use of renewable and nonrenewable natural resources over time. Problems of common property resources, irreversible forms of development, and preservation of natural areas.

Equivalent - Duplicate Degree Credit Not Granted: ECON 3535

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 4545 (3) Environmental Economics

Examines the effects of economic growth on the environment; application of economic theory of external diseconomies, cost-benefit analysis, program budgeting, and welfare economics to problems of the physical environment.

Equivalent - Duplicate Degree Credit Not Granted: ECON 3545

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 4555 (3) Transportation Economics and Policy

Provides an overview of the characteristics and structure of transportation markets including aggregate demand, vehicle and mode choice, surface freight and air travel. Explores market failures in the transportation sector including market power and externalities such as pollution, congestion and accidents as well as policies aimed at addressing these issues.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 4616 (3) Labor Economics

Examines the influence of markets, unions, and government on labor allocation and remuneration. Analyzes human capital, discrimination, mobility and migration, productivity, unemployment, and inflation. Compares outcomes under competition with those in a world marked by shared market power and bargaining.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Labor and Human Resources

ECON 4626 (3) The Economics of Inequality and Discrimination

Examines the unique insights available through economic analysis regarding the causes, mechanisms, and consequences of inequality and discrimination. Examines the extent of inequality, the varieties and extents of discrimination, and explores the economic models that suggest explanations.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Labor and Human Resources

ECON 4646 (3) Topics in Health Economics

Growth in health expenditures worldwide over the past three decades has led to an increase in research in health economics and its importance in public policy in developed and developing countries. The purpose of this course is to encourage students to read, think, and do research on issues in health economics. This course will cover issues that are pertinent to the US, other developed and developing countries. It will cover the basics of health economics such as health production functions and the role for government as well as touching on topical issues such as health care reform.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Recommended: Prerequisite ECON 3818.

Additional Information: Departmental Category: Labor and Human Resources

ECON 4697 (3) Industrial Organization and Regulation

Explores neoclassical theory of the firm, the determinants of industrial structure, and the purposes and institutions of public policy to control or maintain a competitive environment.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4717 (3) Economics of Entrepreneurship

Introduces economic analysis of entrepreneurship, its financing, performance and public policy issues. We will investigate in depth the business of venture capital and start-ups. Aims to understand both academic and practical implications from the burgeoning literature on economics of entrepreneurship and private equity.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4774 (3) Economic Reform in Developing Countries

Explores competing paradigms of economic development, emphasizing the confrontation between the structuralist/dirigiste paradigm and the neoclassical public choice paradigm. Analyzes economic reforms under way in developing countries, including stabilization policy and structural adjustment. Also explores political reforms, including the pluralist revolution and the design of a constitutional framework in developing societies.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Economic Development
Departmental Category: Asia Content

ECON 4784 (3) Economic Development

Explores empirical, theoretical, and policy issues in economic development. Examines topics with reference to the developing countries: income distribution and poverty, demographic change, labor force employment and migration, human capital, physical capital, natural resources and the environment, industrial structure, international trade, and finance.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Economic Development
Departmental Category: Asia Content

ECON 4794 (3) Economic Growth

Introduces theories explaining why differences in standards of living among countries are so large. Examines a variety of data on historical experiences of economic growth. Surveys recent research on why some countries are so rich and some are so poor, and why some countries grow so quickly and others grow so slowly.

Requisites: Requires prerequisite course of ECON 3070 or ECON 3080 (minimum grade C-).

Additional Information: Departmental Category: Economic Development

ECON 4797 (3) Antitrust and Regulation

Explores two major branches of Industrial Organization—antitrust and regulation. Focus is on developing qualitative and quantitative skills for the legal-economic analysis of issues and problems across a variety of industries. Case studies are used to illustrate concepts, including mergers, collusive agreements, monopolization, and networks. Individual and group projects help develop advocacy and public speaking skills.

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4808 (3) Introduction to Mathematical Economics

Introduces the use of mathematics in economics. Topics include vectors and matrices, differential calculus, and optimization theory, with economic applications.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4818 (3) Introduction to Econometrics

Provides undergraduate economics majors with an introduction to econometric theory and practice. Develops the multiple regression model and problems encountered in its application in lecture and individual applied projects.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4838 (3) Microcomputer Applications in Economics

Teaches basic concepts in Java programming applied to economic models. Development of Web pages and dynamic modeling will be introduced. Students will gain a foundation that can be applied to creating advanced applications relating to analysis of statistical data and custom projects.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4848 (3) Applied Econometrics

Introduces students to the practice of applied regression analysis. Summarizes and reviews the regression technique, explores U.S. census data sources, introduces an advanced statistical software package and provides structured exercises in regression analysis of census data. Concludes with independent research projects analyzing social and economic issues using regression analysis and census data.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4858 (3) Financial Econometrics

Introduces statistical models, estimation and testing procedures used in analyzing financial data for advanced undergraduates. Topics include the modeling of returns, portfolio theory, the capital asset pricing model, options pricing and fixed income securities.

Requisites: Requires prerequisite course of ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (minimum grade C-).

Recommended: Prerequisite ECON 4818.

Additional Information: Departmental Category: Quantitative Economics

ECON 4868 (3) Simulation Modeling in Microeconomics

Computer simulation modeling translates theory into computer code to examine questions numerically; for example, the effects of taxes or emissions permits on welfare and income distribution. We use GAMS (general algebraic modeling system); a version may be downloaded for free. Students must have access to a computer (not needed in the classroom).

Requisites: Requires prerequisite course of ECON 3070 (minimum grade C-).

Additional Information: Departmental Category: Quantitative Economics

ECON 4897 (3) Economics of Organizations

Introduces students to the economic analysis of relationship between firms and incentives within firms. The first part covers classical theories of firm boundaries and contractual relationship between firms. The second part focuses on compensation and incentive issues within firms.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3818 or APPM 4520 or APPM 4570 or CHEN 3010 or CVEN 3227 or MATH 4520 (all minimum grade C-).

Additional Information: Departmental Category: Industrial Organization

ECON 4909 (3-4) Independent Study

Department enforced prerequisites: completion of at least 12 hours of ECON classes and a minimum GPA of 3.00. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of ECON 2010 and ECON 2020 and ECON 3070 or ECON 3080 (all minimum grade C-).

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 4929 (3) Special Topics In Economics

This course number is assigned to upper-level Economics electives that become available on an incidental basis. Refer to the Economics Department for a detailed description of current content. Formerly ECON 4999.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 (all minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Independent Study and Other Courses

Departmental Category: Asia Content

ECON 4939 (2-6) Internship/Seminar

Offers students the opportunity to integrate theoretical concepts of economics with practical experience in economics-related institutions. The theoretical portion arises from seminars and readings, the practical from activities in organizations related to the economics field. A maximum of 3 credit hours counts toward major requirements. Department consent required.

Requisites: Requires prerequisite courses of ECON 3070 and ECON 3080 and ECON 3818 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Economic (ECON) majors or minors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 7010 (3) Microeconomic Theory 1

Analyzes recent and contemporary literature on fundamentals of economic theory. Considers value theory with particular emphasis on methodology, theory of demand, theory of the firm, game theory, theory of distribution, general equilibrium theory, and welfare economics. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7020 (3) Macroeconomic Theory 1

Discusses behavior of consumption, investment, employment, production, and interest rates in the context of dynamic optimization models. Also considers government, economic growth, and business cycles. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7030 (3) Microeconomic Theory 2

Continuation of ECON 7010. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7040 (3) Macroeconomic Theory 2

Presents the theoretical and empirical application of dynamic macro programming models. Topics include consumption, investment, labor, money, and credit theories. Covers the theory of economic fluctuations and business cycles employing dynamic general equilibrium models. Instructor consent required.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7050 (3) Advanced Economic Theory

Discusses advanced topics in game theory and general equilibrium. Department enforced prerequisites: ECON 7010 and ECON 7030 and ECON 7818 and ECON 7828.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 7818 (3) Mathematical Statistics for Economists

Provides the mathematical foundation for Ph.D. level statistical inference in economic research. The primary topics of the course are probability theory and mathematical statistics including hypothesis testing and classical estimation with an emphasis on the method of maximum likelihood. Instructor consent required.

Additional Information: Departmental Category: Quantitative Economics

ECON 7828 (3) Econometrics

Continuation of ECON 7818. Topics include regression analysis and extensions of the linear regression model to generalized least squares, time series data, and systems of equations. Instructor consent required.

Additional Information: Departmental Category: Quantitative Economics

ECON 8010 (3) Economics of Risk and Time

Focuses on new techniques for analyzing behavior in relation to risk and time.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Theory and History of Economic Thought

ECON 8020 (3) Business Cycle Theory and Monetary and Fiscal Policy

Discusses monetary and non-monetary theories of business cycles in the light of empirical evidence and what those theories imply for monetary and fiscal policy. Emphasizes a deep understanding of the mechanisms within models, their comparative statics and comparative dynamics and the importance of, and evidence for, difference parameter values within business cycle models.

Requisites: Restricted to graduate students only.

ECON 8209 (3) Economics Research Methods Workshop 1

Assists students starting their doctoral thesis by discussing methodology and evaluation of economic research. Presents and discusses student research proposals.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 8211 (3) Public Economics: Fundamental Principles

Presents the fundamental principles of public goods, externalities, public choice, excess burden, optimal taxation, and tax incidence.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Economics

ECON 8219 (3) Economics Research Methods Workshop 2

Continuation of ECON 8209. Assists students starting their doctoral thesis by discussing relevant economic research. Presents and discusses research papers.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 8221 (3) Public Economics: Topics in Public Expenditures and Taxation

Explores advanced topics in public economics such as decentralization, state and local government, program analysis, taxation, international tax issues, political economy issues, and market failure.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Economics

ECON 8231 (3) Local Public Economics

Examines subnational governments and systems of governments, the effects of inter-governmental competition, appropriate tax and expenditure responsibilities, and variations in governing institutions. Covers congestible public goods, Tiebout mechanisms, and tax capitalization.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Economics

ECON 8413 (3) Seminar: International Trade Theory

Covers theories of comparative advantage, including the classical, factor-proportions, fixed-factor, and noncompetitive markets models. Examines trade policy including trade barriers, market distortions, strategic policy, regional integration, political economy, and factor migration.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Trade and Finance

ECON 8423 (3) Seminar: International Finance

Highlights foreign exchange markets, past and current international monetary mechanisms, and processes of adjustment. Examines the role of international financial markets for the behavior of consumption, investment, saving, and production. Also considers international transmission of business cycles.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Trade and Finance

ECON 8433 (3) Seminar: Topics in Money and International Economics

Explores advanced work in various aspects of international economics, such as empirical trade analysis, public choice, and interactions between real and monetary phenomena in the world economy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Trade and Finance

ECON 8534 (3) Economic History of North America

Examines North America's past from the perspective of economics. Topics include growth and welfare in the colonial period; staple products, agricultural development, and the emerging industrialism in the antebellum period; transformation of the North American economy to 1914; the interwar years and the Great Depression; and economic integration since 1945.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic History

ECON 8535 (3) Environmental Economics I

Considers the allocation of society's scarce environmental resources and government attempts to achieve more efficient and equitable allocations. It is a course in applied welfare economics with an emphasis on market failure and valuation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 8545 (3) Environmental Economics II

Provides advanced study of recent advances in environmental economics and explores opportunities for new research. Topics vary with interests of instructor and students.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Natural Resources and Environmental Economics

ECON 8676 (3) Seminar: Labor Economics 1

Focuses on the demand side of labor markets. Topics include standard static and dynamic models of labor demand, labor market discrimination, composition of compensation, labor hierarchies within enterprises, unionization, efficient contracts, and macroeconomics of labor markets.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Labor and Human Resources

ECON 8686 (3) Seminar: Labor Economics 2

Focuses on special topics in labor economics: dynamic theories of labor supply, employment, and unemployment; labor supply in a household framework; and labor market activity and income distribution. Explores both theoretical models and empirical tests in each area.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Labor and Human Resources

ECON 8747 (3) Industrial Organization Theory

Highlights economics of regulation of industry and markets, industry studies, and the application of lab methods to industrial organization.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Industrial Organization

ECON 8757 (3) Industrial Organization and Public Policy

Addresses the theory of interaction of firms within markets and industries, emphasizing importance of the number, relative size of firms, market institution, firm strategies and nature of consumer demand.

Examines neoclassical and game theoretic models, empirical industry studies and laboratory tests of theoretical models and policies.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Industrial Organization

ECON 8764 (3) History of Economic Development

Covers in historical perspective the causes of economic development including why some areas develop faster than others and why development occurs more rapidly in some eras than others.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic History
Departmental Category: Asia Content

ECON 8774 (3) Seminar in Transition Economies

Focuses on the problems encountered in countries evolving from planned to market economies. Emphasizes applications of new and traditional models of economic growth and analysis of problems unique to formerly planned economies.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic Development

ECON 8784 (3) Economic Development

Explores empirical, theoretical and policy issues in economic development. Examines political economy, income distribution and poverty, demographic change, labor force employment and migration, human capital, physical capital, natural resources and the environment, industrial structure, international trade and finance, stabilization policy and structural adjustment.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Economic Development

ECON 8828 (3) Seminar: Econometrics 1

First semester of two-semester sequence in econometrics for PhD students. Studies least squares and generalized least squares estimation of linear econometric models. Asymptotic (large sample) theory of inference. Some topics in the estimation of microdata.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8838 (3) Seminar: Econometrics 2

Teaches the advanced level of econometrics theory. Topics include asymptotic theory, maximum likelihood estimation, limited dependent variables analysis and other frontier areas of econometrics such as the method of moment estimation, semiparametric and nonparametric estimation procedure.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8848 (3) Applied Microeconometrics

Presents a "user's guide" to conducting empirical research in applied microeconomics. Begins with a primer on an industry-standard econometric software package including programming techniques and data management. Introduces advanced econometric techniques including panel data methods, IV, matching models, regression discontinuity and limited dependent variables models. Concludes with a research project requiring a replication and/or extension of an existing published paper

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8858 (3) Computational and Structural Estimation Methods

Teaches students to construct a variety of applied economic models, obtain parameter values through calibration or estimation techniques and uses the resulting models to conduct policy simulations.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Quantitative Economics

ECON 8909 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Independent Study and Other Courses

ECON 8999 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Independent Study and Other Courses

Education (EDUC)

Courses

EDUC 1500 (1) Success Strategies in Higher Education

Introduces students to learning theories and a range of college success strategies to deepen their engagement with their academic work.

Students will learn metacognitive practices to identify the values and aims driving their academic ambitions and craft their most successful path through their undergraduate experience.

Repeatable: Repeatable for up to 2.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Education

EDUC 1580 (3) Energy and Interactions

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1580

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: General Education

EDUC 2020 (1) Step 1: Inquiry Approaches to Teaching

Invites science, mathematics and engineering students to explore teaching as a career by providing first-hand experiences teaching science/math lessons in local elementary classrooms. Introduces theory and practice necessary to design and deliver excellent instruction. Master teachers provide ongoing support and feedback. Meets weekly on CU campus (1.5 hours/week) and involves five visits to an elementary school.

Requisites: Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, AS Open Option majors, College of Engineering majors, Education minors, EDEL, EDMU, EDEN, EDMA, EDSC, EDSS, EDFR, EDGR, EDLT, EDRO or EDSP majors only.

Additional Information: Departmental Category: General Education

EDUC 2025 (1) Step 1: Inquiry Approach to Teaching in Informal Settings

Invites science, mathematics and engineering students to explore teaching and learning in informal K-12 environments. Introduces theory and practice necessary to design and deliver excellent instruction. Meets weekly on CU campus (1.5 hours/week) and requires participants to work a minimum of five hours with K-12 students at STEM-related special events such as science fairs, after school programs, and science camps.

Requisites: Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, College of Engineering majors, or Education minors only.

Additional Information: Departmental Category: General Education

EDUC 2030 (1-2) Step 2: Inquiry-Based Lesson Design

Builds on EDUC 2020 and further develops lesson design and inquiry-based teaching practice. Offers opportunity to explore teaching career and learn about middle school culture. Master teacher provides support as students design and deliver lessons in middle school classrooms.

Emphasizes assessment of student learning. Meets weekly on CU campus (1.5 hours/week) and involves five visits to a local middle school.

Requisites: Prereq course of EDUC 2030 (min grade C-). Rstr to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, AS Open Option majors, ENGR majors, EDUC minors, EDEL, EDMU, EDEN, EDMA, EDSC, EDSS, EDFR, EDGR, EDLT, EDRO or EDSP.

Additional Information: Departmental Category: General Education

EDUC 2050 (1) Step into Humanities Teaching

Invites students in humanities and social sciences to explore teaching as a career by providing first-hand experiences working with children.

Introduces theory and practice for the design of text-based, equity-focused instruction. Students receive support and feedback from experienced educators. Meets weekly on CU campus (1.25 hours/week). Requires additional time at a practicum site.

Additional Information: Departmental Category: General Education

EDUC 2125 (3) History of American Public Education

Provides an overview of the history of American education by exploring major reforms efforts from the common school movement to "Nation at Risk." Examines what intellectuals were thinking about public schools and what ordinary people experienced in them. Assesses how differences in race/ethnicity, class, gender, and power shaped public schools.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: General Education

EDUC 2150 (3) Education in Film

Provides opportunities to view and analyze how facets of education are represented (or misrepresented) in film. Considers narratives constructed about education and how those stories fuel popular conceptions of and assumptions about students, teachers, and schools. Examines how issues of race, class, and gender are embedded in how films represent schools, teachers, students, and communities.

Additional Information: Departmental Category: General Education

EDUC 2400 (3) Cultural Diversity and Awareness

Enhances students' self-awareness in a variety of educational and cultural settings. Investigates self within a cultural context, inviting students to engage more deeply with their cultural assumptions and lenses, as well as the cultural practices and beliefs of other distinct groups. Explores themes relating to diversity through works of fiction, cultural contexts, contemplative practices, poetry, music and experiential activities.

Additional Information: Departmental Category: General Education

EDUC 2625 (3) Teaching English as a Second Language

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

Additional Information: Departmental Category: General Education

EDUC 2800 (1-3) Special Topics

Designed to meet needs of students with topics of interest.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: General Education

EDUC 2910 (1-3) Field Practicum 1

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2920.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 2919 (3) Renewing Democracy in Communities and Schools

Examines curriculum theory, K-12 reform, and the concepts of citizenship, democracy, power, and diversity through classroom discussion and participation in a school-based Public Achievement program. Students will dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

Equivalent - Duplicate Degree Credit Not Granted: INVS 2919

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General Education

EDUC 2920 (1-3) Field Practicum 2

Offers supervised campus and off-campus experiences tied to course work in the INVST program. See also EDUC 2910.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 3013 (3) School and Society

Introduces students - both future teachers and those simply interested in education - to pressing issues surrounding education within the United States. The course reveals the complex relationship between schools and the larger society of which they are a part. Examines issues of diversity and equity from different disciplinary lenses, including history, philosophy, sociology and anthropology.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Contemporary Societies

Departmental Category: General Education

EDUC 3570 (3) Learning With Technology In and Out of School

Examines ways digital media are changing the way young people learn, play, make friends, and participate in civic life. Studies widely implemented digital tools intended to support literary, math, and science learning of children ages 4-18. Involves brief internship (5 hours outside class) and design projects that integrate these tools to transform in either a classroom or after-school program.

Additional Information: Departmental Category: General Education

EDUC 3621 (1-3) Art for the Elementary Teacher

Introduces elementary education students to art education. Introduces many visual art techniques, art media and processes used in art education. Includes hands-on studio art experiences in a format that supports subjects such as literature, writing, music and social studies. Emphasizes the role of art education and materials in supporting the artistic development and visual literacy of children. Department enforced prerequisite: completion of 30 hours of course work.

Requisites: Restricted to School of Education (EDUC) undergraduates only

Additional Information: Departmental Category: Elementary Education

EDUC 4015 (3) International / Comparative Education

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace corps and Volunteer Agencies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5015

Additional Information: Departmental Category: General Education

EDUC 4023 (3) Differentiating Instruction in Diverse Secondary Classrooms

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices and programmatic interventions that support student learning. Includes practicum.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4351

Requisites: Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4050 (3) Knowing and Learning in Mathematics and Science

Explores current theories of learning in mathematics and science at the secondary level. This course focuses on learners' opportunities to learn mathematics and science in a classroom context from the perspective of different theoretical orientations. Students examine their own assumptions about learning, and critically examine the needs of a diverse student population in the classroom.

Requisites: Restricted to AMEN, ASTR, BCHM, CHEM, EBIO, GEOL, IPHY, MATH, MCDB, PHYS, GEEN, NRSC, Arts and Sciences Open Option majors, College of Engineering majors, or Education minors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4060 (3) Classroom Interactions

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts.

Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5060

Requisites: Restricted to School of Education (EDUC), Mathematics-Secondary Education (EDMA) or Science-Secondary Education (EDSC) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4112 (3) Educational Psychology and Adolescent Development

Analyzes fundamental concepts from psychology and the learning sciences to understand how educators can support youth development in and out of school. Includes service learning requirement.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4114

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Secondary Education

EDUC 4125 (3) Secondary World Language Methods

Presents and discusses issues in secondary school curriculum, instruction, and classroom management as they play out in world language classroom. Examines, analyzes, and evaluates a variety of teaching strategies, their effectiveness for students, and teacher dispositions to facilitate learning. Includes in-school experiences.

Requisites: Restricted to EDEN, EDFR, EDGR, EDIT, EDJP, EDLT, EDMA, EDMU, EDSC, EDRU, EDSP, EDSS or MMED majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4135 (3) Story and Memoir

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5135

Additional Information: Departmental Category: Secondary Education

EDUC 4161 (1-3) Children's Literature

Addresses reading and evaluation of books, children's, interests, authors and illustrators, folk literature, multicultural literature, modern fanciful tales, and trends.

Additional Information: Departmental Category: General Education

EDUC 4222 (3) Language Study for Educators

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5222

Additional Information: Departmental Category: General Education

EDUC 4232 (3) Language and Literacy across the Curriculum

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5235

Requisites: Restricted to undergraduate Science-Secondary Education (EDSC) or Mathematics-Secondary Education (EDMA) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4295 (4) Reading and Literacy in the Secondary Classroom

Examines ways in which adolescents develop literacy through reading, writing, speaking, viewing, and listening. Students learn to plan and organize literacy instruction based on ongoing assessment, to draw on and develop learner's linguistic skills related to reading, to support learner's reading comprehension skills, and to support their learning through oral language development.

Requisites: Requires a corequisite course of EDUC 4342 or EDUC 5345.

Restricted to undergraduate English - Secondary Education (EDEN) or English - Secondary Education (EDSS) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4311 (3) Children's Literature and Literacy Engagement in Elementary Schools

Focuses on teaching children's literature in elementary schools & youth organizations. Participants will understand theoretical and developmental processes associated with literary learning, methods for teaching literature in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

Requisites: Restricted to Elementary Education (EDEL) or Education (EDUC-MIN) students only.

Additional Information: Departmental Category: Elementary Education

EDUC 4312 (3) Perspectives on Science

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5315

Additional Information: Departmental Category: General Education

EDUC 4318 (3) The Nature of "English Language Arts"

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for 21st century literacies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5318

Additional Information: Departmental Category: General Education

EDUC 4320 (3) Reading Instruction for Elementary Schools

Participants will engage theories and processes of literacy learning, reading development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of print and multimodal literacy practices embedded in reading instruction in elementary classrooms.

Requisites: Requires corequisite course of EDUC 4321. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4321 (3) Writing Instruction for Elementary Schools

Participants will engage theories and processes of literacy learning, writing development, and equity-oriented teaching. Students will learn, develop, and enact instructional strategies and lessons to support all students' successful participation in a range of multimodal literacy practices embedded in writing instruction in elementary classrooms.

Requisites: Requires corequisite course of EDUC 4320. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4331 (3) Elementary Social Studies Methods

Prepares teacher education candidates for teaching social studies in a social justice and equity context. Participants will understand theoretical and developmental processes associated with social studies learning, culturally responsive teaching pedagogy in social studies, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards.

Requisites: Requires corequisite courses of EDUC 5215 and EDUC 4341. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4341 (3) Elementary Reading Assessment and Instruction

Builds on knowledge and teaching practices introduced in EDUC 4320. Addresses five critical components of reading. Refines understanding of research-based practices for diagnostic assessments and intervention, and teaching strategies for elementary age learners. Prepares candidates to deliver a comprehensive reading curriculum in the elementary grades.

Requisites: Requires corequisite courses of EDUC 4331 and EDUC 5215. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4342 (3) Writing in Humanities Classrooms

Fosters understandings of diverse students' writing processes and the development of a repertoire of research-based teaching practices. Emphasizes writing as a tool for both developing and communicating understandings across a range of settings.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5345

Requisites: Requires a corequisite course of EDUC 4295 or EDUC 5295. Restricted to English - Secondary Education (EDEN) or English - Secondary Education (EDSS) majors only.

Additional Information: Departmental Category: Secondary Education

EDUC 4351 (3) Differentiating Instruction in Diverse Elementary Classrooms

Focuses on differentiating and individualizing instruction for elementary school students including culturally, linguistically and ability diverse students. Includes theoretical and practical orientations to planning instruction and assessment as well as providing information regarding teachers' and families' legal rights and responsibilities. Includes hands-on experiences in elementary school settings.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4023

Requisites: Requires corequisite course of EDUC 5205. Restricted to Music (EDMU) Education majors or Elementary (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 4411 (3-4) Educational Psychology for Elementary Schools

Integrates theories and ideas from elementary school child development, educational psychology and the learning sciences. Explores theories of learning and child development and considers implications for teaching, student engagement and the design of equitable and effective learning environments. Students are required to attend a practicum off-site for this class.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: General Education

EDUC 4425 (3) Introduction to Bilingual/Multicultural Education

Provides a comprehensive survey of bilingual-multicultural education programs for language minority students. Includes an overview of the history and legislation related to bilingual education and English as a second language. Presents various models, philosophies, and theoretical underpinnings of bilingual education and ESL.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5425

Additional Information: Departmental Category: General Education

EDUC 4460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 5460 and PHYS 4460 and PHYS 5460

Requisites: Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 4513 (2) Education and Practice

Meets during student teaching assignment. Includes topics of concern to teachers, such as classroom organization and management, lesson planning, assessment, preparation of edTPA, etc.

Requisites: Requires corequisite course of EDUC 4691 or 4712 or 4722. Restricted to EDEL, EDEN, EDFR, EDGR, EDJP, EDLT, EDMA, EDRU, EDSC, EDSP or EDSS majors only.

Additional Information: Departmental Category: General Teacher Education

EDUC 4610 (2-3) Math and Science Education

Introduces learning theory and teaching practices for mathematics and science learning assistants. Presents theoretical issues such as conceptual development, questioning techniques, cooperative learning, nature of math/science and argumentation in mathematics and science. Department enforced prerequisite: students admitted to the Learning Assistant program.

Additional Information: Departmental Category: General Education

EDUC 4691 (10) Student Teaching: Elementary School 1

Kindergarten through sixth grades. Department enforced prerequisite: completion of all education and content-specific arts and sciences requirements, and passing required licensure exam.

Requisites: Requires corequisite course of EDUC 4513. Restricted to Elementary Education (EDEL-LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4712 (10) Student Teaching: Secondary School

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

Requisites: Requires corequisite course of EDUC 4513. Restricted to EDEN, EDJP, EDLT, EDMA, EDRU, EDSC or EDSS (LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4716 (3) Basic Statistical Methods

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

Additional Information: Departmental Category: General Education

EDUC 4722 (5) Student Teaching: Secondary School 2

Student teacher apprentices in a middle/junior high or senior high school. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

Requisites: Requires corequisite course of EDUC 4513. Restricted to EDFR, EDGR or EDSP (LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4732 (4-12) Student Teaching K-12

Required experience for music students seeking education at both elementary and secondary levels. Department enforced prerequisites: completed all education and content-specific music courses and passed required licensure exam.

Requisites: Requires corequisite course of MUSC 4193. Restricted to EDMU (LICU or LICG) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 4742 (9) Student Teaching: Secondary for Engineers

Student teacher apprentices in a middle/junior or senior high school. Must be admitted to a secondary teacher education program in English, Japanese, Latin, math, Russian, science or social studies. Department enforced prerequisites: completed all education and content-specific arts and sciences courses and passed required licensure exam.

Requisites: Requires a prerequisite course of EDUC 4513 or EDUC 4050 (minimum grade C-). Restricted to EDMA or EDSC majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Secondary Education

EDUC 4800 (1-9) Special Topics

Designed to meet needs of students with topics of pertinent interest.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 4810 (1-9) Special Topics

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 4811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 6811 and MCDB 4811 and MCDB 5811

Additional Information: Departmental Category: Graduate Education

EDUC 4822 (3) Teaching and Learning Chemistry

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology, and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

Requisites: Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

Additional Information: Departmental Category: General Education

EDUC 4831 (3) Advanced Peer Education

Second semester of an academic year's training for students interested in peer counseling. Expand upon what you learned in ARSC 2274. Focus on presentations, leadership, and group facilitation. Basic group leadership, facilitation theory, and technique taught. Co-create and co-lead your own small groups/presentations for other CU students. Offered only spring semesters.

Requisites: Requires prerequisite course of ARSC 2274 (minimum grade D-).

Additional Information: Departmental Category: General Education

EDUC 4833 (3) Teaching and Learning Earth Systems

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). Focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions, and developing effective discourse within and outside the classroom.

Requisites: Requires prerequisite course of ATOC 1060 or ENVS 1000 or GEOL 1010 or GEOL 1020 or GEOL 1060 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Teacher Education

EDUC 4840 (1-4) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Education

EDUC 4910 (3) Peer Counseling Practicum

Controlled enrollment. Credit given for peer counseling activities. Students are selected to participate in this class and act as peer counselors or TAs for the peer counseling training. Repeatable up to 9 total credit hours.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: General Education

EDUC 4912 (1) Practicum in Teacher Education

Provides in-school practicum experience.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Teacher Education

EDUC 5005 (3) Advanced Social Foundations of Education

Critically examines the intellectual and political forces that shape the aims, policies, and practices of K-12 education in the United States.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5015 (3) International / Comparative Education

Comparatively studies education in other countries, emphasizing its role in developing nations, with an emphasis on successful models in basic literacy, primary education, secondary curriculum and teacher education. Analyzes political, social and economic policies and ideologies for their relevance to the development process, including the role of international organizations: World Bank, UNICEF, UNESCO, Peace Corps and Volunteer Agencies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4015

Additional Information: Departmental Category: Graduate Education

EDUC 5035 (3) Proseminar: Parent and Community Involvement

Focuses on models and strategies for improving parent and community involvement in the schools. Discusses administrative concerns, such as parent advisory councils, and instructional concerns, such as helping children with school assignments.

Additional Information: Departmental Category: Graduate Education

EDUC 5060 (3) Classroom Interactions

Students design and implement instructional activities informed by what it means to know and learn mathematics and science, and then evaluate the outcomes of those activities on the basis of classroom artifacts.

Students examine how content and pedagogy combine to make effective teaching. Students are required to work in a classroom 4 hours per week.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4060

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5065 (3) Curriculum Theories

Examines four central curricular traditions: progressive; conservative; radical; and spiritual. Highlights the strengths and weaknesses of various writers within each tradition with attention paid to the conceptual features and the practical implications of each educational view.

Encourages students to examine their own educational assumptions.

Additional Information: Departmental Category: Graduate Education

EDUC 5070 (3) Spirituality and Religion in Education

Examines features of religion, spirituality, and a liberal arts education, so as to further understand the constitutional, historical and cultural constraints on, and acceptable approaches to the study of religion and spirituality in American education. Specifically explores aspects of a contemplative orientation and the degree to which such an orientation should/can be pursued in K-12 public and higher education.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5075 (3) Sociology in Education

In-depth analysis of theories and concepts in sociology and education. Evolution of curriculum, organization, and enrollment characteristics of American schools. Schooling, race, class, culture, gender, stratification, and educational reform in light of paradigmatic change in theories and concepts of sociology.

Additional Information: Departmental Category: Graduate Education

EDUC 5085 (3) History of American Education

Highlights social and intellectual history perspectives of American educational history, major reform movements from the 19th century to Dewey, and assessment of how differences of race, class, ethnicity, religion, power, and gender affected American education.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5105 (3) Teaching for Understanding and Equity

Addresses perspectives and evidence-based teaching practices that promote equity and access to conceptual understanding. Introduces the knowledge base on effective and socially just teaching practices, and the theories and research that support these practices. Explores the impact of theory and research on classroom instruction.

Additional Information: Departmental Category: Graduate Education

EDUC 5115 (3) Issues in School Change and Reform

Examines recent developments in teaching, and trends in the philosophy and practice of education. Focuses special attention on a variety of issues central to school reform.

Additional Information: Departmental Category: Graduate Education

EDUC 5135 (3) Story and Memoir

Explores narrative theory and the epistemological/stylistic commitments of stories as the basis for writing memoir, as well as for studying the written and spoken memoirs of others. We use the word memoir to mean a story of "how one remembers one's own life." Introduces and discusses narrative theory and selected memoirs. Students engage in reflection on their own narrative-making processes and evaluate their practical and analytic understanding of daily narrative practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4135

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5145 (3) Gender, Literacy, and the K-12 Classroom

Explores and critiques various conceptions of gender within popular and scholarly publications that have influenced how gender and sexual diversity is approached in classrooms. Builds a theoretical stance toward gender and sexual diversity that supports equity, engagement and achievement for all children and youth. Discusses teaching strategies that thoughtfully take into account gender identities and equity.

Additional Information: Departmental Category: Graduate Education

EDUC 5165 (3) Children's Literature

Involves reading and evaluation of picture books, and emphasizes children's interests, authors and illustrators, multicultural literature, the components of narrative, and the features of illustrations. Examines connections between children's literature and children's development as writers.

Additional Information: Departmental Category: Graduate Education

EDUC 5205 (3) Elementary Mathematics Theory and Methods

Provides pre-service teachers opportunities to explore contemporary theories of learning, curriculum development, and pedagogical strategies pertaining to teaching elementary-level mathematics. Blends exploration in mathematical content with development of sophisticated mathematical models for teaching.

Requisites: Requires corequisite course of EDUC 4351. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 5215 (3) Elementary Science Theory and Methods

Provides pre-service elementary teachers opportunities to explore contemporary theories of learning, curriculum development, pedagogical strategies, and assessment. Blends scientific content, pedagogy, and practical applications.

Requisites: Requires corequisite courses of EDUC 4331 and 4341. Restricted to Elementary Education (EDEL) majors only.

Additional Information: Departmental Category: Elementary Education

EDUC 5222 (3) Language Study for Educators

Focuses on the nature of linguistic development and performance. Examines works that reflect a range of scholarly approaches to language study, explores language use both in and out of school, takes up the relationships between language practices and power and considers implications for classroom teaching.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4222

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5235 (3) Language and Literacy Across the Curriculum

Explores the relationship between language and learning in math and science classrooms with the goal of developing teaching practices that engage students in using language as a tool for understanding and constructing meaning across the curriculum. Explores how language/literacy take on different forms and functions in different social contexts and academic disciplines.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4232

Requisites: Restricted to EDCI, EECD, EFPP, EPSY or REME graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5245 (3) Foundations of Reading Instruction K-12

Comparatively analyzes current and emerging philosophies and programs in K-12 with focus on teaching reading and thinking skills.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5255 (3) Digital Literacies and New Media

Engage in digital reading and writing experiences using tools for communication, collaboration, design and research. Students will discuss and critically reflect on the role of technology in literacy instruction, grounded on learning and literacy theories. Connections to English language arts include genre study of literary and nonfiction texts and using quality children's literature as mentor texts for multimodal craft.

Requisites: Requires a prerequisite course of EDUC 5245 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Education

EDUC 5265 (3) Processes in Writing

Examines processes writers use from early ages to maturity by investigating current research related to writing curriculum, instruction, and policy. Includes opportunities for students to engage in inquiry related to writing curriculum and instruction in K-12 classrooms.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5275 (3) Assessment in Literacy

Assumes an interactive model of reading and supports the perspective of assessment as interrelated with curriculum and instruction; examines principles that guide the selection and interpretation of assessment strategies and tools, with a focus on students who are experiencing difficulties with literacy.

Requisites: Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5285 (3) Reading Clinic Procedures K-12

Focuses learning on a select group of K-12 students to assess reading proficiency, develop appropriate instructional goals, and provide instruction that addresses these goals. Emphasis on interpreting assessment data, extending a repertoire of instructional strategies, and developing and implementing a strong instructional plan.

Requisites: Requires a prerequisite course of EDUC 5275 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5295 (4) Reading and Literacy in the Secondary Classroom

Examines ways in which adolescents develop literacy through reading, writing, speaking, viewing and listening. Students learn to plan and organize literacy instruction based on ongoing assessment, to draw on and develop learner's linguistic skills related to reading, to support learner's reading comprehension skills and to support their learning through oral language development. Includes a school-based practicum experience.

Requisites: Requires a corequisite course of EDUC 4342 or EDUC 5345. Restricted to EDCI majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5315 (3) Perspectives on Science

Explores contemporary ideas and issues in the history, philosophy and sociology of science education and science, science as a social and cultural activity and how contemporary issues in science relate to and impact educational practice.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4312

Additional Information: Departmental Category: Graduate Education

EDUC 5316 (3) Nature of Social Studies and Social Studies Education

Prepares teacher education candidates for teaching social studies in a social context. Participants will understand theoretical and developmental processes associated with social studies learning, methods for teaching social studies in a diverse society, and the integration of classroom instruction with the Colorado Academic Content Standards that foster such processes.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI), Social Studies-Secondary Educ. (EDSS), Anthropology (ANTH), Economics (ECON), Geography (GEOG), History (HIST) or International Affairs (IAFS) majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5317 (3) Perspectives on Mathematics

Explores the historical development of mathematics as a human construct, and the relationship between the discipline and the contemporary school mathematics curriculum. Focuses on the sociology of mathematics education and how cultural traditions and societal needs influence the school mathematics curriculum and educational practice.

Additional Information: Departmental Category: Graduate Education

EDUC 5318 (3) The Nature of "English Language Arts

Considers historical and ongoing controversies concerning the nature of "English" as an academic field of study and of "English Language arts" as a school subject. Integrates understandings of subject-matter specialization, of approaches to teaching this contested subject, and of the diverse learners that teachers seek to prepare for the 21st century literacies.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4318

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5325 (3) Teaching Literature in Middle and Secondary Schools

Provides teachers of English with background and experiences relevant to using reading, writing, and a range of other classroom social languages to teach literature to a culturally and intellectually diverse population of students. Explores relevant literary theories, texts, and genres, and examines contemporary and historical perspectives on the meaning and function of stories in both personal and democratic public life.

Requisites: Restricted to Educ-Curriculum Instruction (EDCI), English - Secondary Education (EDEN), or Social Studies-Secondary Educ.(EDSS) majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5345 (4) Writing in Humanities Classrooms

Fosters understandings of diverse students' writing processes and the development of a repertoire of research-based teaching practices. Emphasizes writing as a tool for both developing and communicating understandings across a range of settings.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4342

Requisites: Requires a corequisite course of EDUC 4295 or EDUC 5295. Restricted to EDCI majors only.

Additional Information: Departmental Category: Graduate Education

EDUC 5355 (3-4) Methods and Materials in Secondary Social Studies

Focuses on curriculum, materials, methods, assessment, and related aspects of instruction. Introduces best practices in teaching the social studies in middle and high schools. Examines the Colorado Academic Content Standards.

Requisites: Requires a prerequisite course of EDUC 4295 or EDUC 5295 and EDUC 5325 (all minimum grade C-). Restricted to Educ-Curriculum Instruction (EDCI) or Social Studies-Secondary Educ (EDSS) majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5365 (3-4) Methods and Materials in Secondary English

Focuses on curriculum, materials, methods, and assessment. Introduces best practices in the teaching of English in middle and high schools. Examines the Colorado Academic Content Standards.

Requisites: Requires a prerequisite course of EDUC 4295 or EDUC 5295 and EDUC 5325 (all minimum grade C-). Restricted to Educ-Curriculum Instruction (EDCI) or English - Secondary Education (EDEN) majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5375 (3-4) Problem-Based Math Instruction

Focuses on curriculum, materials, methods and assessment, and related aspects of instruction. Introduces best practices in teaching mathematics in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

Requisites: Restricted to EDCI, EDSC, or EDMA majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5385 (3-4) Problem-Based Science Instruction

Focuses on curriculum, materials, methods, assessment, and related aspects of instruction. Introduces best practices in teaching science in middle and high schools. Students are required to work in a classroom 4 hours per week. Examines the Colorado Academic Content Standards.

Requisites: Restricted to EDCI, EDSC, or EDMA majors only.

Recommended: Corequisite EDUC 4023.

Additional Information: Departmental Category: Graduate Education

EDUC 5425 (3) Introduction to Bilingual/Multicultural Education

Provides a comprehensive survey of bilingual-multicultural education programs for language minority students. Includes an overview of the history and legislation related to bilingual education and English as a second language. Presents various models, philosophies, and theoretical underpinnings of bilingual education and ESL.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4425

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5435 (3) Materials and Methods in Bilingual/ Multicultural Education

Provides an in-depth study of the curriculum options available for bilingual and ESL programs. Presents, reviews, and critiques specific methods and strategies for teaching language to minority students. Gives the opportunity to develop and present teaching units in Spanish or in ESL methodology, as appropriate.

Requisites: Requires a prerequisite course of EDUC 5425 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5445 (3) Curriculum for Multicultural Education

Analyzes curriculum programs and examines principles that inform innovation for education of diverse students at all school levels. Includes topics of ethnic, racial, socio-economic, linguistic, and gender diversity.

Additional Information: Departmental Category: Graduate Education

EDUC 5455 (3) Literacy for Linguistically Different Learners

Presents current and emerging philosophies and methods on teaching reading to culturally diverse second-language learners. Includes review of materials, strategies for teaching reading and writing skills, and important considerations for transference from L1 to L2 reading.

Requisites: Requires a prerequisite course of EDUC 5425 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4460 and PHYS 4460 and PHYS 5460

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5465 (3) Introduction to ESL/Bilingual and Special Education

Provides students with the fundamental information of ESL, bilingual and special education, including theories, assumptions, philosophies, and paradigms of bilingual and special education. Discusses successful teaching techniques and instructional approaches, including individualization, least restrictive environment, transition, and career education.

Additional Information: Departmental Category: Graduate Education

EDUC 5485 (3) Differentiation in the Classroom

Focuses on teaching culturally and linguistically diverse students, special education students, and differentiation in the classroom. Emphasizes evidence-based teaching practices, programmatic interventions that support student learning and using research to inform practice. Includes practicum. Department enforced prerequisite: restricted to MA+ students.

Additional Information: Departmental Category: Graduate Education

EDUC 5505 (3) Education of Students with Learning and Behavior Disorders

Discusses unique learning needs of students with learning and behavior disorders. Emphasizes development of a systems model for diagnosis, programming, and remediation. Stresses data-based individualization of instruction, with emphasis on intervention in inclusive learning environments and developing a culturally responsive system.

Additional Information: Departmental Category: Graduate Education

EDUC 5515 (3) Curriculum and Assessment for Special Learners

Emphasizes assessment of special education students from pre-referral through staffing and placement, including response to intervention, research-based assessment practices, analytic teaching and assessment, curriculum-based assessment and measurement. Selection, administration, and interpretation of formal and informal assessment devices are studied, with particular emphasis on cultural relevance and equity in assessment for special learners with mild to severe needs.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5525 (3) Research Issues in Special Education

Provides practical experience in the review, critique, conceptualization, and writing of research studies in special education. Also offers experience in design of evaluation systems for classroom practice.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5535 (3) Diagnostic Testing in ESL and Bilingual Education

Promotes critical uses of assessment instruments and information. Provides methods for educators to incorporate assessment as a meaningful activity in the classroom intended to support learning among bilingual students. Examines effectiveness, validity, and fairness in the testing of linguistically diverse populations. Provides first-hand experiences developing, selecting, reviewing, and adapting test materials as critical to making informed teaching decisions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5545 (3) Strategies for Teaching Students with Special Needs

Provides teachers with specific evidence-based methods and techniques for teaching students with a wide variety of high and low disabilities including learning and language disabilities, hearing and visual impairments, physical disabilities, and health impairments. Emphasizes different teaching methods, instructional materials, and learning strategies that have proven effective working students with cognitive learning needs.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5555 (3-4) Practicum in Bilingual/Special Education

Offers supervised field experience in elementary and secondary special education class settings. Each credit hour requires 50 contact hours.

Requisites: Requires prerequisite courses of EDUC 5465 and EDUC 5505 and EDUC 5515 or EDUC 5545 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5575 (1-4) Workshop in Curriculum and Instruction

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 5580 (3) Physics and Everyday Thinking

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physics content focuses on interactions and energy.

Additional Information: Departmental Category: Graduate Education

EDUC 5595 (1-4) Practicum in Linguistically Different: English as a Second Language

University supervised, school-based field experience teaching linguistically different students, as well as assistance in the completion of EECD portfolio.

Requisites: Requires prerequisite courses of EDUC 5425 and EDUC 5435 and EDUC 5535 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5605 (3) Research Issues in Bilingual Education

Offers practical experience in the review, critique, conceptualization, and writing of research studies in bilingual/ESL education. Provides experience in the design of classroom evaluation systems.

Requisites: Requires a prerequisite course of EDUC 5245 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5610 (1-3) Math and Science Education

Introduces learning theory and teaching practices for mathematics and science learning assistants. Presents theoretical issues such as conceptual development, questioning techniques, cooperative learning, nature of math/science, and argumentation in mathematics and science.

Additional Information: Departmental Category: Graduate Education

EDUC 5615 (3) Second Language Acquisition

Presents a broad survey of second-language acquisition research. Stresses theoretical concerns and research findings and practical applications to teaching second languages. Gives special emphasis to second-language acquisition.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5625 (3) Methods of Teaching English as a Second Language

Exposes students to strategies used to teach English as a second or foreign language. Covers both theoretical and applied aspects of language learning and teaching. Exposes students to techniques, activities, strategies and resources to plan instruction for students learning English as a second language. Emphasizes oral language development, literacy and content-area instruction for teaching K-12 students.

Recommended: Prerequisite EDUC 5615.

Additional Information: Departmental Category: Graduate Education

EDUC 5635 (3) Education and Sociolinguistics

Explores the discipline of sociolinguistics, the study of language variation and use, and its application within education settings. Not designed as an advanced sociology or linguistics course. Areas of study include language variation, speech communities, the ethnography of communication, speech and social identities, and sociolinguistic research related to teaching and learning.

Additional Information: Departmental Category: Graduate Education

EDUC 5706 (3) Assessment in Mathematics and Science Education

Examines purposes and practices of assessment in mathematics and science education. Particular attention is given to application of theoretical foundations and contemporary research in the design and use of assessment techniques and tools to support teaching for student understanding. Addresses the role of effective formative assessment in teaching and learning.

Additional Information: Departmental Category: Graduate Education

EDUC 5716 (3) Basic Statistical Methods

Introduces descriptive statistics including graphic presentation of data, measures of central tendency and variability, correlation and prediction, and basic inferential statistics, including the t-test.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5726 (3) Introduction to Disciplined Inquiry

Considers various research approaches and methodologies included in education including experimental and quasi-experimental methods; anthropological and case study methods; evaluative research and field studies; correlational; and sociological, historical, and philosophical research. Topics include library research, research criticism, research design, and proposal writing.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 5810 (3) Teaching K-12 Mathematics: Number Sense

Provides teachers opportunity to explore fundamental mathematical theories and pedagogical perspectives pertaining to the teaching and learning of number and operation. Engages students in explorations of mathematical content underlying number and operations, while highlighting relevant problem solving, reasoning and proof, and mathematical connections. Explores implications of teachers' mathematical learning on their classroom teaching. Develops practices supporting learner's number sense development.

Additional Information: Departmental Category: Graduate Education

EDUC 5820 (3) Teaching K-12 Mathematics: Algebraic Thinking

Uses reform-based mathematics curricula to engage participants in algebraic thinking, to reflect on their own knowledge of algebraic concepts, and to examine pedagogical ideas that can foster K-12 students' algebraic thinking and learning. Algebraic topics include patterning, variable, functions, multiple representations, equality, and solving linear and systems of equations.

Additional Information: Departmental Category: Graduate Education

EDUC 5822 (3) Teaching and Learning Chemistry

Explores issues related to how people learn and teach chemistry. Reviews high school and early college chemistry concepts both from the content and pedagogical perspectives. Delves into the chemistry education research, education, psychology and cognitive science literature. Provides an opportunity to observe and/or teach K-12 or college chemistry classes.

Requisites: Requires prerequisite course of CHEM 1133 or CHEM 2100 or CHEM 1371 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 5830 (3) Teaching K-12 Mathematics: Geometry & Measurement

Provides an opportunity to explore how to foster geometric thinking while examining fundamental mathematical theory underlying the content area of geometry and measurement. Emphasizes investigative approach involving problem solving, reasoning, connections, and communication as well as learning mathematics content in a flexible and conceptual way. Challenges participants to apply their understanding to teaching practices that foster geometric thinking in K-12 learners.

Additional Information: Departmental Category: Graduate Education

EDUC 5833 (3) Teaching and Learning Earth Systems

Learn and develop pedagogically effective strategies for teaching and understanding Earth Science concepts. Particular emphasis is placed on understanding the importance of geoscience habits of mind (i.e. spatial/temporal reasoning, multiple working hypotheses, geographic context). The course focuses upon inquiry and evaluation of evidence, the importance of background knowledge and misconceptions and developing effective discourse within and outside the classroom.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Education

EDUC 5840 (3) Teaching K-12 Mathematics: Probability & Statistics

Focuses on teaching probability, data analysis, and statistics in K-12 classrooms. Explores curriculum and assessment strategies in the areas of probability and statistics. Examines research on students' thinking on stochastic tasks and how this research informs teaching practice. Emphasizes deepening of one's conceptual understanding of probability and statistics and their importance in the current information age.

Additional Information: Departmental Category: Graduate Education

EDUC 6210 (3) Education Policy and the Law

Approaches education policy issues through the rich history of litigation and current legal challenges facing American K-12 schooling. Builds an understanding of the legal and policy development of the American schooling system, particularly in the 20th century. Laws and legal cases will be used as jumping-off points for broader discussions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6220 (3) Gender Issues in Education

Provides a strong foundation in the various issues of gender and sexual diversity in education. Stimulates explorations into the ways the construct of "gender" affects and is affected by the educational system and process. Presents theory and research about contemporary educational issues related to sexism and homophobia. Encourages development of well-considered views about the various issues, research, and theories.

Additional Information: Departmental Category: Graduate Education

EDUC 6230 (3) Ethics in Education

Investigates controversies in education from a self-consciously ethical perspective, drawing as appropriate from moral and political theory as well as law. Focuses on public education's role in fostering democratic citizenship and providing equal educational opportunity. Critically evaluates various education reform policies and curriculum policies. Applies method commonly used in medical ethics to make decisions regarding concrete ethically problematic cases.

Additional Information: Departmental Category: Graduate Education

EDUC 6250 (3) Higher Education in the United States

Examines major issues in higher education focusing on the sociopolitical contexts in which US universities operate as gatekeepers to opportunities. Topics include the purposes and history of higher education in the United States, college teaching and learning, finance and governance, issues of access and equity related to race, gender, sexual orientation, gender identity, immigration status and class, and student life.

Grading Basis: Letter Grade

EDUC 6318 (3) Psychological Foundations of Education

Introduces students to theoretical and empirical contributions of educational and developmental psychology and the learning sciences emphasizing applications to educational practices. Topics include learning, development, cognitive processes, social and cultural context, motivation, assessment and individual differences.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6325 (3) Culture and Ethnography in Education

Applies anthropological perspectives to research in educational settings. Focuses on theories of culture, cultural transmission and acquisition, and cultural reproduction and production for understanding schooling and its outcomes.

Additional Information: Departmental Category: Graduate Education

EDUC 6328 (3) Advanced Child Growth and Educational Development

Introduces students to recent theoretical and research advances in the study of children and adolescent's cognitive, social and emotional development, with an emphasis on implications for learning in and out of school.

Additional Information: Departmental Category: Graduate Education

EDUC 6368 (3) Adolescent Psychology and Development for Teachers

Examines current theory and research on adolescent development, learning, motivation, and academic achievement. Emphasizes how theory and research can inform instructional decisions in the secondary classroom.

Requisites: Restricted to English-Secondary Education (EDEN), Social Studies-Secondary Educ (EDSS), Mathematics-Secondary Educ (EDMA) or Science-Secondary Educ (EDSC) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6504 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Department enforced prerequisite: graduate standing or at least one upper-division course in computer science, linguistics, philosophy, or psychology.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and LING 6200 and PHIL 6310 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6505 (1-2) Readings and Research in Cognitive Science

Interdisciplinary reading of innovative theories and methodologies of cognitive science. Share interdisciplinary perspectives through in-class and online discussion and analysis of controversial texts and of their own research in cognitive science. Required for joint PhD in cognitive science.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6506 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and LING 7415 and PHIL 7415 and PSYC 7415 and SLHS 7418

Requisites: Requires prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-). Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

Additional Information: Departmental Category: Graduate Education

EDUC 6516 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and LING 7425 and PHIL 7425 and PSYC 7425 and SLHS 7428

Requisites: Requires prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6804 (1-4) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its evaluation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4811 and MCDB 4811 and MCDB 5811

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 6844 (1-4) Master's Independent Study

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6855 (1-4) Independent Study in Curriculum and Instruction---Master's Level

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6877 (1-4) Independent Study in Educational Equity & Cultural Diversity: Master's Level

An independent study may be established between a student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6888 (1-4) Independent Study in Educational and Psychological Studies---Master's Level

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6899 (1-4) Independent Study in Educational Foundations Policy & Practice--Master's Level

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6915 (1-4) Practicum in Curriculum and Instruction

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6916 (1-4) Practicum in Research and Evaluation Methodology

Additional Information: Departmental Category: Graduate Education

EDUC 6917 (1-4) Practicum in Educational Equity and Cultural Diversity

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6918 (1-4) Practicum in Educational and Psychological Studies

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6919 (1-4) Practicum in Educational Foundations Policy and Practice

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6925 (1-4) Readings in Curriculum and Instruction

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6926 (1-4) Readings in Research and Evaluation Methodology

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6927 (1-4) Readings in Educational Equity and Cultural Diversity

Five times per semester our faculty and PhD students gather to explore topics that are relevant to becoming a scholar and researcher in our field. All EECDD PhD students are encouraged to attend; however, for first and second year PhD students attendance is required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6928 (1-4) Readings in Educational and Psychological Studies

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6929 (1-4) Readings in Educational Foundations Policy and Practice

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 6944 (1-3) Master's Degree Candidate

Repeatable: Repeatable for up to 12.00 total credit hours.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Graduate Education

EDUC 6954 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 6964 (3) Capstone: Inquiry in the Content Areas

Supports students in using and building on the ideas and content encountered in previous coursework. Requires students to conceptualize, design and implement an original research project that will serve as exit requirement for the degree. Reads and engages in research and theory associated with Teacher Research (i.e. research conducted by teachers for professional purposes).

Requisites: Restricted to Educ-Curriculum Instruction (EDCI) graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7015 (3) Teaching Internship in Teacher Education

One-semester teaching internship in an undergraduate or graduate foundations course.

Additional Information: Departmental Category: Graduate Education

EDUC 7055 (3) Philosophy of Education

Examines exemplars of educational philosophy from ancient times to the present day, emphasizing their relevance and application to current controversies in education (e.g., free speech, multiculturalism, and affirmative action). Formerly EDUC 5055.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7105 (3) Collaboration to Meet Special Needs

Covers effective collaboration practices involving the special education teacher, other educational personnel, students, and parents. Bilingual special education considerations in collaboration will be described. Issues regarding inclusion will be explored. Practical application to teaching and learning will be made. Strategies for disseminating information and collaborative activities will be discussed.

Additional Information: Departmental Category: Graduate Education

EDUC 7316 (3) Intermediate Statistical Methods

Studies sampling theory and inferential statistics; advanced applications for testing of hypotheses regarding central tendency, variability, proportion, correlation, and normality; chi-square and the analysis of frequency data; multiple regression and prediction; introduction to the analysis of variance; and related computer programs for statistical analysis.

Requisites: Requires prerequisite course of EDUC 5716 (minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7326 (3) Quasi-Experimental Design in Causal Inference in Social Sciences

Focuses on experimental and quasi-experimental designs in educational research; applications of the general linear model; power and statistical efficiency; randomization and control; multiple comparisons; factorial experiments and interaction with fixed-factor and mixed design; analysis of covariance; effects of assumption violations; and related computer programs for statistical analysis.

Additional Information: Departmental Category: Graduate Education

EDUC 7336 (3) Methods of Survey Research and Assessments

Examines theory and techniques involved in each stage of survey research, including problem formulation, questionnaire development, interview and mailed surveys, assessing reliability and validity, sampling plans, data reduction (e.g., factor analysis), and analysis of continuous and categorical data.

Requisites: Requires prerequisite courses of EDUC 5726 and EDUC 7316 (all minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7346 (3) Ethnographic Methods in Educational Research

Explores the history of ethnography and its translation into educational research. Students practice participant observation, interviewing, journal writing, artifact searches, qualitative analysis and interpretation, and styles of reporting.

Requisites: Requires a prerequisite course of EDUC 6325 (minimum grade C-).

Additional Information: Departmental Category: Graduate Education

EDUC 7376 (3) Theory and Practice of Educational and Psychological Measurement

Introduces theories of measurement and applications, and presents classical test theory. Includes quantitative concepts, methods, and computational techniques for the development, application, and evaluation of measurement instruments in social/ behavioral science and education.

Requisites: Requires prerequisite course of EDUC 5716 (minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7386 (3) Educational Evaluation

Builds an understanding of the range of approaches taken by educational evaluators, focusing particularly on the evaluation of programs. Explores the nature of different evaluation perspectives and how these disparate views translate into methodological and conceptual models. Students develop a familiarity with the most common and influential approaches to evaluation.

Additional Information: Departmental Category: Graduate Education

EDUC 7396 (3) Categorical Data Analysis

Introduces contemporary advanced multivariate techniques and their application in social science research. Methods include multivariate regression and analysis of variance, structural equation models, and factor analysis. Prior experience with Anova and multiple regression is assumed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7416 (3) Seminar: Research Methodology

Presents selected topics for advanced study in educational research, statistics, measurement, and evaluation.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 7436 (3) Item Response Theory

Includes one-, two-, and three-parameter logistic models for dichotomously-scored items and partial credit models for polychotomously-scored items; applications of the models to problems such as equating of test forms, test design, computerized adaptive testing, and the detection of item bias.

Requisites: Requires prerequisite courses of EDUC 7316 and EDUC 7376 (all minimum grade D-).

Additional Information: Departmental Category: Graduate Education

EDUC 7446 (3) Seminar: Policy Issues in Education

Explores major policy issues confronting U.S. education and examines the nature and undertaking of educational policy studies. Learn to approach policy issues from a contextual perspective that highlights systemic forces and analyzes and applies differing policy instruments. While a wide variety of policies are covered in the course, it particularly emphasizes issues of educational equity.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 7456 (3) Multilevel Modeling

Covers in depth two advanced multivariate models common to social science research: latent variable (structural equation) models and multilevel (hierarchical) models. Topics may be taught with a particular analytic context, such as measurement of change (longitudinal analysis) or experimental design.

Additional Information: Departmental Category: Graduate Education

EDUC 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and LING 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8014 (3) Advanced Seminar in Democracy, Diversity and Social Justice

Addresses the sociopolitical context of multiculturalism and education, and the sociocultural context of learning. Examines critical issues involved in making schooling responsive to an increasingly multicultural and multilingual society.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of EDUC 8210 (minimum grade B-). Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8025 (3) Seminar: Curriculum Theories

Examines in depth recent developments in curriculum theory highlighting conceptual, contextual, and normative issues. Substantially explores distinct curricular traditions, corresponding conceptions of the good life along with related approaches to reason and emotion. Focuses on the works of prominent curriculum theorists.

Additional Information: Departmental Category: Graduate Education

EDUC 8045 (3) Philosophical Issues in Educational Research

Familiarizes students with important concepts and issues from the philosophy of science and, to a lesser extent, political theory and ethics; grounds such concepts and issues in the literature (often in terms of primary philosophical sources); and stimulates students to apply this material to the field of educational research in an informed way.

Requisites: Restricted to PhD students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8055 (3) Theoretical Issues in Education Policy

Provides students with an examination of the theories behind education policy analysis. Takes a thematic approach to the study of policy in order to understand how policy agendas are set; how democratic deliberation should be linked with research and policy; and the relationship between politics, media, social structures, research and policies.

Requisites: Restricted to PhD students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8125 (3) Seminar: Radical Education Theories

Examines radical analyses of schooling, based on class, gender, sexual identity and race, through which U.S. public schooling is said to maintain dynamics of oppression and domination that undermines the schools' democratic premise. Scrutinizes the conceptual framework, interpretive and explanatory adequacy, and ethical justification of radical claims.

Additional Information: Departmental Category: Graduate Education

EDUC 8135 (3) Seminar: Research on Teaching

Provides an historical perspective of research on teaching, focusing on the evolution of conceptual frameworks, research methods, and research findings. Examines substantive and methodological issues that underlie contemporary research on teaching. Explores areas of research including teacher knowledge and beliefs, teaching for understanding, understanding student thinking, motivation and volition, and classroom assessment.

Additional Information: Departmental Category: Graduate Education

EDUC 8145 (3) Seminar: Research on Teacher Education and Learning to Teach

Explores substantive and methodological issues that underlie current research on learning to teach, teacher education, and teacher professional development. Considers the learning and development of experienced and novice teachers, with an emphasis on learning to teach in ways that conform to reform-based educational ideas.

Additional Information: Departmental Category: Graduate Education

EDUC 8155 (3) Advanced Topics in Literacy Education

Examines special topics in theory and research related to literacy and literacy education. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 8165 (3) Advanced Topics in Mathematics Education

Examines special topics in theory and research related to mathematics education. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8175 (3) Advanced Topics in Science Education

Engages participants in the process of curriculum development. Principles that guide the development of curricula and learning environments are discussed as they integrate with learning theory. Participants develop and/or test specific activities in the classroom and modify them as a result. There is a particular focus on incorporating the practices of the discipline into each content-based activity.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 8210 (3) Perspectives on Classroom Teaching and Learning

Introduces students to various theoretical perspectives informing educational research and how they are employed to study teaching, learning, and policy in K-12 classrooms. Includes reading and discussion related to the assumptions, questions, methods, and findings associated with theoretical traditions within and across disciplines.

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8220 (3) Introduction to Educational Research and Policy

Introduces conceptual and empirical issues and controversies in educational research and policy. Complements other EDUC doctoral courses in quantitative and qualitative methodology.

Requisites: Restricted to PhD students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8230 (3) Quantitative Methods I

Explores the use of statistics to formalize research design in educational research. Introduces descriptive statistics, linear regression, probability, and the basics of statistical inference. Includes instruction in the use of statistical software, (e.g., SPSS.).

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8240 (3) Quantitative Methods II

Continues the exploration of research design in the social sciences, especially the evaluation of the quantitative research reported in professional journals. Introduces instances of the general linear model (both multiple regression and ANOVA) and its application to educational research.

Requisites: Requires prerequisite course of EDUC 8230 (minimum grade D-). Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8250 (3) Qualitative Methods I

Introduces students to the theory and practice of qualitative research in education. First of a two-course sequence covering research design, theoretical perspectives, and methods. Preference given to first-year doctoral students in education.

Requisites: Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8260 (3) Qualitative Methods II

Builds on EDUC 8250 to develop knowledge and skills in ethnographic and case study research. Second of a two-course sequence covering qualitative research design, theoretical perspectives, and methods.

Requisites: Restricted to EDCI, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8348 (3) Seminar: Human Development

Intensive study of selected topics in human development. The focus of the seminar will vary depending on the instructor's expertise and students' interests. Recent topics include adolescent development in social context, Vygotsky and Cultural-Historical Activity Theory, and design-based research methods. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

Additional Information: Departmental Category: Graduate Education

EDUC 8358 (3) Seminar: Human Learning

Intensive study of selected topics in human learning. The focus of the seminar will vary depending on the instructor's expertise and students' interest. Recent topics include sociocultural and social practice theories, STEM learning in and out of school. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite EDUC 6318 or EDUC 8210 or instructor consent.

Additional Information: Departmental Category: Graduate Education

EDUC 8605 (3) Research and Professional Ethics for Educational Researchers

Examines the central issues and venerable theories of philosophical ethics that have historically framed research ethics. Also examines contemporary ethical theory that emphasizes a greater attention to the social sciences. Focuses on research ethics (both research of human subjects and research misconduct), various issues of professional academic ethics, and the AERA ethical code.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8610 (3) Advanced Topics in Educational Equity and Cultural Diversity

Examines special topics in theory and research related to educational equity and cultural diversity in education. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8615 (3) Language Issues in Education Research

Examines ways in which issues of language can affect the validity of educational research. Discusses how language can be properly addressed with a multidisciplinary perspective through different stages in the process of an investigation, including design, sampling, data collection, and data analysis. Provides the conceptual basis for addressing linguistic diversity from a multidisciplinary perspective.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8710 (3) Measurement in Survey Research

Introduces students to classical test theory and item response theory. Emphasizes the process of developing, analyzing and validating a survey instrument. Focuses on developing a survey instrument with items that derive from a clearly delineated theory for the construct to be measured. Analyzes item responses and put together a validity argument to support the proposed uses of the survey.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8720 (3) Advanced Topics in Measurement

Focuses on psychometric models for measurement and their applications in educational and psychological research. Emphasizes understanding and evaluating the utility of models from item response theory (IRT). Applies and compares measurement models in the context of simulated or empirical data sets.

Recommended: Prerequisite EDUC 8710.

Additional Information: Departmental Category: Graduate Education

EDUC 8730 (3) Advanced Qualitative Data Analysis

Requires students begin semester with qualitative data already collected (from class project, pilot study, dissertation). Instructors present diverse methods of analyzing data and writing about interpretations. Instructors customize part of course to address specific topic of expertise, e.g., discourse analysis, video analysis, textual analysis, ethnographic analysis.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

EDUC 8740 (3) Advances in the Assessment of Student Learning

Focuses on theories underlying traditional and contemporary proposals for assessment of student learning, and design and research of large-scale and classroom-based methods to assess student learning. Explores intersections between large-scale and classroom assessment, although greater attention is given to issues related to classroom assessment.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8804 (3) Special Topics

Designed to meet needs of graduate students with topics of pertinent interest.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8844 (1-4) Doctoral Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8855 (1-4) Independent Study in Curriculum and Instruction: Doctoral Level

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8866 (1-4) Independent Study in Research and Evaluation**Methodology: Doctoral Level**

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8877 (1-4) Independent Study in Educational Equity and Cultural**Diversity: Doctoral Level**

An independent study may be established between a doctoral student and a tenure track faculty member if both parties are amenable. The topics, readings and assignments will vary based upon mutually agreed upon goals. The student will be responsible for obtaining and submitting the necessary paperwork from/to the Office of Student Services in the School of Education. This is a variable credit course that ranges from 1 to 4 credits. The number of credits will be determined by the professor based on the workload.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8888 (1-4) Independent Study in Learning and Human**Development: Doctoral Level**

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8899 (1-4) Independent Study in Educational Foundations Policy**and Practice: Doctoral Level**

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8935 (1-6) Internship in Curriculum and Instruction

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8936 (1-6) Internship in Research and Evaluation Methodology

Repeatable: Repeatable for up to 36.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8937 (1-6) Internship in Educational Equity and Cultural Diversity

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8938 (1-6) Internship in Learning Sciences and Human**Development**

Repeatable: Repeatable for up to 24.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8939 (1-6) Internship in Educational Foundations Policy and**Practice**

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Education

EDUC 8950 (3) Prospectus and Dissertation Writing

Provides students with ongoing opportunities to write social science research in the context of the design, analysis and data representation, development, and write-up of students' dissertation proposals and dissertations. Students will learn to expand how they think about and use evidence, clarify their ideas and arguments, and improve their writing. Students working on proposals and dissertations should enroll.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to EDCl, EECD, EPSY, EFPP or REME PhD graduate students only.

Additional Information: Departmental Category: Graduate Education

EDUC 8994 (1-10) PhD Doctoral Dissertation

Repeatable: Repeatable for up to 60.00 total credit hours.

Additional Information: Departmental Category: Graduate Education

Electrical & Computer Engineering (ECEN)

Courses

ECEN 1030 (1-4) Special Topics

Special topics class.

ECEN 1100 (1) Freshman Seminar

Introduces students to areas of emphasis with the ECE department through seminars presented by faculty and outside speakers.

Emphasizes career opportunities, professional ethics and practices, history of the profession, and resources for academic success. Several sessions promote team building and problem solving, and provide opportunities for freshmen to meet their classmates.

Additional Information: Departmental Category: General

ECEN 1310 (4) C Programming for ECE

Introduces fundamental programming concepts with engineering applications using C at a lower level of abstraction and MATLAB at a higher, application-focused level. Teaches the use of pointers, control flow, and data types. Example engineering applications include signal processing and the numerical computations. Includes a weekly computer lab session.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 1300 or CSCI 1310 or CSCI 1320

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Prerequisite APPM 1350.

Additional Information: Departmental Category: General

ECEN 1400 (3) Introduction to Digital and Analog Electronics

Introduces fundamental concepts in electrical and computer engineering such as Ohm's Law, capacitors, LEDs and 7-segment displays, transformers and rectifiers, digital logic, Fourier decomposition, frequency analysis. Lab work exposes students to commonly used instrumentation. Includes a final project. Skills in wiring, soldering and wire-wrapping are developed.

Additional Information: Departmental Category: General

ECEN 1500 (3) Sustainable Energy

Explores how energy is generated and used in today's society. Through collaborative discussion and hands-on data collection, students will analyze the engineering challenges, fundamental limits, and potential solutions to meeting our energy needs sustainably. Students will learn to analyze numerical data, estimate orders of magnitude, and apply mathematical methods in their own lives and in the ongoing energy debate. Basic algebra required.

Requisites: College of Engineering majors are excluded from this course.

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills
Departmental Category: General

ECEN 1840 (1-6) Independent Study

Provides an opportunity for freshmen to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2010 (1-5) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2020 (1-5) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2050 (1-5) Special Topics

Additional Information: Departmental Category: General

ECEN 2060 (1-5) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2250 (3) Introduction to Circuits and Electronics

Introduces linear circuit analysis and design, including OP-Amps. Presents DC networks, including node and mesh analysis with controlled sources. Analysis of RL and RC circuits for both transient and sinusoidal steady-state responses using phasors.

Requisites: Requires prerequisite course of APPM 1360 or MATH 2300 and PHYS 1120 (all minimum grade C-), and corequisite course of APPM 2360. Restricted to College of Engineering majors only.

Recommended: Prerequisite ECEN 1310 or CSCI 1300.

Additional Information: Departmental Category: General

ECEN 2260 (3) Circuits as Systems

Continues basic circuit analysis of ECEN 2250: Laplace transform techniques, transfer functions, frequency response, Bode diagrams, resonant circuits, Fourier series expansions, and convolution.

Requisites: Requires prerequisite course of ECEN 2250 (minimum grade C-). Restricted to College of Engineering students only.

Recommended: Corequisite ECEN 2270.

Additional Information: Departmental Category: General

ECEN 2270 (3) Electronics Design Lab

Provides an introduction to analysis, modeling, design, and testing of analog electronic circuits in a practical laboratory setting. The laboratory is centered around a robot platform and includes design, SPICE simulations, prototyping and testing of circuits necessary to drive and remotely control the robot.

Requisites: Requires prerequisite course of ECEN 2250 (minimum grade C-) and corequisite course of ECEN 2260. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 2350 (3) Digital Logic

Covers the design and applications of digital logic circuits, including both combinational and sequential logic circuits. Introduces hardware descriptive language, simulating and synthesis software, and programming of field programmable arrays (FPGAs).

Requisites: Requires prerequisite course of ECEN 1310 or CSCI 1300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 2410 (3) Renewable Sources and Efficient Electrical Energy Systems

Introduces electrical power generation and renewable energy, including solar, wind, micro, hydro, coal, nuclear and natural gas and some of the issues in integrating renewable energy sources in the grid.

Requisites: Requires prerequisite course of PHYS 1120 (minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 2420 (3) Electronics for Wireless Systems

Explores fundamental principles behind the operation of a radio, including a practical introduction to circuit elements. Covers the components and operation of a radio (transmitter and receiver) with simple signals. Students learn lab exercises the operation principles behind components of a complete practical radio system.

Requisites: Requires prerequisite course of PHYS 1120 and APPM 1360 or MATH 2300 (all minimum grade C-). Requires corequisite course of ECEN 2250. Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) majors only.

Additional Information: Departmental Category: General

ECEN 2440 (3) Application of Embedded Systems

Introduces embedded systems and key computer architecture concepts through a variety of projects involving programming a microcontroller in C. Provides students hands-on projects that combine the knowledge gained in their digital and analog coursework in order to engineer hardware, firmware and application software design solutions. Includes a weekly lecture and two weekly laboratory sessions.

Requisites: Requires a prerequisite course of ECEN 1310 (minimum grade C-). Requires corequisite course of ECEN 2250.

Additional Information: Departmental Category: General

ECEN 2703 (3) Discrete Mathematics for Computer Engineers

Emphasizes elements of discrete mathematics appropriate for computer engineering. Topics: logic, proof techniques, algorithms, complexity, relations, and graph theory.

Requisites: Requires prerequisite courses of ECEN 1310 or CSCI 1300 and APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to College of Engineering students only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 2830 (1-5) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 2840 (1-6) Independent Study

Offers an opportunity for sophomores to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 2841 (1-6) Independent Study

Offers an opportunity for sophomores to do independent, creative work.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 3002 (3-5) Special Topics

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 3003 (3-5) Special Topics

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3004 (3-5) Special Topics

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 3005 (2-3) Special Topics

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 3010 (3) Circuits and Electronics for Mechanical Engineers

Covers analysis of electrical circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits, and operational amplifiers. Includes introductory digital electronics and microprocessors/microcontrollers.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 3017

Requisites: Requires prereq course of PHYS 1120 (min grade C). Requires a prereq or coreq course of APPM 2360. Restricted to students with 57-180 credits (Jr or Sr) Mechanical Engr (MCEN) or Electrical Engr (ECEN) or Engineering Plus (GEEN) majors only.

Additional Information: Departmental Category: General

ECEN 3030 (3) Electrical/Electronic Circuits Non-Major

For students not majoring in electrical engineering. Covers analysis of electric circuits by use of Ohm's law; network reduction; superposition; node analysis; Thevenin's and Norton's theorems; sinusoidal signals; phasors; power in AC circuits; transient response, operation of simple circuits; rectifiers; transformers; 3-phase circuits; motors and generators.

Requisites: Requires prereq course of APPM 2360 (min grade C-).

Electrical Computer Engineering (ECEN), Electrical Engineering (EEEN), Electrical Computer Engineering and Electrical Engineering Concurrent Degree (C-ECEN/EEEN) mjrs are excluded from this course

Additional Information: Departmental Category: General

ECEN 3070 (3) Edges of Science

Examines the evidence for paranormal phenomena, reasons for skepticism, and physical models that could account for the data. Reviews controversial scientific theories that overcame barriers to acceptance, and how worldviews shift. Considers the scientific method and ways uncontrolled factors might influence experiments. Develops skills in statistical analysis of data. Includes group projects testing for anomalous and parapsychological effects. Not accepted as a technical elective for engineering majors.

Requisites: Requires prerequisite course of MATH 1011 (minimum grade C-).

Additional Information: Departmental Category: General

ECEN 3170 (3) Electromagnetic Energy Conversion 1

Real and reactive power in single phase circuits, power triangle, balanced three-phase circuits, wye and delta connections, introduction to electromagnetic machines, transformers (single and three-phase) and their equivalent circuits, AC-machinery fundamentals, synchronous generator from a magnetic field point of view, synchronous motors and condensers, three-phase induction motors, DC machinery fundamentals, DC motors, single phase motors. Matlab/Simulink will be used.

Requisites: Requires prerequisite courses of ECEN 2260 and PHYS 1120 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 3250 (3) Microelectronics

Develops a basic understanding of active semiconductor devices. Focuses on building an understanding of BJT and CMOS devices in both digital and analog applications.

Requisites: Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3300 (3) Linear Systems

Characterization of linear time-invariant systems in time and frequency domains. Continuous time systems are analyzed using differential equations and Laplace and Fourier transforms. Discrete time systems are analyzed using difference equations, Z-transforms and discrete time Fourier transforms. Sampling and reconstruction of signals using the sampling theorem. Applications of linear systems include communications, signal processing, and control systems.

Requisites: Requires prerequisite course of ECEN 2260 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3303 (3) Introduction to Robotics

Introduces students to fundamental concepts in autonomous, mobile robotics: mechanisms, locomotion, kinematics, control, perception and planning. The course consists of lectures and lab sessions that are geared toward developing a complete navigation stack on a miniature mobile robotic platform.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3302

Requisites: Requires prerequisite courses of CSCI 2270 and CSCI 2824 or ECEN 2703 or APPM 3170 or MATH 2001 (all minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3320 (3) Semiconductor Devices

Highlights the fundamentals of semiconductor materials and devices. Topics include the electrical and optical properties of semiconductors, the theory of Pn junctions, bipolar and field-effect transistors, and optoelectronic devices.

Requisites: Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3350 (3) Programming Digital Systems

Explores how computers and programmable hardware in general are used to implement digital systems by looking at the capabilities of central processing units, the use and control of various input/output (I/O) devices, memory organization, and concurrency management. Topics include computer architecture, instruction sets, I/O device programming, interrupts, data transfer mechanisms, semaphores, and memory management.

Requisites: Requires prerequisite course of ECEN 2350 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3360 (3) Digital Design Laboratory

Introduces digital system design, including system software and hardware building blocks, and system software-hardware integration. Emphasizes hands-on system development and debugging. Uses mainstream electronic system design platforms, including FPGAs, embedded and mobile computing platforms, and Assembly/C/Java/Verilog programming languages.

Requisites: Requires prerequisite course of ECEN 3350 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 3400 (3) Electromagnetic Fields and Waves

Electromagnetic fields are covered at an introductory level, starting with electrostatics and continuing with DC current, magnetostatics, time-varying magnetic fields, waves on transmission lines, Maxwell's equations and the basics of plane waves. The use of fields in inductors, capacitors, resistors, transformers, and energy and power concepts are studied.

Requisites: Requires prerequisite courses of APPM 2350, APPM 2360, PHYS 1120 and ECEN 2250 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3410 (3) Electromagnetic Waves and Transmission

Covers reflected and transmitted plane waves in layered media, Poynting's theorem of electromagnetic power, two-conductor transmission line theory and practice, Smith chart usage and impedance matching, waveguides, and elements of antenna theory.

Requisites: Requires prerequisite course ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 3810 (3) Introduction to Probability Theory

Covers the fundamentals of probability theory, and treats the random variables and random processes of greatest importance in electrical engineering. Provides a foundation for study of communication theory, control theory, reliability theory, and optics.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4510 or APPM 3570

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 3840 (1-6) Independent Study

Offers an opportunity for juniors to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 3841 (1-6) Independent Study

Offers an opportunity for juniors to do independent, creative work.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 3930 (6) ECE Co-op Education

Participate in a cooperative education program working with a corporate or government entity. Individual assignments are arranged between the department and the outside employer. Offered only through Continuing Education. Department enforced prerequisite: sophomore, junior or senior EEEN and ECEN majors and 2.85 GPA.

Repeatable: Repeatable for up to 24.00 total credit hours.

Requisites: Requires prerequisite courses of ECEN 2260 and ECEN 3350 (all minimum grade C-).

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

ECEN 4000 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 4001 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Bioengineering

ECEN 4002 (1-4) Special Topics

Credit and subject matter to be arranged. Department enforced prerequisite: varies

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4003 (1-4) Special Topics

Credit and subject matter to be arranged. Department enforced prerequisite: varies

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

ECEN 4004 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4005 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4006 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Optics

ECEN 4007 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4009 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 4011 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5011

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Bioengineering

ECEN 4012 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4013 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4016 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Additional Information: Departmental Category: Optics

ECEN 4017 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Additional Information: Departmental Category: Power

ECEN 4018 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4021 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours.
Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) College of Engineering majors only.
Additional Information: Departmental Category: Bioengineering

ECEN 4022 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4024 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Equivalent - Duplicate Degree Credit Not Granted: ECEN 5024
Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4026 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4028 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4031 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4033 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ECEN 4043 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

ECEN 4049 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.
Repeatable: Repeatable for up to 9.00 total credit hours.
Additional Information: Departmental Category: VLSI CAD Methods

ECEN 4053 (1-4) Special Topics

Special topics course.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5053

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4106 (3) Photonics

Deals with the generation, transmission, modification and detection of light. Applications include fiber optics communications, data storage, sensing, and imaging. Leads to understanding of fundamental physical principles used in the analysis and design of modern photonic systems.
Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Requires a corequisite course of ECEN 3300. Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Optics

ECEN 4116 (3) Introduction to Optical Communications

Given data rates, distance, reliability or bit error rates, the information required to specify the type of fiber, the source, the wave length, type of modulation, repeater or optical amplifiers, and detectors will be presented.

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Optics

ECEN 4120 (3) Neural Network Design

Introduces basic (artificial) neural network architectures and learning rules. Emphasizes mathematical analysis of these networks, methods of training them and application to practical problems such as pattern recognition, signal processing and control systems. Shows how to construct a network of "neurons" and train them to serve a useful function.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5120

Requisites: Requires prerequisite courses of APPM 2360 or MATH 2130 and ECEN 1310 or CSCI 1300 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: General

ECEN 4138 (3) Control Systems Analysis

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Department enforced prerequisite: background in Laplace transforms, linear algebra, and ordinary differential equations.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5138

Requisites: Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4167 (3) Electromagnetic Energy Conversion 2

Introduction to electric machine drives, basic electric machine mechanics, structure and modeling of electric machines (DC, Synchronous, Linear, Induction), reference frame theory using d-q modeling based on the complex space vector and on matrix transformation, transient and steady state analysis of three-phase machine, design of speed regulators, vector control. Matlab/Simulink will be used.

Requisites: Requires prerequisite course of ECEN 3170 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4224 (3) High Speed Digital Design

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5224

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4242 (3) Communication Theory

Covers modern digital and analog communication systems. Analysis and design of communication signals, transmitters, channels, and receivers. Amplitude and angle modulation and demodulation are treated as well as theory and application of digital data transmission. Emphasis is also placed on the analysis and mitigation of the effects of noise through signal design at the transmitter and signal processing at the receiver.

Requisites: Requires prerequisite course of ECEN 3300 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4313 (3) Concurrent Programming

Introduces the theory and practice of multicore programming. The first part of the course presents foundations of concurrent programming: mutual exclusion, wait-free and lock-free synchronization, spin locks, monitors, memory consistency models. The second part presents a sequence of concurrent data structures and techniques used in their implementations (coarse-grained, fine-grained, optimistic and lock-free synchronization).

Requisites: Requires a prerequisite course of ECEN 1310 or CSCI 1300 or CSCI 1310 (all minimum grade C-).

Grading Basis: Letter Grade

ECEN 4324 (3) Fundamentals of Microsystem Packaging

Introduction to the fundamentals of microsystems packaging. A seminar style course which surveys topics in microsystem packaging such as electrical package design, design for reliability, thermal management, multichip packaging, IC Assembly, sealing and encapsulation, and board assembly.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5324

Requisites: Requires prerequisite course or corequisite course of ECEN 3410 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4341 (3) Bioelectromagnetics

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5341

Requisites: Requires prerequisite courses of ECEN 3400 and ECEN 3810 or APPM 3570 or MATH 4510 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4375 (3) Microstructures Laboratory

Offers experience in monolithic silicon integrated circuit fabrication techniques, including IC layout, pattern compiling and generation, mask making, oxidation, photolithography, diffusion, implantation, metallization, bonding, process analysis and testing. Includes design project.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5375

Requisites: Requires prerequisite course of ECEN 3320 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 4423 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5423 and CSCI 4446 and CSCI 5446

Requisites: Requires prerequisite courses of APPM 1360 or MATH 2300 and ECEN 1310 or CSCI 1300 and PHYS 1110 (all minimum grade C-). Restricted to College of Engineering majors only.

Recommended: Prerequisites PHYS 1120 and CSCI 3656 and MATH 2130.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4517 (3) Power Electronics and Photovoltaic Power Systems Laboratory

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5517

Requisites: Requires prerequisite course of ECEN 4797 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4532 (3) Digital Signal Processing Laboratory

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5532

Requisites: Requires prerequisite course of ECEN 4632 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4553 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5523 and CSCI 4555 and CSCI 5525

Requisites: Requires prerequisite courses of ECEN 2703 and ECEN 3350 (all minimum grade C). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4555 (3) Principles of Energy Systems and Devices

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5555

Requisites: Requires prerequisite courses of ECEN 3810 or APPM 3570 or MATH 4510 and PHYS 2130 or PHYS 2170 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 4583 (3) Software System Development

Lectures deal with techniques for product requirements definition, project planning, coding, verification, validation, performance evaluation, and maintenance of medium-scale (2-3000 line) systems. Primary emphasis is on practical application of these techniques to a specified software project. Students work in teams to produce appropriate documents for each phase and are responsible for project completion according to specification and schedule. Course project is written in C on a Unix look-alike system; prior knowledge of C or Unix is not required.

Requisites: Requires prerequisite course of CSCI 2270 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4593 (3) Computer Organization

Studies computer design at the gate level. Discusses instruction set architecture design, arithmetic and logic unit design, control logic, memory design and caches, simple pipelining, I/O and peripheral devices. Briefly covers aspects of modern computer architecture, such as multicore processors and cache coherence for these.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4593

Requisites: Requires prerequisite course of ECEN 3350 or CSCI 2400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4606 (3) Undergraduate Optics Laboratory

Introduces fundamental concepts, techniques, and technology of modern optical and photonic systems. Individual labs cover particular fields of optical technology, including light sources such as lasers and Leds, interferometers, fiber-optic communications, photodetection, spectrometers, and holography. Practical skills such as how to align an optical system will also be emphasized.

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Optics

ECEN 4610 (3) Capstone Laboratory Part 1

Hands-on laboratory experience utilizing teams in the systematic proposal, design, integration, and testing of an electronic/computer based system. Results will be the prototype of a stand-alone analog/digital system. Must have completed all required Advanced Analog Core courses for major, except one course may be taken concurrently by petition. Must take ECEN 4620 to complete the sequence. Minimum required grade for this course and ECEN 4620 is C-.

Requisites: Requires prereq of ECEN 3360 either ECEN 3250 3300; or ECEN 3250 3400; or ECEN 3300 3400 (min grade C-). Restricted to Elect/Comp Engr (ECEN) or Elect Engr (EEEN) or Elect/Comp Engr or Elect Engr Concurrent Degree (C-EEEN or C-ECENEEN) mjrs only

Additional Information: Departmental Category: General

ECEN 4616 (3) Optoelectronic System Design

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5616

Requisites: Requires prerequisite course of ECEN 3400 (minimum grade C-).

Additional Information: Departmental Category: Optics

ECEN 4620 (3) Capstone Lab, Part 2

Hands-on laboratory experience for teams in the systematic proposal, design, build integration, test and documentation of an electronic/computer based system. Results will be a reliably operating, stand-alone analog/digital system, with publication quality technical documentation. Department enforced prerequisite: advanced analog core courses.

Requisites: Requires prerequisite course of ECEN 4610 (minimum grade C-). Restricted to Electrical and Computer Engineering (ECEN) or Electrical Engineering (EEEN) or ECEE concurrent (C-EEEN or C-ECENEEN) majors only.

Additional Information: Departmental Category: General

ECEN 4632 (3) Introduction to Digital Filtering

Covers both the analysis and design of FIR and IIR digital filters. Discusses implementations in both software and hardware. Emphasizes use of the FFT as an analysis tool. Includes examples in speech processing, noise canceling, and communications.

Requisites: Requires prerequisite course of ECEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4633 (3) Hybrid Embedded Systems

Introduces system hardware and design techniques for embedded and hybrid reconfigurable systems. Intended for those interested in developing projects using hardware description languages to build application-specific computing systems. Industry standards are used for design, development and debugging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5633

Requisites: Requires prerequisite courses of ECEN 3350 and ECEN 4593 (all minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4634 (3) Microwave and RF Laboratory

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5634

Requisites: Requires prerequisite course of ECEN 3410 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 4638 (3) Control Systems Laboratory

Provides experience in control system design and analysis, using both real hardware and computer simulation. Covers the entire control system design cycle: modeling the system, synthesizing a controller, conducting simulations, analyzing the design to suggest modifications and improvements, and implementing the design for actual testing.

Requisites: Requires prerequisite course of ECEN 4138 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 4643 (3) SW Engineering of Concurrent Systems

Addresses engineering of applications requiring multiple software processes running concurrently, sharing data, and communicating as a system in a single environment. Topics include performance analysis of architecture design; analysis of requirements, design and testing of synchronization and communication; the interplay of system design and performance with the impact of memory management, input/output, and file system support.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5643

Requisites: Requires prerequisite course of ECEN 4583 or ECEN 5543 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4652 (3) Communication Laboratory

Analysis and design of realistic communication signals in a modern digital signal processing environment. Covers both analog and digital communication signals with and without noise and distortion. Pulse amplitude modulation is used initially at baseband and then combined with amplitude and phase/frequency modulation to produce the kind of bandpass signals that are used in cell phones and wireless data networks.

Requisites: Requires prerequisite course of ECEN 4242 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 4653 (3) Real-Time Digital Media

Learn how to design and build Linux-based real-time system applications for digital media encode/decode and transport. Course focus is on the process as well as fundamentals of designing, coding, and testing Linux-based real-time systems often used in industry for digital media systems. Students use POSIX kernel-mapped threads and drivers to implement real-time digital media solutions.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5653

Requisites: Requires prerequisite course of ECEN 1030 or ECEN 1310 or CSCI 1300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4743 (3) SW Engineering of Distributed Systems

Addresses engineering of networked applications and self-contained embedded system products involving multiple processors. The fundamental concepts of software engineering are complicated by an application running simultaneously and asynchronously on multiple processors over a network. Topics: specification, analysis, design, and testing of distributed components including concerns of security, synchronization, transaction coordination, data replication, web services, and service oriented architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5743

Requisites: Requires prerequisite course of ECEN 4583 or ECEN 5543 or CSCI 5548 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4753 (3) Computer Performance Modeling

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5753 and CSCI 4753 and CSCI 5753

Requisites: Requires prerequisite course of CSCI 3753 (minimum grade C-). Restricted to College of Engineering majors only.

Recommended: Prerequisite a course in statistics.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 4797 (3) Introduction to Power Electronics

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5797

Requisites: Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4811 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5811 and ASEN 4216 and ASEN 5216

Requisites: Requires prerequisite course of ECEN 2260 or ECEN 3030 or ASEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4821 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5821 and ASEN 4426 and ASEN 5426

Requisites: Requires prerequisite course of ECEN 2260 or ECEN 3030 or ASEN 3300 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4827 (3) Analog IC Design

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5827

Requisites: Requires prerequisite course of ECEN 3250 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Power

ECEN 4831 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5831 and ASEN 5436

Requisites: Requires prerequisite course of ECEN 2260 or ECEN 3030 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Bioengineering

ECEN 4840 (1-6) Independent Study

Offers an opportunity for seniors to do independent, creative work. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 4841 (1-6) Independent Study

Offers an opportunity for seniors to do independent, creative work.

Repeatable: Repeatable for up to 6.00 total credit hours.

ECEN 5000 (3) Graduate Professional Seminar

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

ECEN 5005 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5008 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5009 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5011 (1-4) Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4011

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Bioengineering

ECEN 5012 (3) Special Topics

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5013 (1-4) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering

(EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

ECEN 5016 (1-4) Special Topics

Additional Information: Departmental Category: Optics

ECEN 5018 (1-4) Special Topics

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5021 (1-4) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students in Electrical Engineering

(EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Bioengineering

ECEN 5023 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering, Embedded Systems.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5024 (1-4) Special Topics

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4024

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5028 (1-4) Special Topics

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5032 (3) Special Topics

Additional Information: Departmental Category: Bioengineering

ECEN 5049 (1-4) Special Topics

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5053 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering - Embedded Engineering.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4053

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5104 (3) Computer-Aided Microwave Circuit Design

Emphasizes the design of strip-line and microstrip circuits, using a CAD package. Discusses design of impedance transformers, amplifiers, switches, phase-shifters, etc. Assignments include design of typical circuits and their analysis using a microwave circuit analysis program. Laboratory includes measurements using a network analyzer facility on a typical circuit designed and fabricated by students.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5107 (3) Electric Power Grid

Examines the electrical grid, including conventional generation, transmission/ distribution, and new renewable generation technologies. Issues including grid stability, the increase in variable generation on the grid, and how the electrical grid will change in the future will be addressed. Intended for students with an engineering background from outside electrical engineering who desire an introduction to the power grid.

Requisites: Excludes graduate students in Electrical Engineering or Electrical Engineering Concurrent degree plans.

Additional Information: Departmental Category: Power

ECEN 5114 (3) Waveguides and Transmission Lines

Intermediate course dealing with guided-wave systems at HF, microwave, and optical frequencies. Modern waveguiding structures, including circular metallic waveguides, microstrip transmission lines, and optical waveguides are treated. Additional material may include waveguide losses, excitation of waveguides, microwave network theory, coupled-mode theory, resonators, and pulse propagation in waveguides.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to EEEN or ECEN graduate students or Electrical Engineering Concurrent or Electrical/Computer Engineering Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5120 (3) Neural Network Design

Introduces basic (artificial) neural network architectures and learning rules. Emphasizes mathematical analysis of these networks, methods of training them and application to practical problems such as pattern recognition, signal processing and control systems. Shows how to construct a network of "neurons" and train them to serve a useful function.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4120

Additional Information: Departmental Category: General

ECEN 5122 (3) Wireless Local Area Networks

Examines small-scale wireless networks particularly personal and local area networks. Covers licensed and unlicensed spectrum, indoor and small-scale radio propagation, modulation techniques, network topologies, ad hoc and infrastructure networks, protocol design, TCP/IP-wireless interactions and protocol standards.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5520

Requisites: Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

Recommended: Prerequisite TLEN 5430.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5128 (3) Game Theory and Multiagent Systems

Provides an overview of game theory with a special emphasis on its application to multiagent systems, i.e., systems that are comprised of a collection of interacting and possibly competing decision making entities. Examples drawn from engineered, economics and social models, including multivehicle robotics, data networks, sensor networks and electronic commerce.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5134 (3) Electromagnetic Radiation and Antennas

Covers elementary sources and antennas, cylindrical wire antennas, loop antennas, radiation patterns and antenna gain, aperture sources such as horns and dishes, specialized antennas such as microstrip patches, linear and circular arrays, mutual coupling and ground effects, ray and numerical formulations, transmission formulas, and antenna applications.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5138 (3) Control Systems Analysis

Analysis and design of continuous time control systems using classical and state space methods. Laplace transforms, transfer functions and block diagrams. Stability, dynamic response, and steady-state analysis. Analysis and design of control systems using root locus and frequency response methods. Computer aided design and analysis. Topics covered in this course will be investigated in more depth, require external readings, additional homework will be assigned, and the exams will be more difficult.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4138

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3300.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5139 (3) Computer-Aided Verification

Covers theoretical and practical aspects of verification of finite-state systems (hardware) and infinite-state systems (programs). Model checking: temporal logics, explicit-state and symbolic search, BDDs. Constraint solvers: SAT solvers, decision procedures. Program verification: invariants, partial vs. total correctness, abstraction. Department enforced requisite: general proficiency in discrete mathematics and programming.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5135

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite CSCI 2824.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 5154 (3) Computational Electromagnetics

Provides a computational study of microwave circuits and antennas, using finite-difference, finite-element, and moment methods. Requires students to develop algorithms, write and execute programs, and prepare reports analyzing results. Circuits include waveguides, microstrip lines, and center-fed dipole antennas.

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5156 (3) Physical Optics

Covers the application of Maxwell's equations to optical wave propagation in free space and in media. Topics include polarization, dispersion, geometrical optics, interference, partial coherence, and diffraction.

Recommended: Prerequisite ECEN 3410.

Additional Information: Departmental Category: Optics

ECEN 5166 (3) Guided Wave Optics

Builds up the concepts necessary to understand guided wave optical systems. Topics include slab wave-guides, semiconductor lasers, fiber optics, and integrated optics.

Requisites: Requires prerequisite courses of ECEN 5645 and ECEN 5156 (all minimum grade C-).

Additional Information: Departmental Category: Optics

ECEN 5224 (3) High Speed Digital Design

Covers fundamentals of high-speed properties of logic gates, measurement techniques, transmission lines, ground planes and layer stacking, terminations, vias, power systems, connectors, ribbon cables, clock distribution and clock oscillators.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4224

Requisites: Requires a prereq course of ECEN 3400 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5254 (3) Remote Sensing Signals and Systems

Examines passive and active techniques for remote sensing with emphasis on fundamental noise and detection issues from radio to optical frequencies. Emphasis is placed on electromagnetic wave detection, statistical signal and noise analysis, remote sensing system architecture, and hardware for remote sensing systems. Systems studied include radiometers, radars (real and synthetic aperture), interferometers, and lidars. Applications to detection and surveillance, Earth remote sensing, astronomy, and imaging systems are covered.

Requisites: Requires prerequisite courses of ECEN 3300 and ECEN 3400. Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5264 (3) Electromagnetic Absorption, Scattering, and Propagation

Electromagnetic waves in communication, navigation, and remote sensing systems from radio to optical frequencies, including propagation in deterministic and random media. Topics include absorption and refraction by gases, discrete scattering by precipitation, clouds, and aerosols, continuous scattering by refractivity fluctuations, earth-space propagation and Faraday rotation in plasmas, and radiative transfer theory.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prereqs are ECEN 3400 and ECEN 3410.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5273 (3) Network Systems

Focusing on the design and implementation of network protocols and algorithms. Topics covered include the internet's layered protocol stack, TCP/IP, Web/HTTP, email/SMTP, DNS, Ethernet, wireless networks, secure networking. Students will learn socket-based network programming. Familiarity with C and UNIX required.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 4273 and CSCI 5273

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5274 (3) Radar Science and Techniques

Studies atmospheric radar fundamentals. Examines scattering by precipitation and atmospheric turbulence; long-wavelength radars and the dynamics of the middle and upper atmosphere; design of meteorological and clear-air radars; profiling tropospheric winds, temperature, and humidity by radar and radiometry; and ionospheric sounding using ionosondes and incoherent-scatter radars.

Requisites: Requires prerequisite course of ECEN 5254 (minimum grade C-).

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5322 (3) Search Engine & Analysis of High-dimensional Dataset

Provides students with an exposition of the novel algorithmic methods for searching and analyzing big data. The class includes a project: students design a content-based music information retrieval system similar to those used by Gracenote, Shazam, or Pandora.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5324 (3) Fundamentals of Microsystem Packaging

Introduction to the fundamentals of microsystems packaging. A seminar style course which surveys topics in microsystem packaging such as electrical package design, design for reliability, thermal management, multichip packaging, IC Assembly, sealing and encapsulation, and board assembly.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4324

Requisites: Requires a prereq course of ECEN 3410 (min grade D-).

Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5341 (3) Bioelectromagnetics

Effects of electric and magnetic fields on biological systems are described with applications to therapy and safety. The complexity of biological systems is described to provide a better understanding of the distribution of fields inside the body. Risk analysis is also introduced.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4341

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Bioengineering

ECEN 5345 (3) Introduction to Solid State Physics

Provides an introduction to the electronic, photonic and phononic properties of solid state materials and devices. Covers optical constants, free electron gas, plasmons, energy bands, semiconductors and doping, excitons, quantum wells, phonons and electrooptical effects. Makes use of quantum mechanical methods. Department enforced prerequisite: basic quantum mechanics.

Requisites: Restricted to any graduate student or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5355 (3) Principles of Electronic Devices 1

Relates performance and limitations of solid state devices to their structures and technology. Examines semiconductor physics and technology. Includes Pn-junction, Mos, and optoelectronic devices. For both advance circuit and device engineers.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3320.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5358 (3) Optimization and Optimal Control

Introduces the theory and practice of optimization and optimal control. Topics include basic theory, nonlinear system trajectories and regulation, function space operators and derivatives, optimality conditions, barrier functionals and Newton's method in function space.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 5448.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5375 (3) Microstructures Laboratory

Offers experience in monolithic silicon integrated circuit fabrication techniques, including Ic layout, pattern compiling and generation, mask making, oxidation, photolithography, diffusion, implantation, metallization, bonding, process analysis and testing. Includes design project.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4375

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5418 (3) Automatic Control Systems 1

Coverage of principles of control systems with Multiple Inputs and Multiple Outputs (MIMO). Topics include Mimo state-space theory, applications of the singular value decomposition (SVD), coprime factorization methods, frequency domain topics, and an introduction to H-infinity design.

Requisites: Requires prerequisite course of ECEN 5448 (minimum grade C-).

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5423 (3) Chaotic Dynamics

Explores chaotic dynamics theoretically and through computer simulations. Covers the standard computational and analytical tools used in nonlinear dynamics and concludes with an overview of leading-edge chaos research. Topics include time and phase-space dynamics, surfaces of section, bifurcation diagrams, fractal dimension and Lyapunov exponents.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4423 and CSCI 4446 and CSCI 5446

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5438 (3) Robot Control

Provides a comprehensive treatment of the mathematical modeling of robot mechanisms and the analysis methods used to design control laws for these mechanisms.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites PHYS 1110 and ECEN 4138 (minimum grade C-).

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5448 (3) Advanced Linear Systems

Offers a state space approach to analysis and synthesis of linear systems, state transition matrix, controllability and observability, system transformation, minimal realization, and analysis and synthesis of multi-input and multi-output systems.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5458 (3) Sampled Data and Digital Control Systems

Provides an analysis and synthesis of discrete-time systems. Studies sampling theorem and sampling process characterization, z-transform theory and z-transferfunction, and stability theory. Involves data converters (A/D and D/A), dead-beat design, and digital controller design.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisites ECEN 3300 and ECEN 4138.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 5503 (3) Computer Systems Design and Architecture

Covers digital logic circuits, assembly language programming, and gate-level computer design and architecture. Also discusses computer arithmetic algorithms, I/O, peripheral device performance, networking, and the Internet. Limited to graduate students. For ECE/CS majors with nontraditional backgrounds.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5517 (3) Power Electronics and Photovoltaic Power Systems Laboratory

Focuses on analysis, modeling, design and testing of electrical energy processing systems in a practical laboratory setting. Studies power electronics converters for efficient utilization of available energy sources, including solar panels and utility. Experimental projects involve design, fabrication and testing of a solar power system.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4517

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5523 (3) Compiler Construction

Introduces the principles and techniques for compiling high-level programming languages to assembly code. Topics include parsing, instruction selection, register allocation, and compiling high-level features such as polymorphism, first-class functions, and objects. Students build a complete compiler for a simple language.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4553 and CSCI 4555 and CSCI 5525

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5532 (3) Digital Signal Processing Laboratory

Develops experience in code development, debugging and testing of real-time digital signal processing algorithms using dedicated hardware. Applications include filtering, signal synthesis, audio special effects and frequency domain techniques based on the Fast Fourier Transform.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4532

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5533 (3) Fundamental Concepts of Programming Languages

Considers concepts common to a variety of programming languages—how they are described (both formally and informally) and how they are implemented. Provides a firm basis for comprehending new languages and gives insight into the relationship between languages and machines.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5535

Requisites: Requires prerequisite course CSCI 3155 (minimum grade D-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5543 (3) Software Engineering of Standalone Programs

Applies engineering principles to phases of software product development, project planning, requirements definition, design, design patterns, validation and maintenance. Emphasizes practical methods for communicating and verifying definitions and designs: prototyping, inspections, and modeling (primarily UML). Includes relation to embedded systems and object-oriented design.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5548

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 1300 and CSCI 2270 (minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5553 (3) Parallel Processing

Examines a range of topics involved in using parallel operations to improve computational performance. Discusses parallel architectures, parallel algorithms and parallel programming languages. Architectures covered include vector computers, multiprocessors, network computers and data flow machines. Department enforced prerequisite: background in computer organization, introduction to programming languages and elementary numerical analysis.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5551

Recommended: Prerequisites ECEN 4593 and CSCI 3653.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5555 (3) Principles of Energy Systems and Devices

Develops principles underlying electronic, optical and thermal devices, materials and nanostructures for renewable energy. Provides a foundation in statistical thermodynamics and uses it to analyze the operation and efficiency limits of devices for photovoltaics, energy storage (batteries & ultra-capacitors), chemical conversion (fuel cells and engines), solid state lighting, heat pumps, cooling and potentially harvesting zero-point energy from the vacuum.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4555

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors) or Graduate students only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5573 (3) Advanced Operating Systems

Intended to create a foundation for operating systems research or advanced professional practice. Examines the design and implementation of a number of research and commercial operating systems and their components, system organization and structure, threads, communication and synchronization, virtual memory, distribution, file systems, security and authentication, availability and Internet services.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5573

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5583 (3) Artificial Intelligence

Surveys artificial intelligence methods, theories and applications. Studies the relationship between artificial intelligence and psychology, linguistics and philosophy. Introduces artificial intelligence programming.

Requisites: Requires prerequisite course CSCI 3245 (minimum grade C-).

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5593 (3) Advanced Computer Architecture

Provides a broad-scope treatment of important concepts in the design and implementation of high-performance computer systems. Discusses important issues in the pipelining of a processor, out-of-order instruction issue and superscalar designs, design of cache memory systems for such systems, and architectural features required for multicore processor designs. Also studies current and historically important computer architectures.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5593

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 4593.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5603 (3) Software Project Management

Presents topics and techniques critical to the management of software product development, including estimating, planning, quality, tracking, reporting, team organization, people management and legal issues. Gives special attention to problems unique to software projects.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5608 and EMEN 5031

Requisites: Requires prerequisite courses ECEN 4583 and ECEN 5543 and CSCI 4318 (all minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5606 (3) Optics Laboratory

Provides advanced training in experimental optics. Consists of optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers, and holograms and experimentation of fiber optics and Fourier optics. Department enforced prerequisite: undergraduate optics course (e.g. PHYS 4510).

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5606

Additional Information: Departmental Category: Optics

ECEN 5612 (3) Random Processes for Engineers

Deals with random time-varying functions and is therefore useful in the broad range of applications where they occur. Topics include review of probability, convergence of random sequences, random vectors, minimum mean-square error estimation, basic concepts of random processes, Markov processes, Poisson processes, Gaussian processes, linear systems with random inputs, and Wiener filtering. Applications range from communications, communication networks, and signal processing to random vibration/stress analysis, mathematical finance, physics, etc.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5613 (3) Embedded System Design

Introduces system hardware and firmware design for embedded applications. Students independently design and develop a hardware platform encompassing a microcontroller and peripherals. Firmware is developed in C and assembly. A significant final project is designed, developed, documented and presented. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5616 (3) Optoelectric System Design

Examines optical components and electro-optic devices with the goal of integrating into well design optoelectronic systems. Sample systems include optical storage, zoom lenses and telescopes.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4616

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Optics

ECEN 5622 (3) Information Theory and Coding

Covers fundamental limits of data compression, reliable transmission of information and information storage. Topics include information measures, typicality, entropy rates of information sources, limits and algorithms for lossless data compression, mutual information, and limits of information transmission over noisy wired and wireless links. Optional topics include lossy data compression, limits of information transmission in multiple-access and broadcast networks, and limits and algorithms for information storage.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5623 (3) Real-Time Embedded Systems

Design and build a microprocessor-based embedded system application requiring integration of sensor/actuator devices, a real-time operating system and application firmware and software. Real-time rate monotonic theory and embedded architecture are covered. Prioritized for EEEN graduate students with ESE (Embedded Systems Engineering) sub-plan.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5626 (3) Active Optical Devices

Analysis of active optical devices such as semiconductor laser, detector and flat panel display by clearly defining and interconnecting the fundamental physical mechanism, device design and operating principles and device performance.

Recommended: Prerequisite ECEN 5355.

Additional Information: Departmental Category: Optics

ECEN 5632 (3) Theory and Application of Digital Filtering

Digital signal processing and its applications are of interest to a wide variety of scientists and engineers. The course covers such topics as characterization of linear discrete-time circuits by unit pulse response, transfer functions, and difference equations, use of z-transforms and Fourier analysis, discrete Fourier transform and fast algorithms (FFT), design of finite and infinite impulse response filters, frequency transformations, study of optimized filters for deterministic signals.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5633 (3) Hybrid Embedded Systems

Introduces system hardware and design techniques for embedded and hybrid reconfigurable systems. Intended for those interested in developing projects using hardware description languages to build application-specific computing systems. Industry standards are used for design, development and debugging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4633

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5634 (3) Graduate Microwave and RF Laboratory

Introduce RF and microwave measurement methods. A laboratory course whose experiments build on material learned in ECEN 3410: electromagnetic waves, transmission lines, waveguides, time-domain reflection, frequency-domain measurement, microwave networks, impedance matching, antenna pattern measurement, radar and simple nonlinear concepts such as harmonics, square-law detection, mixing and transmitter/receiver applications.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4634

Requisites: Requires a prereq course of ECEN 3410 (min grade D-). Restricted to any graduate students or Electrical/Computer Engineering or Electrical Engineering Concurrent Degree majors only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 5643 (3) SW Engineering of Concurrent Systems

Addresses engineering of applications requiring multiple software processes running concurrently, sharing data, and communicating as a system in a single environment. Topics include performance analysis of architecture design; analysis of requirements, design and testing of synchronization and communication; the interplay of system design and performance with the impact of memory management, input/output, and file system support.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4643

Requisites: Requires prerequisite course of ECEN 5543 (minimum grade C-). Restricted to College of Engineering majors only.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5645 (3) Introduction to Optical Electronics

Introduces lasers, Gaussian optics, modulators, nonlinear optics, optical detectors, and other related devices.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Nanostructures and Devices

ECEN 5652 (3) Detection and Extraction of Signals from Noise

Introduces detection, estimation, and related algorithms. Topics in detection include simple/composite hypothesis testing, repeated observations and asymptotic performance and sequential detection. Topics in estimation include Bayesian estimation including minimum mean-square estimation and non-random parameter estimation. Topics in algorithms vary. Examples include algorithms for state estimation and smoothing in Hidden Gauss-Markov models and the expectation-maximization algorithm. Applications include communications, radar/sonar/geophysical signal processing, image analysis, authentication, etc.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5653 (3) Real-Time Digital Media

Learn how to design and build Linux-based real-time system applications for digital media encode/decode and transport. Course focus is on the process as well as fundamentals of designing, coding, and testing Linux-based real-time systems often used in industry for digital media systems. Students use POSIX kernel-mapped threads and drivers to implement real-time digital media solutions.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4653

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5672 (3) Digital Image Processing

Course objective is to present the fundamental techniques available for image representation and compression (e.g., wavelets), filtering (e.g., Wiener and nonlinear filter), and segmentation (e.g., anisotropic diffusion).

Requisites: Requires prerequisite course ECEN 5632 (minimum grade C-).

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5673 (3) Distributed Systems

Examines systems that span multiple autonomous computers. Topics include system structuring techniques, scalability, heterogeneity, fault tolerance, load sharing, distributed file and information systems, naming, directory services, resource discovery, resource and network management, security, privacy, ethics and social issues.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5673

Recommended: Prerequisite CSCI 5573 or a course in computer networks.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5682 (3) Theory and Practice of Error Control Codes

Introduces error control coding techniques for reliable transmission of digital data over noisy channels. Topics include algebraic characterizations of cyclic codes, convolutional codes, modern graph codes, decoding algorithms for block codes, Viterbi algorithm and iterative decoding on graphs. Applications include modern digital communication and storage systems including deep space communications, satellite broadcasting, cellular networks, and optical disk storage.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5683 (3) Programmable Logic Embedded System Design

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explores complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5686 (3) Optical Communications Systems

Emphasizes the elements that optical communication systems have in common with other communication systems. Works from a general communication system model toward fiber optic applications. Emphasizes the statistical nature of electronic based communication. Topics include 1) general system models, 2) detectors and receivers, 3) optical channels with emphasis on the single mode fiber channel, 4) coherent and incoherent systems: a) sources, b) modulation and c) detection, 5) special topics ranging from optical sensing to quantum communications.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Optics

ECEN 5692 (3) Principles of Digital Communication

Introduces fundamental principles of efficient and reliable transmission of information used in wired and wireless digital communication systems including cable modems, smart phones/tablets, cellular networks, local area (wi-fi) networks, and deep-space communications. Topics include bandwidth and power constraints, digital modulation methods, optimum transmitter and receiver design principles, error rate analysis, channel coding potential in wired/wireless media, trellis coded modulation, and equalization.

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Digital Signal Processing Communications

ECEN 5696 (3) Fourier Optics

Introduces a system level approach to the analysis and design of optical systems. Topics include holography, Fourier transform properties of lenses, two-dimensional convolution and correlation functions, spatial filtering and optical computing techniques. Also covers coherent and incoherent imaging techniques, tomography, and synthetic aperture imaging.

Recommended: Prerequisites ECEN 3300 and ECEN 3410.

Additional Information: Departmental Category: Optics

ECEN 5737 (3) Adjustable-Speed AC Drives

Presents unified treatment of complete electrical drive systems: mechanical load, electrical machine, power converter, and control equipment. Emphasizes induction, synchronous, and permanent-magnet drives. Uses simulation programs (e.g., SPICE, Finite Element/Difference Program) to simulate drive system components (e.g., gating, inverter, electric machine).

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Recommended: Prerequisite ECEN 3170.

Additional Information: Departmental Category: Power

ECEN 5743 (3) SW Engineering of Distributed Systems

Addresses engineering of networked applications and self-contained embedded system products involving multiple processors. The fundamental concepts of software engineering are complicated by an application running simultaneously and asynchronously on multiple processors over a network. Topics: specification, analysis, design, and testing of distributed components including concerns of security, synchronization, transaction coordination, data replication, web services, and service oriented architectures.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4743

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Recommended: Prerequisite ECEN 4583 or ECEN 5543 or CSCI 5548.

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5753 (3) Computer Performance Modeling

Presents a broad range of system modeling techniques, emphasizing applications to computer systems. Covers stochastic processes, queuing network models, stochastic Petri nets and simulation (including parallel processing techniques). Also requires second-semester calculus.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4753 and CSCI 4753 and CSCI 5753

Additional Information: Departmental Category: Computer and Digital Systems

ECEN 5763 (3) Embedded Machine Vision and Intelligent Automation

Introduces students to machine vision and machine learning methods used in automation, autopilots and security and inspection systems. Embedded and automation topics include implementation of algorithms with FPGA or GP-GPU embedded real time co-processing for autopilots (intelligent transportation), general automation and security including methods for detection, classification, recognition of targets for inspection, surveillance, search and rescue, and machine vision navigation applications.

Requisites: Requires prereq courses of ECEN 5613 and 5623 (all minimum grade of C). Restricted to EEEN or ECEN or C-ECENEEN or C-EEEN or CRTGE students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5797 (3) Introduction to Power Electronics

An introduction to switched-mode converters. Includes steady-state converter modeling and analysis, switch realization, discontinuous conduction mode and transformer-isolated converters. Ac modeling of converters using averaged methods, small-signal transfer functions, feedback loop design and transformer design.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4797

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECENEEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Power

ECEN 5803 (3) Mastering Embedded Systems Architecture

Acquire an understanding of embedded systems architectures for the purpose of creating prototypes or products for a variety of applications. The salient issues in the decision making process will be examined, including trade-offs between hardware and software implementations, processor and operating system selection and IP creation or acquisition. Projects will involve the latest software development and tools and hardware platforms.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5807 (3) Modeling and Control of Power Electronic Systems

Studies modeling and control topics in power electronics. Averaged switch modeling of converters, computer simulation, ac modeling of the discontinuous conduction mode, the current programmed mode, nulldouble injection techniques in linear circuits, input filter design, and low-harmonic rectifiers.

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5811 (3) Neural Signals and Functional Brain Imaging

Explores bioelectric and metabolic signals generated by the nervous system from two stand points: 1) their biophysical genesis and role in neural integration and 2) neurotechnologies such as electroencephalography, magnetoencephalography, deep brain stimulation and functional magnetic resonance imaging.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4811 and ASEN 4216 and ASEN 5216

Additional Information: Departmental Category: Bioengineering

ECEN 5813 (3) Principles of Embedded Software

Introduces principles around embedded software elements and software development needed for the Embedded Systems Engineering core curriculum. Student will write C program applications that employ efficient, high performance and robust software design techniques. Topics include bare-metal firmware, C-programming optimization and introductions to underlying embedded architecture. Sound testing and debug practices will be instilled and utilized in several application projects.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5817 (3) Resonant and Soft-Switching Techniques in Power Electronics

Covers resonant converters and inverters, and soft switching; sinusoidal approximations in analysis of series, parallel, LCC, and other resonant dc-dc and dc-ac converters; state-plane analysis of resonant circuits; switching transitions in hard-switched and soft-switched PWM converters; zero-voltage switching techniques, including resonant, quasi resonant, zero voltage transition, and auxiliary switch circuits.

Requisites: Requires prerequisite course of ECEN 5797 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5821 (3) Neural Systems and Physiological Control

A biophysical exploration of human physiology from the standpoints of control systems and neural information processing. Topics include: neural control of movement and cardiovascular performance, tissue growth and repair, carcinogenesis, and physiological responses to microgravity.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4821 and ASEN 4426 and ASEN 5426

Additional Information: Departmental Category: Bioengineering

ECEN 5823 (3) Internet of Things Embedded Firmware

Acquire firmware development skills to meet low energy and internet connectivity demands of embedded systems. Event-driven firmware techniques will be explored through programming assignments, transitioning to programming an Internet of Things RF Network Protocol such as Bluetooth Low Energy or Thread. The coursework will align with the latest industry firmware and embedded wireless protocol trends.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5827 (3) Analog IC Design

Covers the fundamentals of transistor-level analog integrated circuit design. Starting with motivations from application circuits, the course develops principles of dc biasing, device models, amplifier stages, frequency response analysis and feedback and compensation techniques for multi-stage operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4827

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Power

ECEN 5830 (3) Special Topics

Examines a special topic in Electrical, Computer and Energy Engineering.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 5831 (3) Brains, Minds, and Computers

Provides background for the design of artificially intelligent systems based upon our present knowledge of the human brain. Includes similarities and differences between the brain and computers, robots and common computer models of brain and mind. Emphasizes the neuron as an information processor, and organization of natural as well as synthetic neural networks.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 4831 and ASEN 5436

Requisites: Restricted to Electrical/Computer Engineering (EEEN) graduate students or Concurrent Degree students in Electrical Engineering (C-EEEN) or Electrical/Computer Engineering (C-ECEN) or to Graduate Certificate Engineering (CRTGE) students.

Additional Information: Departmental Category: Bioengineering

ECEN 5837 (3) Mixed-Signal IC Design Lab

Software laboratory course extends the concepts developed in ECEN 5827 to full design and layout of mixed analog and digital custom integrated circuits. Assignments explore implementation of analog to digital and digital to analog converters, and final project develops a full custom IC for a target application.

Requisites: Requires prerequisite course of ECEN 5827 (minimum grade C-).

Additional Information: Departmental Category: Power

ECEN 5840 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the master's level. Numbered ECEN 5840-5849. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 5863 (3) Programmable Logic Embedded System Design

Learn to design programmable systems on a chip for the purpose of creating prototypes or products for a variety of applications. Explore complexities, capabilities and trends of Field Programmable Gate Arrays (FPGA) and Complex Programmable Logic Devices (CPLD). Implement synchronization and timing closure in these devices. Projects will involve the latest software and FPGA development tools and hardware platforms.

Requisites: Restricted to graduate students in Electrical Engineering (EEEN) or in Electrical/Computer Engineering (ECEN) or to Electrical or Electrical/Computer Engineering BS/MS Concurrent degree students or to Graduate Certificate Engineering (CRTGE) students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Embedded Systems Engineering

ECEN 5907 (3) Special Topics

Special topics class.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

ECEN 6016 (1-3) Special Topics

Additional Information: Departmental Category: Optics

ECEN 6139 (3) Logic Synthesis of VLSI Systems

Studies synthesis and optimization of sequential circuits, including retiming transformations and don't care sequences. Gives attention to hardware description languages and their application to finite state systems. Also includes synthesis for testability and performance, algorithms for test generation, formal verification of sequential systems, and synthesis of asynchronous circuits.

Recommended: Prerequisites ECEN 5139 and CSCI 5454.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 6144 (3) Electromagnetic Boundary Problems

Provides mathematical and physical fundamentals necessary for the systematic analysis of electromagnetic fields problems. Covers basic properties of Maxwell's equations, potentials and jump conditions; scattering and diffraction by canonical structures; Green's functions, integral equations and approximate methods. Requires some maturity in electromagnetics.

Requisites: Requires prereq course of ECEN 5114 or 5134 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

Additional Information: Departmental Category: Electromagnetics and Remote Sensing

ECEN 6800 (3) Master of Engineering Report

Additional Information: Departmental Category: General

ECEN 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

ECEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

ECEN 6960 (3) Master of Engineering

Additional Information: Departmental Category: General

ECEN 7438 (3) Theory of Nonlinear Systems

Nonlinear systems and control. Introduction to nonlinear phenomena: multiple equilibria, limit cycles, bifurcations, complex dynamical behavior. Planar dynamical systems, analysis using phase plane techniques. Input-output analysis and stability. Passivity. Lyapunov stability theory. Feedback linearization. Exploration of examples and applications.

Requisites: Requires prerequisite course of ECEN 5448 (minimum grade C-). Restricted to graduate students in Electrical Engr (EEEN) or Electrical/Computer Engr (ECEN) or Electrical Engr Concurrent or Electrical/Computer Engr Concurrent Degree students only.

Additional Information: Departmental Category: Dynamical Systems and Control

ECEN 7840 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General

ECEN 7849 (1-6) Independent Study

Offers an opportunity for students to do independent, creative work at the doctoral level. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: VLSI CAD Methods

ECEN 8990 (1-10) Doctoral Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Additional Information: Departmental Category: General

Energy Engineering (ENEN)

Courses

ENEN 2820 (1-6) Special Topics

Explores topics related to energy engineering. Content will vary by semester and instructor.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

ENEN 4321 (3) Oil and Gas Processing

Provides a foundation in the fundamentals of oil and gas processing, including discovery, extraction and refining. Due to the importance of oil and gas in the current energy infrastructure, this course provides a broad understanding of the industry to students interested in energy engineering.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

ENEN 4600 (3) Interdisciplinary Energy Engineering Projects

Prepares students to analyze energy systems from technical, economic, and policy perspectives, with project topics varying by semester.

Provides historical and contemporary context of the energy landscape. Emphasizes application of engineering fundamentals for the design and evaluation of real world energy systems. Projects will be completed in interdisciplinary teams.

Requisites: Requires prerequisite courses of ENVS 3621 and CHEN 3660 (all minimum grade C). Restricted to Energy Engineering Minor (ENMR-MIN) majors only.

Grading Basis: Letter Grade

ENEN 4840 (1-6) Special Topics

Explores topics related to energy engineering. Content will vary by semester and instructor.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Engineering for Developing Communities (EDEN)

Courses

EDEN 5001 (3) Special Topics in Development Engineering

At the graduate level, covers topics of interest in development, for both domestic and international locations. Content varies by section and from semester to semester.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Engineering Honors (EHON)

Courses

EHON 1151 (3) Critical Encounters

Explores critical, literary and philosophical approaches to the following related problems: 1) how we organize knowledge and construct meaning, and 2) how we locate a sense of self as both individuals and members of various groups amidst the resources and demands of competing interpretations, traditions challenges and circumstances. Department restriction, honors standing or instructor consent required.

Requisites: Restricted to Engineering Honors Program (PEHN) students only.

EHON 1500 (1) Honors Reading Group

Faculty led reading seminars, focusing on specific text or texts chosen by the faculty. Special attention will be paid to group formation and the process of collaborative learning.

Requisites: Restricted to Engineering Honors Program (PEHN) students only.

Additional Information: Engineering Honors Course

EHON 3843 (3) Special Topics

Explores different important themes relative to the Engineering Honors Program. Check with department for specific semester topics.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Engineering Honors Program (PEHN) students only.

Additional Information: Engineering Honors Course

EHON 4051 (1) Dimensions of Leadership

Explores the many dimensions of leadership that exceed technical knowledge: the ethical, societal, cultural, interpersonal, and personal. Through seminars, workshops and exposure to leaders, students will reflect upon their engineering education in light of the multifaceted demands of effective leadership and their own personal career goals. Students will take an active role in shaping the course. Department restriction, honors standing or instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Engineering Management (EMEN)

Courses

EMEN 3100 (3) Introduction to Engineering Management

Examines topics important to the management of engineering activities within organizations. Topics include the relationship of engineering to business and management disciplines, the functions of an engineering manager, principles and techniques for managing financial resource and business ownership. Explores best practices in global engineering management, process management, legal issues, ethics, organizational behavior and communications.

Grading Basis: Letter Grade

EMEN 4030 (3) Project Management Systems

Gain skills in project management, one of the fastest growing professions, using standard processes that fit into any industry, sector or geography. This interactive class provides students with the tools necessary to effectively initiate, execute, control and close any type of project for increased success. Students learn the skills to oversee projects to ensure it meets its goals, time line and budget.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4050 (3) Leadership and Professional Skills

Accelerate your personal and professional growth with the essential skills required to become an effective leader/manager. Conduct personal development through exercises in communication and leadership effectiveness. Explore leadership styles, managing commitments, change management, negotiation, conflict resolution, organizational culture, emotional intelligence, team dynamics and business ethics.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4100 (3) Engineering Economics

Introduces engineering cost concepts, financial statements and the corporate economic environment. Includes concepts and methods of analysis of the time value of money, comparison of project alternatives before and after taxes, cash flow, replacement analysis, risk management and financial case statements.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4200 (3) Engineering and Entrepreneurship for the Developing World

Use your engineering and problem solving skills, combined with market/industry research, customer interviews, design for manufacturability, stakeholder management and financial modeling to promote entrepreneurship and sustainable change in the developing world. Explore alternative energy, medical devices, phones, internet, recycling, cook stoves, clean water, sanitation and infrastructure.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

EMEN 4400 (3) Process and Quality Systems

Introduces the concepts, tools and techniques used in the management and measurement of quality and productivity in a business environment. Associated topics include: statistics methods, design quality, measurement, control and process improvement. Discover the basics of performance excellence management including Baldrige Award criteria, strategic planning, leadership and daily quality management.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4405 (3) Systems Engineering

Introduces students to system engineering in terms of defining objectives, applications and the major steps in the systems engineering process. Learn to work effectively with diverse project teams. Industry standards are covered that lay out the steps of the classic Systems Engineering lifecycle. Real world engineering examples from concept exploration to hardware retirement are used.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

EMEN 4800 (3) Technology Ventures and Marketing

Learn marketing concepts, skills and tools to launch new products and ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills and tools to be successful colleagues, managers and leaders in industry. Gain valuable business acumen using a hands-on learning environment.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4825 (3) Entrepreneurial Business Plan Preparation

Instructs students in the necessary elements of a business plan and how to prepare a complete well-written plan for an entrepreneurial business venture. Students work in interdisciplinary business-engineering five-person teams to create a business concept and take it through to business plan completion.

Equivalent - Duplicate Degree Credit Not Granted: ESBM 4830

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

EMEN 4830 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMEN 4840 (1-3) Independent Study Project

Available only through approval of Engineering Management Program. Subjects arranged to fit the needs of the particular student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

EMEN 5000 (3) Engineering Analysis

Provides an introduction to the logical and systematic thinking required to solve typical engineering problems in mechanics, electricity, thermodynamics, fluid mechanics, electricity, thermodynamics, fluid mechanics and renewable energy. Emphasizes understanding the physical behavior of systems and applying the principles and laws from the physical sciences to analyze these systems. Required for non-engineers seeking admission to the Engineering Management graduate degree program.

EMEN 5005 (3) Introduction to Applied Statistical Methods

Covers statistical reasoning and statistical analysis for applications related to business and engineering decision making. Topics include an introduction to engineering and applied research, descriptive statistical analysis and its foundations, inferential statistics to include estimation and hypothesis testing using both traditional parametric as well as nonparametric procedures for research situations involving one or two groups of treatment conditions.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) or graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5010 (3) Introduction to Engineering Management

Learn concept, methods, activities and philosophies of business and be encouraged to utilize them in your professional activities. Interact with engineering management faculty who share what works based upon their engineering management experiences. Engage with our classmates on their business experience, thereby preparing you to interact more thoughtfully and knowledgeably with your professional colleagues.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5020 (3) Finance and Accounting for Engineering Managers

Learn concepts and skills necessary to assess financial performance, including the analysis of income statements, balance sheets and cash flow statements. Apply the concepts and skills of corporate finance to your personal finance, including the creating of a diversified investment portfolio. Enhance your management credentials by being knowledgeable in corporate finance.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5030 (3) Fundamentals of Project Management

Provides an in-depth introduction to the project management discipline, including the concepts, tools and techniques used in the management and leadership of projects small and large alike. Key topics covered include the role of the project manager; project team selection and management; cost, schedule and risk management; quality in projects; introduction to creating and maintaining project plans through the project lifecycle.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5031 (3) Software Project Management

Introduces software project management as a critical element of software development activities throughout every area of human endeavor. Learn the software life cycle, software configuration management, code reviews, architectural influences and quality assurance with automated testing. Explore the impact on project success of the Capability Maturity Model (CMM) and United Modeling Language (UML).

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5608 and ECEN 5603

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

Recommended: Prerequisite software development experience.

EMEN 5032 (3) Advanced Topics in Project Management

Covers advanced topics in project management from a systems view based on the Project Management Body of Knowledge (PMBOK); spans the entire project life cycle. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5030 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5040 (3) Quality, Strategy, and Value Creation

Introduces the fundamentals of Business Performance Excellence (BPE including theories of leadership, theories of business, core competencies, Deming's theory of Profound Knowledge, strategic differentiation and all of the elements of strategy development.) Addresses strategic planning and policy deployment to map the company's strategy to all parts of the organization, a process strengthened through employee empowerment.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5041 (3) Advanced Topics in Value Creation

Focuses on the advanced study of methods designed to maximize excellence in business performance. Includes a model to understand process and product tradeoffs, interactions with supplies, integrated manufacturing systems and meeting customer requirements while maximizing profitability. These characteristics are addressed both strategically and tactically through the use of case analysis, field study and experiential learning for production and service sectors.

Requisites: Requires prerequisite courses of EMEN 5005 and EMEN 5040 (all minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5042 (3) Methods for Quality Improvement

Develop in-depth expertise in the concepts, tools and techniques used in the management and measurement of quality and productivity. Apply statistics and probability to the topics of process variation and statistical process control and capability analysis for process, product, and measurement systems. Explore an introduction to design of experiments (DOE) in business and industry to improve both quality and performance.

Requisites: Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5043 (3) Advanced Topics in Quality Systems/ Engineering

Advanced study of methods, tools, techniques and systems associated with advanced quality applications. Includes a survey of advanced process control technologies, control schemes and measurement system analysis. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5042 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5050 (3) Leading Oneself

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5050

Requisites: Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5080 (3) Ethical Decision-Making in Engineering Management

Learn how to recognize ethical issues and dilemmas affecting managers in the workplace. Understand various models and practices offering solutions to these issues and how to create a culture of ethics and integrity in supporting and/or building a profitable, healthy and responsible organization.

Requisites: Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5090 (3) Marketing and Technology Ventures

Learn the basics of marketing for developing a technology innovation as a commercially successful product, including customer development as a part of product development. Designed to be of interest to engineers in existing companies and startups. The format includes in-depth discussions of real-world case studies and marketing strategies for the high tech environment. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5020 (minimum grade B). Restricted to College of Engineering graduate students or to Graduate Certificate Engineering (CRTGE) students only.

EMEN 5094 (3) Entrepreneurship for Engineers

Explores the concepts of entrepreneurship as it relates to forming an innovative and successful technology based venture. Takes a very practical approach to entrepreneurship with a semester long project that incorporates all the fundamental elements of new business creation. The objective is to enable engineering students to transform their own creative technical idea into a viable and sustainable business opportunity.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

Grading Basis: Letter Grade

EMEN 5400 (3) Product Development and Design

Provides state-of-the-art techniques for improving the identification and creation of new products, services and brands that provide an exceptional customer experience. Both proven and emerging management techniques in new product management are covered.

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

Recommended: Prerequisites EMEN 5020 and EMEN 5090.

EMEN 5405 (3) Fundamentals of Systems Engineering

Examines the disciplined processes of designing and managing complex systems over their life cycle. Requirements engineering, reliability, logistics, team leadership, testing and evaluation, maintainability and other disciplines are examined with focus on the system engineering of small spacecraft.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5188

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5500 (3) Lean and Agile Management

Learn lean and agile concepts and tools to improve customer value, improve processes and reduce waste. Examine and apply lean and agile principles in diverse circumstances including hardware/software, product development/ongoing operations and manufacturing products/providing services. Apply your learning to improving performance in current responsibilities, whether as an individual contributor or as a manager.

Equivalent - Duplicate Degree Credit Not Granted: OPIM 6080

Requisites: Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5610 (3) Advanced Statistical Methods for Engineering Research

Combines intermediate and advanced statistical methods (Two- and Three-Way ANOVA and post hoc analyses for a large variety of specific designs). Real data sets are employed permitting a focus on engineering research in support of business decision making through the integration of cost benefit analysis and process performance. Parametric as well as nonparametric methods of analysis are included.

Requisites: Requires prerequisite course of EMEN 5900 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5620 (3) Data Mining and Screening Experiments for Engineering Research

Combines intermediate and advanced statistical methods with practical research applications. Develops commonly used statistical models such as Two and Three-Way Analysis of Variance and the analysis of Fractional Factorial Designs for the solution of common business and industrial research problems. The statistical models are implemented and interpreted in the context of actual data sets using available statistical software.

Requisites: Requires prerequisite course of EMEN 5610 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5710 (3) Applied Business Decisions

Team up with fellow classmates to launch a high-tech company as part of an eight quarter project in a competitive, simulated business environment. Make decisions in product development, marketing, operations and finance based on results of the previous quarter. Prepare a business pitch and executive summary to justify additional venture capital or a bank loan. Non-EMP students require instructor consent.

Requisites: Requires prerequisite course of EMEN 5020 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 5825 (3) Intrapreneurship & Innovation

Learn a comprehensive set of business concepts, skills and tools to launch and manage intrapreneurial ventures. Engage with faculty, classmates, guest speakers, industry professionals, potential customers and one's leadership team to help you launch your venture. Develop the necessary skills, tools and awareness to be successful colleagues, managers and leaders in scientific and engineering industries. Gain valuable business acumen using a hands-on and learning environment.

EMEN 5830 (3) Special Topics

Non-EMP students require instructor consent.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering graduate students only.

EMEN 5840 (1-3) Independent Study Project

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. Non-EMP students require instructor permission.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in Engineering Management Program (EMEN) only.

EMEN 5900 (3) Research Methods and Experimental Design

Explores commonly used research methods including analytical, agreement, descriptive and relational methods; experimental design including incorporation, nesting, blocking and controlling; threats to the internal and external validity of research. Also reviewed are sampling procedures and considerations, measurement validity and reliability, and managing the research study.

Requisites: Requires prerequisite course of EMEN 5005 (minimum grade B). Restricted to College of Engineering graduate students or Graduate Certificate Engineering (CRTGE) students only.

EMEN 6805 (1) Capstone Preparation

Students determine capstone research question, conduct literature review, develop research methodology and project plan, write a proposal, and select capstone committee.

Requisites: Requires prerequisite course of EMEN 5825 or EMEN 5900 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

EMEN 6810 (2) Capstone Completion

Continues EMEN 6805 as the second half of a two-course sequence for the engineering management capstone project. Students conduct agreed-upon research, research and analyze results, develop recommendations, write a final report, and present the project to the committee for evaluation.

Requisites: Requires prerequisite course of EMEN 6805 (minimum grade C+). Restricted to graduate students in Engineering Management Program (EMEN) only.

EMEN 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students in Engineering Management Program (EMEN) only.

Grading Basis: Pass/Fail

English (ENGL)

Courses

ENGL 1001 (3) Freshman Writing Seminar

Provides training and practice in writing and critical thinking. Focuses on the writing process, the fundamentals of composition, and the structure of argument. Provides numerous and varied assignments with opportunity for revision.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Arts and Sciences majors only.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Undergraduate Writing
MAPS Course: English

ENGL 1191 (3) Introduction to Creative Writing

Introduces techniques of fiction and poetry. Student work is scrutinized by the instructor and may be discussed in a workshop atmosphere with other students. May not be taken concurrently with ENGL 2021 or ENGL 2051. May not be repeated. Not open to graduate students.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 1210 (3) The Novel

Explores the many possibilities of the novel, or, the novel as possibility, and emphasize that formal and aesthetic innovation is not peripheral to the novel's development but central to its influence and existence. Focuses on the elements of fiction in order to develop an aesthetic and literary appreciation of this complex art form.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Literature and Language

ENGL 1220 (3) From Gothic to Horror

Explores literature in the Gothic mode and aesthetic and critical theories related to modern "horror" genres or their precursors. Introduces literary-critical concepts (such as notions of abjection, repression and anxiety) that developed alongside this branch of literature. Students read canonical works in British and American traditions while reflecting on notions of popular or marginalized literature.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1230 (3) Environmental Literature

Introduces students to the tradition of nature writing dating from Romanticism through realist and experimental contemporary literary texts. Students will study key terms and concepts related to the environment such as anthropocentrism, bioregionalism, eco-cosmopolitanism, environmental justice, deep ecology, and posthumanism. They will apply them to different literary genres toward developing critical analyses and environmental readings.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 1260 (3) Introduction to Women's Literature

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

Equivalent - Duplicate Degree Credit Not Granted: WGST 1260

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General Literature and Language

ENGL 1340 (3) Mysticism and the Jewish American Literary Tradition

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1234

Grading Basis: Letter Grade

Additional Information: Departmental Category: American Literature

ENGL 1420 (3) Poetry

Introduces students to how to read a poem by examining the great variety of poems written and composed in English from the very beginning of the English language until recently.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: General Literature and Language

ENGL 1500 (3) Masterpieces of British Literature

Introduces students to a range of major works of British literature, including at least one play by Shakespeare, a pre-20th century English novel, and works by Chaucer and/or Milton.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: General Literature and Language

ENGL 1600 (3) Masterpieces of American Literature

Enhances student understanding of the American literary and artistic heritage through an intensive study of a few centrally significant texts, emphasizing works written before the 20th century.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: General Literature and Language

ENGL 1800 (3) American Ethnic Literatures

Introduces significant fiction by ethnic Americans. Explores both the literary and the cultural elements that distinguish work by these writers. Emphasizes materials from Native American, African American, and Chicano traditions.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: General Literature and Language

ENGL 2021 (3) Introductory Poetry Workshop

Introductory course in poetry writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 1191 (minimum grade B). Not open to graduate students.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 2036 (3) Introduction to Media Studies in the Humanities

Serves as an introduction to media studies specifically from a humanities perspective. Studies both histories and theories of media from the 20th and 21st centuries. Touches on methodologies for undertaking media studies (including distant reading and media archaeology). Objects of study may include such topics as film, radio, social media platforms and games, as well as digital art and literature.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 2036

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 2051 (3) Introductory Fiction Workshop

Introductory course in fiction writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 1191 (minimum grade B).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 2058 (3) Twentieth- and Twentyfirst-Century Literature

Surveys the major literary trends in prose and poetry from 1900 to the present in the Anglo-American tradition of modern, postmodern, and contemporary literature. Provides students with a grounding in the major authors and motifs of 20th- and 21st-century in literature in conjunction with political and cultural changes across the periods.

Additional Information: Departmental Category: Critical Studies in English

ENGL 2102 (3) Literary Analysis

Provides a basic skills course designed to equip students to handle the English major. Emphasizes critical writing and the acquisition of basic techniques and vocabulary of literary criticism through close attention to poetry and prose.

Requisites: Restricted to English (ENGL) majors and minors only.

Additional Information: Departmental Category: General Literature and Language

ENGL 2112 (3) Introduction to Literary Theory

Introduces students to a wide range of critical theories that English majors need to know. Covers major movements in modern literary/critical theory, from Matthew Arnold through new criticism to contemporary postmodern frameworks. Required for all English majors.

Requisites: Restricted to English (ENGL) majors and minors only.

Additional Information: Departmental Category: General Literature and Language

ENGL 2115 (3) American Frontiers

Considers the backdrop of the American West in literature, film, photography and computer gaming. Focuses on a range of narratives and images depicting this wide swathe of American geography while simultaneously cultivating close reading skills, digital media analysis and film analysis that will aid in deeper insights at the textual level.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: American Literature

ENGL 2503 (3) British Literary History to 1660

Provides a chronological study of great figures and forces in English literature from Beowulf to 1660.

Additional Information: Departmental Category: British Literature to 1660

ENGL 2504 (3) British Literary History after 1660

Provides a chronological study of great figures and forces in English literature from 1660 to the present. Formerly ENGL 2512.

Additional Information: Departmental Category: British Literature after 1660

ENGL 2655 (3) Introduction to American Literature I

Chronological survey of the literature from Bradford to Whitman.

Additional Information: Departmental Category: American Literature

ENGL 2665 (3) Introduction to American Literature 2

Chronological survey of the literature from Whitman to Faulkner. Continuation of ENGL 2655.

Additional Information: Departmental Category: American Literature

ENGL 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 2707

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2717 (3) American Indian Literature

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2713

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2727 (3) Survey of African American Literature 1

Surveys African American literature from the 17th century through the Harlem Renaissance and Depression.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2737 (3) Survey of African American Literature 2

Surveys African American literature from the Depression to the present.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2732

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2747 (3) Chicana/Chicano and Mexican Literature

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2746

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 2767 (3) Survey of Post-Colonial Literature

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2761

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3000 (3) Shakespeare for Nonmajors

Introduction to Shakespeare. Introduces students to 6-10 of Shakespeare's major plays. Comedies, histories, and tragedies will be studied. Some non-dramatic poetry may be included. Viewing of Shakespeare in performance is often required.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only. English (ENGL) and Humanities (HUMN) majors are excluded from taking this class.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 3005 (3) The Literature of New World Encounters

Explores American literature as a site of cultural intersection between European settlers and indigenous peoples.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3008 (3) Developments in the Novel, Post-1900

Introduces students to the major works, authors and formal trends of the 20th and 21st-century novel. Texts may be drawn from British, American and global literary traditions. Focuses on a specific movement, development, or transformation in the genre post-1900, for instance, modernism, postmodernism, naturalism, realism, postcolonial fiction, historical fiction.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Critical Studies in English

ENGL 3011 (3) Literary Forms and Styles in Post-1900 Literature

Studies special topics in literary forms and styles (e.g. magical realism, naturalism, language poetry, etc.) and also the development of genres (e.g. poetry, drama, digital media, novel) in the 20th- and 21st-centuries. Topics vary each semester. Specially design for English majors. May be repeated for a total of 6 units for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3021 (3) Intermediate Poetry Workshop

Intermediate course in poetry writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 2021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3025 (3) American Nationalisms

Examines how literature participates in the creation of American national culture and identity. Surveys major political writing and a variety of literary genres, tropes, and themes from early native American tales to the 20th-century literature.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3041 (3) Studies in Fiction and Poetry

Examines literary forms and themes with special emphasis on issues related to the craft of poetry and fiction. This course is taught in conjunction with visiting lectures by practicing writers. Does not count as Creative Writing workshop credit.

Requisites: Requires prerequisite course of ENGL 1191 (minimum grade B).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3051 (3) Intermediate Fiction Workshop

Intermediate course in fiction writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course ENGL 2051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3060 (3) Modern and Contemporary Literature for Nonmajors

Close study of significant 20th-century poetry, drama, and prose works. Readings range from 1920s to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 3068 (3) Literature in English, 1900-1945

Surveys major literary trends from 1900-1945 in the Anglo-American tradition, including the characteristics of literary modernism. Covers both prose and poetry, as well as the relationship between literature and history to the close of World War II.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Critical Studies in English

ENGL 3078 (3) Literature in English, 1945-Present

Explores major literary and theoretical trends in the Anglo-American tradition after 1945.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Recommended: Prerequisites ENGL 2102 and ENGL 2058.

Additional Information: Departmental Category: Critical Studies in English

ENGL 3081 (3) Intermediate Nonfiction Workshop

Discussion and practical criticism of student work and discussion of relevant works of literary nonfiction.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 2021 or ENGL 2051 (minimum grade B). Restricted to English (ENGL), Humanities (HUMN), Theatre (THTR or TBFA) majors only or Creative Writing (CRW) minor students only.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 3088 (3) Major Authors of Post-1900 Literature

Provides an in-depth study of the work of one or two major authors in the Anglo-American tradition after 1900. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Critical Studies in English

ENGL 3116 (3) Topics in Advanced Theory

Studies special topics in theory; specially designed for English majors. Topics vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 2112 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3164 (3) History and Literature of Georgian Britain

Provides an interdisciplinary study of England in one of its most vibrant cultural and historical periods. Topics include politics, religion, family life, and the ways contemporary authors understood their world.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: British Literature after 1660

ENGL 3204 (3) Developments in the Novel

Covers the development of the novel.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3217 (3) Topics in Gender Studies

Studies special topics in gender studies; specially designed for English majors. Topics vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3226 (3) Folklore

Emphasizes formal study of folk traditions (including tales, songs, games, customs, beliefs, and crafts) within a theoretical framework, using examples from several cultures.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3235 (3) American Novel

Surveys the American novel. Covers the early development of the American novel, its rise in the 19th- and 20th-centuries, and its contemporary expressions. Students will be introduced to theories of the novel, the major movements and authors, as well as the characteristics that define the American novel as unique.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3245 (3) American Poetry

Surveys American poetry from the 17th- to the 21st-century. Includes training in poetic theory, form, and genre, as well as in poetic analysis.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3246 (1-3) Topics in Popular Culture

Studies special topics in popular culture; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3267 (3) Women Writers

Introduces literature by British and American women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3267

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3300 (3) Literary London

Study the works of a major author, school or period of English literary history in London. Subject rotates each year, with possible topics ranging from medieval to contemporary literature. Course incorporates local sites, landmarks, museums, performances and scholars. Application through the Office of International Education required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: General Literature and Language

ENGL 3310 (3) The Bible as Literature

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly ENGL 3312.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3310 and JWST 3310

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Backgrounds to Literature in English

ENGL 3377 (3) Multicultural Literature

Studies special topics in multicultural literature; specially designed for English majors. Topics vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3523 (3) The Renaissance in England, 1500-1600

Selected prose and non-dramatic poetry from Skelton and More through Shakespeare and his contemporaries. Formerly ENGL 4523.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3533 (3) The Renaissance in England, 1600-1700

Selected prose and poetry by Donne, Jonson, Bacon and their successors. Formerly ENGL 4533.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3544 (3) The Restoration and the Eighteenth Century

Surveys main currents in the literature and culture of the long 18th century. Formerly ENGL 4544.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3553 (3) Geoffrey Chaucer

Selection of Chaucer's works, including *The Canterbury Tales* and other shorter poems. Includes an introduction to Middle English.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3563 (3) Shakespeare

Shakespeare's poetry and drama.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3564 (3) Romanticism

Surveys British Romanticism, including Blake, Coleridge, Wordsworth, Keats, Shelley, and Byron.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3573 (3) Shakespeare in Performance

Focuses on Shakespeare the dramatist through the study of the three Shakespeare plays produced in the summer by the Colorado Shakespeare Festival. In addition to exploring the text, the historical context and performance conventions c. 1600, students meet the CSF teams (professional directors, dramaturgs, designers and actors) of the three plays and the Producing Artistic Director of the CSF.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3583 (3) Milton

Milton's poetry and selected prose.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3593 (3) Major Authors in British Literature before 1660

Focuses on one major author of the medieval or early modern period, such as William Langland, John Lydgate, Edmund Spenser or Ben Jonson. Course content varies with instructor and may include literary influences, contemporary writers, and historical influences as necessary to understanding the writer. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature to 1660

ENGL 3604 (3) The Victorian Era

Surveys main currents of Victorian thought in prose and poetry.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: British Literature after 1660

ENGL 3675 (3) Major Authors in American Literature

Provides an in-depth study of the work of one or two major American authors. Explores the range, influences, and development of a writer over his or her life.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 3767 (3) Feminist Fictions

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality—and thereby the creative malleability—of gender itself. Some cinematic and performance texts will also be included.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3767

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 3796 (3) Queer Theory

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 3796

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3856 (1-3) Topics in Genre Studies

Studies special topics in genre studies; specially designed for English majors. Topics vary each semester. May be repeated for a total of 6 credit hours for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 3930 (1-6) Internship

Provides academically supervised opportunity for upper-division students to work in public or private organizations on projects related to students' career goals and to relate classroom theory to practice. Department enforced prerequisite: 3.0 GPA and faculty supervision.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 3940 (1-3) Service Learning Practicum

Under faculty supervision, students participate in a service project in conjunction with an academic course.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: General Literature and Language

ENGL 4003 (3) Introduction to Old English

Introduces students to Old English, the ancient ancestor of Modern English (as Latin is the ancestor of Spanish and Italian, distinct from both). Course will focus on reading knowledge through grammar study and translation, and to a lesser extent on pronunciation. Provides basic parsing and translation skills and an introduction to the history, culture, and literature of Anglo-Saxon England.

Additional Information: Departmental Category: British Literature to 1660

ENGL 4013 (3) Intermediate Old English

Continues development of skills in Old English reading and translation. Translation and literary study of one longer work and a number of shorter related works. Repeatable course rotates on a three-year basis, for instance, year one may focus on Beowulf and shorter heroic elegies; year two may involve prose such as legends and saints' lives; year three may involve religious poetry.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 4003 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: British Literature to 1660

ENGL 4018 (3) Global, Transnational and Postcolonial Approaches to Post-1600 Literature

Studies special topics that focus on transnational and global issues in the 20th- and 21st-century literature. For instance, the emergence of globalization, the impact of cross-cultural exchanges, the increase of migration, or the legacies of imperialism. Topics vary each semester. Specially designed for English majors. May be repeated for a total of 6 units for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4021 (3) Advanced Poetry Workshop

Advanced course in poetry writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course ENGL 3021 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4026 (3) Special Topics in Genre, Media, and Advanced Writing

Studies theoretical and historical approaches to genre, media, and writing at the advanced level.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 4039 (3) Critical Thinking in English Studies

Concerned with developments in the study of literature that have significantly influenced our conception of the theoretical bases for study and expanded our understanding of appropriate subject matter.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite courses of ENGL 2102 and ENGL 2112 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) English (ENGL) or Humanities (HUMN) majors only.

Additional Information: Departmental Category: Critical Studies in English

ENGL 4048 (3) Modern British and Irish Novel

Studies major figures and trends in the 20th century. Formerly ENGL 4224.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4051 (3) Advanced Fiction Workshop

Advanced course in fiction writing.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4071 (3) Screenwriting Workshop

Designed to give students practical criticism of their script writing and technical format requirements. Either stage plays or screenplays are studied, as announced.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4081 (3) Playwriting Workshop

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of ENGL 3021 or ENGL 3051 (minimum grade B). Restricted to Creative Writing minor students or students with a sub plan of Creative Writing.

Additional Information: Departmental Category: Undergraduate Writing

ENGL 4098 (3) Special Topics in the Novel, Post-1900

Explores a special topic in literature written in, or translated into English, post-1900.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Critical Studies in English

ENGL 4113 (3) History and Culture of Medieval England

Explores the major historical, literary, and cultural developments in England from the Anglo-Saxon period through the 15th-century.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: British Literature to 1660

ENGL 4116 (3) Advanced Topics in Media Studies

Studies specialized topics in the history, theory, and practice of media, such as the history of the book, the theory of digital media, and the theory and practice of multimedia forms. Specially designed for English majors. Topics vary year to year.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 4250 (3) Modern and Contemporary Novel

Close study of masterpieces by such novelists as Proust, Joyce, Woolf, Lawrence, Mann, Kafka, and Faulkner.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 4277 (3) Topics in Women's Literature

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4277

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4286 (3) Folklore 2

Upper-division studies of folk groups, events, texts, and contexts as they reflect traditional knowing-folk perceptions and teachings about the structure and purpose of the universe.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Advanced Theory, Genre Studies and Popular Culture

ENGL 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 4287 and WGST 4287

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4360 (3) Modern Drama

Explores continental, British, and American drama since Ibsen.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 4460 (3) Modern Poetry

Selects works of British and American poets from 1900 to the present.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Literature and Language

ENGL 4503 (3) Continental Medieval Literature

Intensive study of the major literary works of the Middle Ages in Europe.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4513 (3) British Medieval Literature

Intensive study of the major literary works of the Middle Ages in Britain.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4514 (3) Advanced Topics: The Restoration and the Eighteenth Century

Covers advanced topics in the Restoration and Eighteenth-century.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4524 (3) Advanced Topics: Romanticism

Covers advanced topics in British Romanticism. Formerly ENGL 4574.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4583 (3) Elizabeth I and Her Times

Interdisciplinary course explores different aspects of the reign of Elizabeth I: social and political history; literature; theater; music. Explores the role and impact of a female ruler on English culture.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4624 (3) Transnational/Historic/Interdiscipline Approaches 1660-1900

Explores a special topic in British literature written between 1660-1900 that crosses traditional divisions of nationality, history, and discipline.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4634 (3) Advanced Topics: The Victorian Era

Covers advanced topics in Victorian literature. Formerly ENGL 4614.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature after 1660

ENGL 4655 (3) Studies in American Literature to 1900

Extensive study of particular periods and movements in American literature.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 4665 (3) Studies in American Literature after 1900

Extensive study of particular periods and movements in American literature.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 4677 (3) Jewish-American Literature

Explores the Jewish-American experience from the 19th-century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly ENGL 3677.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4677

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Multicultural and Gender Studies

ENGL 4685 (3) Special Topics in American Literature

Explores a special topic in American literature. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American Literature

ENGL 4693 (3) Advanced Topics in British Literature to 1660

Explores a special topic in medieval or early modern literature. May be repeated for a total of 9 units for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: British Literature to 1660

ENGL 4697 (3) Special Topics in Multicultural and Ethnic American Literature

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4692

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4717 (3) Native American and Indigenous Studies Capstone Seminar

Engages a wide range of NAIS methodologies with a series of case studies. Focuses on print, visual, and digital texts encompassing wide swathe of Eurowestern disciplines, while seeking to recuperate and restore Indigenous epistemic practices within our scholarship. Refines students' skills in intellectual debate in the spirit of shared inquiry and challenges research and writing skills.

Requisites: Requires prerequisite course of ETHN 1023 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Multicultural and Gender Studies

ENGL 4820 (3) Honors Seminar

Prepares prospective honors students to write honors theses. Focuses on sharpening the skills needed to write a successful thesis, including research techniques and the ability to evaluate and respond to secondary materials. Required for Honors in English Literature.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course
Departmental Category: General Literature and Language

ENGL 4830 (3) Honors Thesis

Students accepted to English Departmental Honors are enrolled in this course.

Additional Information: Arts Sciences Honors Course
Departmental Category: General Literature and Language

ENGL 4840 (1-3) Independent Study---Upper Division

Creative writing.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: General Literature and Language

ENGL 4850 (1-3) Independent Study---Upper Division

Literature/language.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: General Literature and Language

ENGL 5000 (3) Introduction to Applied Shakespeare

Provides an introduction to the life, work and world of William Shakespeare to prepare students for the Applied Shakespeare Professional Masters Certificate two-week intensive. Students will gain a background in the social, cultural and political context of Renaissance theater, will be introduced to the conventions of Shakespearean drama and will explore key concerns impacting our understanding of Shakespeare's works. Department consent required.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Courses

ENGL 5019 (3) Survey of Contemporary Literary and Cultural Theory

Introduces a variety of critical and theoretical practices informing contemporary literary and cultural studies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5029 (3) British Literature and Culture Before 1800

Introduces graduate level study of medieval and early modern writing through the long eighteenth century. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5059 (3) British Literature and Culture After 1800

Introduces graduate level study of Romantic, Victorian, Modern and Postmodern writing. Emphasizes a wide range of genres, forms, historical background and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5109 (3) Literature and Culture of the United States

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5139 (3) Global Literature and Culture

Introduces graduate level study of recent writing in English from around the world. Emphasizes a wide range of genres, forms, new media, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5169 (3) Multicultural/Postcolonial Studies

Introduces graduate level study of ethnic American and/or postcolonial writing in English, including relevant theoretical discourse. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Cultivates research skills necessary for advanced graduate study. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5199 (3) Studies in Special Topics

Introduces graduate level study of writing of the United States from its inception to the present. Emphasizes a wide range of genres, forms, historical background, and secondary criticism. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5229 (3) Poetry Workshop

Designed to give students time and impetus to generate poetry and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5239 (3) Fiction Workshop

Designed to give students time and impetus to generate fiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5259 (3) Nonfiction Workshop

Designed to give students time and impetus to generate nonfiction and discussion of it in an atmosphere at once supportive and critically serious. Enrollment requires admission to the Creative Writing Graduate Program or the instructor's approval of an application manuscript.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5269 (3) Publishing Workshop

Provides practical experience in the editorial, design, and business procedures of desktop publishing.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5279 (3) Studies in Poetry

Addresses modern poetry, written since World War II.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5299 (3) Studies in Fiction

Addresses modern fiction written since World War II.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5309 (3) Playwriting

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5319 (3) Studies in Literary Movements

Studies styles, trends, innovations and major writers in significant literary movements, particularly those after 1900, such as modernism and postmodernism.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5459 (3) Introduction to the Profession

Introduces purposes, methods and techniques of professional scholarship in English. Provides an overview of the discipline, including traditional areas of research and recent developments. Teaches students how to use research, bibliographic, and reference tools to prepare papers for conferences and publication. Required of all MA students in English.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5529 (3) Studies in Special Topics 1

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: IAWP 6100

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5549 (3) Studies in Special Topics 2

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5559 (3) Studies in Special Topics 3

Studies special topics that focus on a theme, genre, or theoretical issue not limited to a specific period or national tradition. Topics vary each semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 5849 (1-6) Independent Study (Graduate Level 1)

Independent investigation of topics of specific interest to individual students. Students wishing to enroll in independent study must petition the Associate Chair for Graduate Studies prior to the beginning of the semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 6949 (1) Master's Degree Candidate

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Graduate Courses

ENGL 6959 (1-9) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7019 (3) Advanced British Literature and Culture Before 1800

Studies special topics in medieval and early modern writing through the long 18th Century. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7059 (3) Advanced British Literature and Culture After 1800

Studies special topics in romantic, Victorian, modern and postmodern writing. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7119 (3) Advanced Literature and Culture of the United States

Studies special topics in writing of the United States.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7149 (3) Advanced Global Literature and Culture

Studies special topics in recent writing in English from around the world.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7179 (3) Advanced Multicultural/Postcolonial Studies

Studies special topics in ethnic American and/or postcolonial writing in English, including relevant theoretical discourses. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7489 (3) Advanced Special Topics

Studies special topics in theory, culture, and literature of any period. Topics will vary.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to English (ENGL) and English Lit- Creative Writing (CRWR) graduate students only.

Additional Information: Departmental Category: Graduate Courses

ENGL 7849 (1-3) Independent Study (Graduate Level 2)

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Courses

ENGL 8999 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Graduate Courses

English as a Second Language (ESLG) Courses

ESLG 1130 (2) Accent Reduction for Foreign Students

Provides oral activities with authentic English materials to reduce accents and to increase intelligibility for U.S. academic situations. Evaluates individual problem areas and includes one-on-one meetings with the native-speaker instructor. Improves overall articulation and fluency. Does not fulfill humanities or major requirements.

Equivalent - Duplicate Degree Credit Not Granted: ESLG 1210 or ESLG 1410

ESLG 1140 (2) Presentation Skills for International Students

Provides instruction and practice to improve classroom oral communication skills necessary for effective participation in the U.S. academic setting, either as an international TA or RA, graduate or undergraduate student. Evaluates individual problem areas and includes digital audio and video recording with extensive feedback from the native-speaker instructor. Improves oral competence and listening comprehension in English for international students.

Recommended: Prerequisite ESLG 1130.

ESLG 1210 (2) Academic Writing for Foreign Students

Addresses the development of paragraphs and full-length essays. Focus areas include organization and style, grammar and vocabulary and conventions of academic writing, including incorporating the ideas of others and citing sources appropriately. Extensive instructor feedback provided. Improves fluency and precision in academic writing. Does not fulfill humanities or major requirements.

Equivalent - Duplicate Degree Credit Not Granted: ESLG 1130 or ESLG 1410

ESLG 1222 (2) Advanced Written Composition for Foreign Students

Continued practice in academic writing, including incorporating the ideas of others and citing sources appropriately. Extensive instructor feedback provided. Preparation, writing, and revising of a full-length academic term/research paper or work on chapters for a master's thesis or doctoral dissertation. Does not fulfill humanities or major requirements.

Recommended: Prerequisite ESLG 1210.

ESLG 1410 (3) Academic English Skills for International Students

Provides instruction and practice to improve academic speaking and writing skills for effective participation in U.S. universities. Speaking includes accent reduction and effective communication through oral activities and recordings. Writing addresses development of paragraphs and full-length papers, including organization, grammar, vocabulary, incorporating ideas of others and citing sources appropriately. Instructor feedback helps students improve fluency in both speaking and writing. Restricted to non-native speakers of English.

Equivalent - Duplicate Degree Credit Not Granted: ESLG 1130 or ESLG 1210

Entrepreneurial & Small Business Management (ESBM) Courses

ESBM 3100 (3) Introduction to Entrepreneurship

Introduces non-business students to the multiple facets of entrepreneurship and the entrepreneurial process. Entrepreneurship is a process of fundamental transformation: from innovative idea to enterprise and from enterprise to value, entrepreneurship is more than a business practice. Innovation is central to this process and students will be challenged to develop creative solutions to a problem or need.

Requisites: Restricted to non-Business majors with 60-180 units completed.

ESBM 3200 (3) Principles of Business for Entrepreneurs

Provides non-business students with a basic understanding of the business principles required to start and grow an entrepreneurial venture. It is intended for individuals who have not taken a marketing, accounting or finance course. This course will focus on two aspects of business that are critical to the success of any new venture: marketing and financial management.

Requisites: Restricted to non-Business majors with 60-180 units completed.

ESBM 3700 (3) Entrepreneurial Environments

Introduces entrepreneurship. Addresses opportunity recognition, target markets, industry analysis, business model identification, sources of funding, managing rapid growth and writing feasibility studies. Examines alternative forms of entrepreneurship such as franchising, corporate entrepreneurship, family business and social entrepreneurship.

Requisites: Requires prerequisite courses of BCOR 2000 and BCOR 2200 and BCOR 2300 and BCOR 2400 or BCOR 2001 and BASE 2104 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ESBM 4100 (3) Writing a Venture Plan

Requires non-business students to engage in a rigorous, thoughtful and challenging process essential to planning a new venture. Using their own concept, students will develop a strategy to start and grow a venture. Communicating the plan is an essential element of this course and students will learn when and how to write a plan and make effective presentations.

Requisites: Restricted to non-Business majors with 60-180 units completed.

ESBM 4570 (3) Entrepreneurial Finance

Focuses on the financial concepts, issues, methods and industry practices relevant to entrepreneurial decision makers. Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering. Provides an understanding of the segments of the capital markets specializing in start-ups and growth financing.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ESBM 4820 (3) Special Topics in Entrepreneurship**ESBM 4825 (3) Experimental Seminar**

Offered irregularly to provide opportunity for investigation of new frontiers in Entrepreneurship and Small Business Management.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ESBM 4826 (3) Exp. Sem-Social Entrepreneurship: Designing a Better World

See the future through the eyes of entrepreneurs who are addressing global and social environmental problems such as poverty and deforestation. Can the social ventures they create to solve these problems survive over time and will they achieve the impact they seek? We will meet some of these social entrepreneurs and, in teams, write case studies to tell their stories.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4826

Requisites: Restricted to non-Business majors with 60-180 units completed.

ESBM 4830 (3) Entrepreneurship Business Planning and Preparation

Work as part of a small team, with the focus on the process of creating a plan from the business concept and model through all of the elements of a professionally written business plan document.

Equivalent - Duplicate Degree Credit Not Granted: EMEN 4825

Requisites: Requires prerequisite course of ESBM 3700 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

ESBM 4900 (1-3) Projects in Entrepreneurial Companies

Complete projects in preselected entrepreneurial companies. Department consent required.

Environment and Sustainability (ENST)

Courses

ENST 4150 (3) Energy Policy Project

Provides students with an opportunity to apply their knowledge of energy technologies, systems and policies to energy policy issues. Specific topical coverage varies by semester. Example topics include natural gas fracking, automotive fuel economy standards and natural gas exports. Students work in teams to research, prepare and present a detailed and specific energy project proposal. Formerly RSEI 4150.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ENVS 3621.

ENST 5000 (3) Energy Systems and Technologies

Examines the basics of energy technologies and energy delivery systems. Covers both conventional energy sources (oil and gas, coal, nuclear and hydroelectric) and renewable/sustainable energy technologies (wind, solar, biomass, geothermal and end-use efficiency). Investigates individual technologies as well as integration of multiple technologies on energy systems such as the electricity grid and liquid and gas fuels infrastructures. Formerly RSEI 5000.

ENST 5001 (3) Energy Policy in the 21st Century

Examines energy policy and the problem of sustainability through a variety of disciplinary and topical perspectives: historical, political, behavioral, techno-economic and legal. A critical approach is applied to arguments about energy policy processes, systems, and desired outcomes, with special emphasis on the role of renewable and sustainable energy in the changing global energy system. Department enforced prerequisite: an introductory energy science and technology course. Formerly RSEI 5001.

ENST 5002 (3) The Business of Sustainable Energy

Addresses the business of renewable energy, including opportunities and challenges with renewable electricity, renewable transportation fuels and energy efficiency. Topics include energy markets, opportunity identification, life cycle analysis, economic analysis, policy impacts and project financing of sustainable renewable energy business models. Formerly RSEI 5002.

Equivalent - Duplicate Degree Credit Not Granted: BADM 6930

Requisites: Requires prerequisite courses of ENST 5000 and ENST 5001 (all minimum grade D-).

ENST 5100 (1) Renewable and Sustainable Energy Seminar

Examines a wide range of energy issues in seminar format. Students attend energy-related seminars and critique/evaluate the presented material. Open to graduate students from all disciplines. Formerly RSEI 5100.

ENST 5200 (3) Energy Topics Course

Covers timely topics related to renewable and sustainable energy. Specific offerings vary by semester. Formerly RSEI 5200.

Environmental Design (ENVD)

Courses

ENVD 1001 (1) ENVD First-Year Seminar

Transitions first-year ENVD students into college through the process of discovering their path to educational success. Provide opportunities to facilitate learning through peer support groups and curricular integration with the ENVD core classes.

Requisites: Restricted to Environmental Design (ENVD) major or minor students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Social Factors

ENVD 1004 (3) Introduction to Environmental Design Theory

Introduces students to the complexity of forces that interact to shape the designed environment. A lecture sequence and parallel set of design exercises exposes students to the theory and practice of environmental design, and to the important issues that guide the work of architects, landscape architects, urban designers, and urban planners. Open to nonmajors on a space available basis.

Recommended: Corequisites ENVD 1052 and ENVD 2001.

Additional Information: Departmental Category: History and Theory

ENVD 1010 (3) Design Appreciation

Designed for students who are interested in pursuing a degree in design. Provides a foundation for viewing the world through the "eyes" of a designer and gives a broad overview of various design professions including: Architecture, Planning, Landscape Architecture, and Industrial Design through a basic history of design and speculation concerning the future of these professions.

Requisites: Restricted to non-Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: History and Theory

ENVD 1012 (3) Digital Representation Methods for Environmental Design

Guides students through a process of exploration and expression using various digital design and representation techniques common to the disciplines of environmental design. This course seeks to demystify contemporary practices in digital design methods and propels students into this discourse with ongoing experimentation in digital design media. It will expose students to Adobe Creative Suite, AutoCAD and SketchUp.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Methods and Techniques

ENVD 1052 (3) Design and Communication 1

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by emerging digital techniques for the depiction of designed artifacts and environments, allowing students to extend and enhance their understandings of advanced practices for design visualization, representation and communication.

Recommended: Corequisites ENVD 1004 and ENVD 2001.

Additional Information: Departmental Category: Methods and Techniques

ENVD 1102 (3) Design and Communication 2

Using both lectures and drawing exercises, this class extends understandings of the representational conventions used by the design professions through its introduction to the possibilities offered by traditional techniques for the advanced practices for design visualization, representation, and communication.

Requisites: Requires prerequisite course of ENVD 1052 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisites ENVD 1104 and ENVD 2003.

Additional Information: Departmental Category: Methods and Techniques

ENVD 1104 (3) Introduction to Environmental Design Methods

Explores the forces and conditions that interact to shape the designed environment. It does so through a lecture sequence and parallel set of design exercises introducing students to the theory and practice of environmental design. It develops student understandings of the central role design thinking plays as the unique process used to effect appropriate change in the designed environment.

Recommended: Corequisites ENVD 1102 and ENVD 2003.

Additional Information: Departmental Category: History and Theory

ENVD 2001 (3) Human Behavior in Design and Planning

Examines reciprocal relationships between people and their built and natural environments, tracing major issues and approaches in design research to understand how people are influenced by the environment and how they can create healthy, just, and livable places.

Recommended: Corequisites ENVD 1004 and ENVD 1052.

Additional Information: Departmental Category: Social Factors

ENVD 2003 (3) Ecology and Design

Introduces basic principles and techniques of ecology as they relate to the design and understanding of the built environment. Includes a study of hazards and the impact of modern technology on the natural and built environments.

Recommended: Corequisites ENVD 1102 and ENVD 1104.

Additional Information: Departmental Category: Physical Factors

ENVD 2120 (6) Environmental Design Studio 1

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

Requisites: Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisite ENVD 3115.

Additional Information: Departmental Category: Studios

ENVD 2130 (6) Environmental Design Studio 2

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of architecture, urban design and landscape design - disciplines that share the responsibility for shaping the designed environment.

Requisites: Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisite ENVD 3003.

Additional Information: Departmental Category: Studios

ENVD 3003 (3) Site Planning

Introduces the site planning process including: site analysis and its relationship to building program and site concept, and preparation of site plans. Emphasis is placed on the planning of the physical site through a thorough understanding of process, land use, site constraints and synthesis of ecological, functional and aesthetic considerations in the site planning process.

Recommended: Corequisite ENVD 2130.

Additional Information: Departmental Category: Physical Factors

ENVD 3009 (1-6) Special Topics in Environmental Design

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topic class.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites ENVD 1004 and ENVD 1052.

Additional Information: Departmental Category: Miscellaneous

ENVD 3052 (3) Introduction to Computer Methods in Environmental Design

Surveys existing and emerging computer methods used in the environmental design professions, with an introduction to computer programming. Open to nonmajors with instructor consent.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3100 (6) Environmental Design Studio 3

Exposes students to a sequence of design investigations that lead to the development of design concepts for critical evaluation and discussion.

The intent of this introductory design studio is to expose students to the fundamental design practices that are common to the disciplines of environmental design, planning, urban design and landscape design - that share the responsibility for shaping the designed environment.

Requisites: Requires prerequisite course of ENVD 2120 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Recommended: Corequisite ENVD 3122.

Additional Information: Departmental Category: Studios

ENVD 3114 (3) History and Theory of Environmental Design at the Small Scale: Buildings

Focusing on buildings, this class surveys the built environment from the beginning of time through the present day. Emphasizing developments in the western world, it develops students' recognition of major styles, influential people, and drivers of building form.

Additional Information: Departmental Category: History and Theory

ENVD 3115 (3) Introduction to Building Materials and Systems

Surveys building methods, materials and assemblies from the designer's perspective.

Recommended: Corequisite ENVD 2120.

Additional Information: Departmental Category: Technology and Practice

ENVD 3122 (3) Research Issues and Methods in Design and Planning

Explores topics of current interest in planning. Looks at the development and social consequences of the neighborhood movement, forms of municipal and regional governments, regional settlement patterns, and new communities. Introduces selected methods from the social sciences used by planners and urban designers.

Recommended: Corequisite ENVD 3100.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3134 (3) History and Theory of Environmental Design and the Medium Scale: Precincts

Focuses on design projects not in a building envelope, including landscapes, public and private urban spaces, complexes and similarly scaled design projects. Aspects of architectural and planning thinking are interwoven in a landscape concentration.

Additional Information: Departmental Category: History and Theory

ENVD 3144 (3) History and Theory of ENVD: Systems

Provides an introduction to the history of urban planning and design practices and processes. Examines the history of city-building using examples drawn from the United States as well as other countries.

Emphasis is on developing analytical methods and a critical approach in discussing and evaluating historical and contemporary planning issues, mechanisms and cases.

Additional Information: Departmental Category: History and Theory

ENVD 3152 (3) Introduction to Computer Graphics Applications

Explores principles and uses of computer graphics in design. Topics include creation and modification of complex two- and three-dimensional objects; orthographic and perspective views; use of color; input using mouse and digitizer; output using screen, plotter, matrix printer, and slides; automated aids for form generation and manipulation; and analysis of current and future trends of computer usage for design.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3200 (1-6) Advanced ENVD Studio

Design studio dealing with problems at an intermediate level of complexity: emphasis is on the interaction of form, use, and multiple values and technologies in conjunction with issues and techniques drawn from other content area courses of the curriculum.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Program in Environmental Design major or minor students only.

Recommended: Prerequisite ENVD 2130.

Additional Information: Departmental Category: Studios

ENVD 3212 (3) Color Theory

Illustrates color media techniques for the preparation, composition, and presentation of landscape and built environment drawings.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3252 (3) Computer Graphic Programming

Provides an introductory computer programming course designed to teach the capabilities of a computer in providing graphic representations of environments, including buildings. Open to nonmajors.

Additional Information: Departmental Category: Methods and Techniques

ENVD 3300 (3-6) Special Topics: Intermediate Design Lab

Design lab exploring new and emerging themes in environmental design.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 3909 (1-6) Independent Study

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Additional Information: Departmental Category: Miscellaneous

ENVD 3919 (1-6) Teaching Assistant

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

ENVD 3929 (1) Peer Leadership and Mentorship and Transitioning Students

Designed to explore the student transition to university life and engage students in active leadership and mentoring capacity-building activities. Examines the role peers play in leading students through transitional development. Students will learn the theoretical basis for understanding student transition and develop their mentoring capacities as well as examine personal identity and values and its intersection with leadership and mentorship.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

Additional Information: Departmental Category: Miscellaneous

ENVD 3939 (3) Exploratory Internship

Offers professional experiences allowing students to discover a variety of design-related environments such as community engagement, non-profit work or assisting research. In addition to the internship experience, students attend four classroom sessions providing professional development exercises. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENVD 1102 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) Program in Environmental Design majors only.

Recommended: Prerequisite 2.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

ENVD 4009 (1-6) Special Topics in Environmental Design

Provides a seminar or design lab on special issues in environmental design, including study abroad. Variable topics.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ENVD 2120.

Additional Information: Departmental Category: Miscellaneous

ENVD 4023 (3) Environmental Impact Assessment

Provides a field-oriented seminar in current environmental impact controversies. Gives attention to history, theory, and application of impact analysis at state levels for designers, land-use planners, and others involved in resource decision making. By instructor consent, open to nonmajors on a space available basis.

Additional Information: Departmental Category: Physical Factors

ENVD 4035 (3) Solar and Sustainable Design

Introduces aspects of solar technology relevant to the environmental design professions. Includes readings and lectures on the nature of energy limitations, energy needs, and the potential role of solar energy in meeting these needs.

Additional Information: Departmental Category: Technology and Practice

ENVD 4052 (3) Digital Presentation and Portfolio

Introductory course creating interactive web sites. Covers use of Hypertext Markup Language (HTML) and Flash to create linked pages containing text, images animations, menus, and buttons. Covers principles of site navigation, page layout, and graphic design for designers and planners.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4100 (3-6) Advanced Design Lab 1

Design lab exploring new and emerging themes in design.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3300 (minimum grade C-).

Additional Information: Departmental Category: Studios

ENVD 4112 (3) Architectural Graphics 1

Illustrates techniques of graphics communication and presentation for architectural design. Includes advanced delineation and use of color.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4122 (3) Digital Photo for Designers

Explores digital photographic workflow from capture to exhibition. Students gain the ability to document their projects and utilize photography as a means of creative expression. Topics include: using DSLRs, Adobe Lightroom, retouching with Adobe Photoshop, time-lapse photography, Adobe Premier, professional printing, landscape and architectural photography, sharing work through blogs and social media, and submitting work for publication and exhibition.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4152 (3) Computer Graphic Applications

Introduces the mechanics of entering 2-D images and 3-D objects into the computer. Once entered, graphics are interactively rotated in space, walked through, and displayed in perspective from any position. Also covers the mechanics of other computer programs allowing additional manipulation of images and objects.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4212 (3) Architectural Graphics 2

Covers development of an architectural set of construction documents combined with job administration, field observation, and guest speakers from related construction and architectural disciplines.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4300 (3-6) Advanced Design Lab 2

Design lab exploring new and emerging themes in design.

Repeatable: Repeatable for up to 18.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 4100 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 4311 (3) Housing Policies and Practices

A seminar providing students with a descriptive knowledge and analytical understanding of the use and development of residential settings in different political economies, globally divided into advanced capitalist nations, collectivist economies, and the third world.

Additional Information: Departmental Category: Social Factors

ENVD 4322 (1-6) Special Topics: Graphics

Provides an advanced seminar on special issues in design communications. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4340 (4-6) Landscape Design Studio

Studio in landscape design.

Requisites: Requires prerequisite course of ENVD 3300 (minimum grade C-). Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 4352 (1-6) Special Topics: Computer Methods

Topics include animation and environmental simulation, computational methods of technical evaluation and optimization, and computational mapping and analysis. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Methods and Techniques

ENVD 4361 (1-6) Special Topics: Social Factors in Design

Addresses variable topics in the relationship of human experience and behavior to the built environment, e.g., social research methods in environmental design.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Social Factors

ENVD 4363 (1-6) Special Topics: Physical Factors in Environmental Design

Includes such topics as appropriate technology, public policy and natural hazards, organization of the designing and building process, and physical elements of urban development.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Physical Factors

ENVD 4364 (1-6) Special Topics: History and Historiography of Environmental Design

Provides an advanced seminar on history and historiography of environmental design, e.g., American dwellings. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: History and Theory

ENVD 4365 (1-6) Special Topics: Technology and Practice

Provides an advanced seminar on new technologies and issues of professional practice in the environmental design professions.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Technology and Practice

ENVD 4420 (3) Senior Capstone Seminar

Advanced seminar focuses on theoretical concerns and practical issues inherent in environmental design and planning. Views concerns and issues in terms of setting, processes, and planning and design outcomes. Provides a critical synthesis of the inherently interdisciplinary nature of planning and design education.

Requisites: Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: Studios

ENVD 4440 (6) Landscape Design Studio 2

A preprofessional studio in landscape architecture.

Requisites: Requires prerequisite course of ENVD 4340 (minimum grade C-).

Additional Information: Departmental Category: Studios

ENVD 4764 (1-6) Special Topics: Theory and Criticism in Environmental Design

Provides an advanced seminar on theory and criticism in environmental design, e.g., architecture now and introduction to design theory and criticism. May be repeated for credit by petition.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: History and Theory

ENVD 4794 (3) History of Urban Design and Planning

Examines history of European and American planning and urban design in the late 19th and 20th centuries.

Requisites: Restricted to Program in Environmental Design major or minor students only.

Additional Information: Departmental Category: History and Theory

ENVD 4909 (1-6) Independent Study

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Additional Information: Departmental Category: Miscellaneous

ENVD 4919 (1-6) Teaching Assistant

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

ENVD 4929 (1-6) Research Assistant

By special arrangement with instructor. 00 GPA.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-).

Recommended: Prerequisite 3.

Additional Information: Departmental Category: Miscellaneous

ENVD 4939 (3) Professional Design Internship

Allows students to develop design and professional skills outside of the curriculum while working for an architecture, landscape architecture or planning firm. In addition to the internship experience, students attend four classroom sessions providing professional development exercises. 00 GPA.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENVD 3100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Program in Environmental Design majors only.

Recommended: Prerequisite 3.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

ENVD 4972 (3) Honors Research Methods and Thesis Preparation

To prepare students for undertaking an independent research or design project in Environmental Design, this asks students to engage with existing literature in the field. Students will understand how research and design projects are conducted, and how their own work fits within a long tradition of scholarship. Department consent required.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Miscellaneous

ENVD 4979 (3) Honors Thesis

Working with an advisor, students prepare, complete, and defend an honors thesis project, either written or creative.

Requisites: Restricted to students with 57-86 credits (Junior).

Additional Information: Departmental Category: Miscellaneous

ENVD 5346 (1-6) Spec Topics: Environmental Design

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

ENVD 7909 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

Environmental Engineering (EVEN) Courses

EVEN 1000 (1) Introduction to Environmental Engineering

Introduces first-year students to the environmental engineering program from an academic and a career perspective. Covers air quality, applied ecology, chemical processing, energy, engineering for developing communities, environmental remediation, and water resources and treatment. Includes reading and writing on the history of environmental engineering, major environmental issues, and professional ethics.

Requisites: Restricted to students with 0-60 units completed. Restricted to Environmental Engineering (EVEN) majors only.

EVEN 1001 (3) Environmental Engineering 101: An Introduction to Pollution Science

Surveys the science and engineering needed to understand the environmental and energy challenges which face urbanizing society: air and water pollution, climate change, and mining. Introduces how environmental engineers leverage basic science concepts to reduce pollution and optimize energy use. Analyzes how the mainstream media presents the environmental science of climate change and modern environmental disasters.

EVEN 2840 (1-3) Independent Study: General Topics

General topics relating to environmental engineering. One-on-one assistance with an instructor.

EVEN 3350 (3) Sustainability Principles for Engineers

An introduction to sustainability principles in the field of environmental engineering. Students will apply these principles to engineering problems in order to evaluate the environmental, economic and social implications of engineering and design decisions. Topics include definitions of sustainability, main engineering sustainability challenges (e.g., water, climate and materials), pollution generation and prevention and sustainability assessment tools.

Requisites: Requires a corequisite course of CVEN 3414. Restricted to Environmental Engineering (EVEN) majors only.

Grading Basis: Letter Grade

EVEN 4100 (3) Environmental Sampling and Analysis

Introduces students to techniques for characterization of surface water, subsurface water, soils and sediments, and air and planning of sampling and analysis efforts. Laboratories include stream sampling, drilling, monitoring well installation, water level, slug tests, air sampling.

Requisites: Requires prerequisite courses of CVEN 4404 and CVEN 4424 (all minimum grade C-). Restricted to Environmental Engineering (EVEN) majors only.

EVEN 4404 (3) Water Chemistry

Introduces chemical fundamentals of inorganic aqueous compounds and contaminants in lecture and laboratory. Lecture topics include thermodynamics and kinetics of acids and base reactions, carbonate chemistry, air-water exchange, precipitation, dissolution, complexation, oxidation-reduction and sorption.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4404

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 and CVEN 3414 (all minimum grade C-). Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

Grading Basis: Letter Grade

EVEN 4414 (1) Water Chemistry Laboratory

Reinforces chemical fundamentals of inorganic aqueous compounds and contaminants from EVEN 4404 in laboratory experiments and reports. Topics include acids and bases, carbonate chemistry (alkalinity) and other water chemistry characteristics (hardness, dissolved oxygen); precipitation, complexation and oxidation-reduction reactions; and laboratory techniques and reporting.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4414

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 and CHEM 1133 (all minimum grade C-). Requires corequisite course of EVEN 4404. Restricted to Civil (CVEN) or Environmental (EVEN) Engineering majors only.

Grading Basis: Letter Grade

EVEN 4424 (3) Environmental Organic Chemistry

Examines the fundamental physical and chemical transformations affecting the fate and transport of organic contaminants in natural and treated waters. Emphasizes quantitative approach to solubility, vapor pressure, air-water exchange, sorption, hydrolysis and redox reactions, and photodegradation.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4424

Requisites: Requires prerequisite course of CHEN 1211 or CHEM 1113 or CHEM 1271 (minimum grade C-).

Grading Basis: Letter Grade

EVEN 4434 (4) Environmental Engineering Design

Examines the design of facilities for the treatment of municipal water and wastewater, hazardous industrial waste, contaminated environmental sites and sustainable sanitation in developing countries. Economic, societal and site specific criteria impacting designs are emphasized.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4434

Requisites: Requires prerequisite course of CVEN 3414 (minimum grade C-).

Grading Basis: Letter Grade

EVEN 4464 (3) Environmental Engineering Processes

Develops and utilizes analytic solutions for environmental process models that can be used in a) reactor design for processes used in the treatment of water, wastewater and hazardous waste and b) process analysis of natural systems, such as streams and groundwater flow. Models facilitate the tracking of contaminants in engineered and natural systems.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4464 and CVEN 5464

Requisites: Requires prerequisite courses of CVEN 3313 or CHEN 3200 or GEEN 3853 or MCEN 3021 or AREN 2120 and CVEN 3414 (all minimum grade C-).

Grading Basis: Letter Grade

EVEN 4484 (3) Introduction to Environmental Microbiology

Surveys microbiology topics germane to modern civil and environmental engineering. Provides fundamentals needed to understand microbial processes and ecology in engineered and natural systems and reviews applications emphasizing the interface between molecular biology and classical civil engineering.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 4484

Requisites: Requires prerequisite course of CHEN 1211 (minimum grade C-).

Grading Basis: Letter Grade

EVEN 4830 (3) Special Topics

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

EVEN 4840 (1-3) Independent Study: General Topics

General topics relating to environmental engineering. One-on-one assistance with an instructor.

Repeatable: Repeatable for up to 6.00 total credit hours.

EVEN 4980 (3) Senior Thesis 1

Provides faculty-supervised independent research in environmental engineering for students planning to complete a senior thesis. To be taken prior to EVEN 4990, during the final year before graduation. Department consent required.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Environmental Engineering (EVEN) majors only.

EVEN 4990 (3) Senior Thesis 2

Continuation of EVEN 4980. Consists of final phase of faculty-supervised research, the preparation of a written thesis, and an oral defense of the research to

Requisites: Requires prerequisite course of EVEN 4980 (minimum grade C-).

EVEN 6940 (1) Master's Candidate for Degree

Grading Basis: Pass/Fail

EVEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

EVEN 8990 (1-10) Doctor's Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Environmental Studies (ENVS) Courses

ENVS 1000 (4) Introduction to Environmental Studies

Surveys environmental studies, examining ecological, socioeconomic, political, aesthetic, and technological factors that influence the quality of life on Earth. Required for ENVS majors.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 1001 (4) Introduction to Developing Environmental Solutions

Builds on ENVS 1000 to give students greater understanding of how to approach environmental issues and work toward solutions. Integrates all focal areas of ENVS - sciences, policy, values - with greatest emphasis on learning science, data analysis and critical thinking fundamentals. Uses case studies of local issues to provide context for skill building and synthesis.

Requisites: Requires a prerequisite course of ENVS 1000 (minimum grade C-).

Grading Basis: Letter Grade

ENVS 1150 (3) First-Year Writing in Energy, Environment and Sustainability

Provides development of effective writing skills, knowledge and habits for success in the campus culture using topics related to the environmental sciences, energy, sustainability and academic/career interests. Focuses on the processes in rhetoric, emphasizing skills in creative, analytical and critical thinking, as well as research and presentation using digital and "old fashioned" methods and materials.

Requisites: Restricted to Environmental Studies (ENVS) or Environmental Design (ENVD) majors only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Written Communication

ENVS 2000 (4) Applied Ecology for Environmental Studies

Covers how ecological ideas and principles underlie both the problems and solutions of multiple environmental issues. Ecology of environmental concerns ranging from endangered species to global carbon cycling will be reviewed, including perspectives from physiological, behavioral, population, community and ecosystem ecology. Fulfills intermediate natural science requirement for Environmental Studies major.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 2040 and EBIO 2640

Recommended: Prerequisites ENVS 1000 and a course in introductory statistics and two courses in introductory biology or physical geography.

ENVS 2001 (3) Topical Seminar in Environmental Studies

Serves as an introductory seminar to topics in environmental studies. Topics are diverse and include such areas as climate and conflict, food production, land use change, and other emerging areas in environmental studies.

Grading Basis: Letter Grade

ENVS 2100 (2-4) Topics in Applied Environmental Studies

Covers a variety of topics not currently offered in the curriculum: offered depending on instructor availability and student demand. Fulfills application requirement in Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 2840 (1-6) Independent Study

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 3001 (3) Sustainable Solutions Consulting

Introduces students to green design, industrial ecology, and life cycle analysis. Students use basic techniques of environmental auditing to analyze the CU Boulder campus. Fulfills application requirement for Environmental Studies major.

Requisites: Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

Recommended: Requisite any two-semester science sequence.

ENVS 3020 (3) Advanced Writing in Environmental Studies

Offers training in critical thinking and analytical writing skills appropriate to upper-division classes. Writing assignments integrate the subject matter of different topical areas. Fulfills writing requirement for Environmental Studies major.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

Recommended: Prerequisite ENVS 1000.

Additional Information: Arts Sci Core Curr: Written Communication

ENVS 3022 (3) Climate Politics and Policy

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3022

Recommended: Prerequisite ENVS 1000 or GEOG 1972.

ENVS 3030 (3-4) Topics in Environmental Social Sciences

Covers a variety of topics that may include human ecology, environment and society, and quantitative environmental social science. Offered depending upon instructor availability and student demand. Fulfills intermediate social science requirement for Environmental Studies major. Not repeatable for credit.

Recommended: Prerequisite ENVS 1000.

ENVS 3031 (3) Energy and Human Behavior

Examines why people behave the way they do as it relates to energy use and support for energy/climate policy. Addresses questions such as: what motivates people to conserve energy? Why don't people invest in energy efficiency, even when it saves them money? How do you promote pro-environmental behavior? Fulfills intermediate social science requirement for ENVS major.

Recommended: Prerequisite ENVS 1000.

Grading Basis: Letter Grade

ENVS 3032 (3) Environment, Media and Society

Examines how mass media influence our society, specifically with regard to environmental issues and outcomes. Focuses on media influence over environmental politics and policy, environmental public opinion, popular culture, and environmental/scientific knowledge. Fulfills intermediate social science requirement for Environmental Studies major.

Recommended: Prerequisite ENVS 1000.

ENVS 3040 (4) Conservation Biology

Applies principles of population ecology, population genetics, biogeography, animal behavior, and paleobiology to the maintenance of biodiversity and natural systems. The resulting theory is then applied to conservation policy and management techniques.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 3040

Recommended: Prerequisite EBIO 2040 or EBIO 2640.

ENVS 3064 (3) Environmental Political Theory

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3064

Additional Information: Arts Sci Core Curr: Ideals and Values

ENVS 3070 (3) Energy and the Environment

Examines contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Includes some basic physical concepts and principles that often constrain choices. No background in physics is required.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 3070

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 3100 (2-4) Topics in Applied Environmental Studies

Covers a variety of topics not currently offered in the curriculum; offered depending upon instructor availability and student demand. Fulfills application requirement for Environmental Studies major.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 3103 (3) Applied Environmental Studies: Mining in Four Corners

Explores mining related issues that have pronounced impact on the environment, economy and politics of the Four Corners region. Students apply their basic knowledge of environmental science, policy and values toward the understanding of and productive discourse about the conflicts and opportunities brought about by the mining industry in the Four Corners region. Course includes a seven day field trip, visiting mining and reclamation sites in New Mexico, Utah and Colorado. Fulfills application requirement for Environmental Studies majors.

Recommended: Prerequisite ENVS 1000 and one year natural science.

ENVS 3140 (3) Environmental Ethics

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 3140

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

ENVS 3173 (3) Creative Climate Communication

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 3173 and THTR 4173

Recommended: Prerequisite ENVS 1000.

ENVS 3434 (3) Introduction to Applied Ecology

Emphasizes the integration of physical, chemical and biological processes in controlling terrestrial and aquatic ecosystems. Ecosystem concepts are applied to current environmental and water quality problems. Includes field trips and a group project.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 3434

Requisites: Requires prerequisite courses of CHEM 1113 or CHEN 1211 and CHEM 1221 (all minimum grade D-).

ENVS 3520 (3) Energy and Climate Change: An Interdisciplinary Approach

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3520

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite a two-course sequence in any natural science.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 3525 (3) Intermediate Environmental Problem Analysis: Topical Cornerstones

Engages students in in-depth study of a topic such as climate change, energy, natural resources or sustainability. Through lectures, discussions, readings and activities, students will become conversant with how science, policy and values are integrated in environmental problem solving, and develop their own sense of how to critically engage with proposed solutions. Fulfills cornerstone requirement for Environmental Studies Major. Recommended corequisite: ENVS 3020.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 3600 (3) Principles of Climate

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3601 and ATOC 3600

Recommended: Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

ENVS 3621 (3) Energy Policy and Society

Examines how society makes decisions about energy, and how these decisions affect the environment and the economy. Uses tools from policy analysis, economics, and other disciplines to build an in-depth understanding of energy's role in U.S. contemporary society. Fulfills Cornerstone requirement of ENVS majors. Recommended corequisite: ENVS 3020.

Recommended: Prerequisites ENVS 1000 and ENVS 3070 or PHYS 3070.

ENVS 3640 (3) Data Analysis for Global Environmental Affairs

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3640

Grading Basis: Letter Grade

ENVS 3800 (3) The Art of Research: The Essential Elements of Research in Environmental Studies

Introduces students to the practice of doing research in environmental studies. Examines how to define a research problem, select methods, design research, construct arguments and evaluate others' research. Aims to familiarize students with the process of doing research and enable them to proceed with confidence in pursuing their own research topics. Recommended for juniors planning to write ENVS honors theses. Fulfills capstone requirement in Environmental Studies major.

Requisites: Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

Recommended: Prerequisite ENVS 3020.

ENVS 3930 (1-3) Internship

Relates classroom theory to practice. Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to students' career goals. Fulfills application requirement in Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ENVS 1000.

ENVS 4027 (3) Inequality, Democracy, and the Environment

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. The course also focuses on the role that global inequality plays in fostering environmental degradation.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4027

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ENVS 4030 (3) Sociology of Climate Change

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4030

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

ENVS 4050 (2-4) Field Methods in Ecosystem Science

Studying the relationships among organisms, physical features, biogeochemistry and humans in ecological communities - this is ecosystem science. This course provides conceptual understanding and practical experience conducting research. Students will pose their own scientific questions, learn several field and lab methods, analyze data and design a project. Upon completion, they will have useful skills for internships, jobs and graduate school. Fulfills application requirement in ENVS major. Department enforced prerequisite: ENVS 1000 or two semesters of natural sciences; such as chemistry, geology or biology.

Grading Basis: Letter Grade

ENVS 4100 (3) Special Topics in Environmental Studies

Various topics not normally covered in the curriculum: offered depending on student demand and specialties of faculty. Applied to specialization requirement for Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ENVS 4120 (4) Special Topics in Environmental Studies

Various topics not normally covered in the curriculum; offered depending on student demand and specialties of faculty. Applies to specialization requirement for Environmental Studies major.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

ENVS 4160 (3) Introduction to Biogeochemistry

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4160 and GEOL 4160

Requisites: Requires prerequisite courses of GEOL 3320 or EBIO 3270 and CHEM 1011 (all minimum grade D-).

ENVS 4201 (3) Biometeorology

Introduces this interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans). Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4201

Requisites: Requires a prereq course of GEOG 1001 and APPM1340 and 1345 or APPM1350 or ECON1088 or MATH1081 or 1300 or 1310 or 2510 or ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or PSCI2075 or PSYC3101 or SOCY2061 or 4061 (min grade D-).

ENVS 4340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5340, EBIO 4340 and EBIO 5340

Recommended: Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

ENVS 4795 (3) Field Methods in Zoology and Botany

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4795 and MUSM 5795

ENVS 4800 (3) Capstone: Critical Thinking in Environmental Studies

Examines a specific environmental topic in depth, synthesizing information from complex and controversial issues. Different course sections present different topics. Fulfills capstone requirement for Environmental Studies major.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) or Geography (GEOG) majors only.

Recommended: Prerequisites ENVS 1000 and ENVS 3020.

ENVS 4840 (1-6) Independent Study

Students work with an approved faculty sponsor to explore a topic in greater depth and to pursue an interest that is not offered in the formal curriculum.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite ENVS 1000.

ENVS 4990 (3) Senior Thesis

Supervised project involving original research. Thesis proposal must be accepted by honors chairman. Open only to Environmental Studies majors with at least a 3.30 GPA. Fulfills capstone requirement in Environmental Studies major.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of ENVS 1000 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Environmental Studies (ENVS) majors only.

Recommended: Prerequisite ENVS 3020.

ENVS 5000 (3) Policy, Science, and the Environment

Introduction to methodologies of the policy sciences with emphasis on applications to environmental issues; role of science in decision making; professional roles and responsibilities as a policy analyst.

Requisites: Restricted to Environmental Studies (ENVS) graduate students only.

ENVS 5003 (3) Theory and Methods in Environmental Studies

Introduces students to theory and methods used in research on environmental science, values and policy. The goal of the course is to provide a broad overview of the conceptual background relevant to work and research in environmental studies, with an emphasis on understanding the similarities and differences in research methods used in different disciplines and in environmental research.

Grading Basis: Letter Grade

ENVS 5050 (3) Theories of the Policy Process

Examines the public policy process, including the influences and actors that shape policy outcomes. Focuses on the major theories, frameworks, and models of policy change, along with emerging scholarship that challenges, refines, and advances the theory.

Requisites: Restricted to graduate students only.

ENVS 5100 (1-3) Special Topics in Environmental Studies

A variety of topics not currently offered in curriculum; offered depending on instructor availability and student demand.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

ENVS 5110 (1-3) Topics in Environmental Social Science and Humanities

Covers various topics in the social sciences and humanities in environmental studies.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

ENVS 5120 (1-3) Topics in Quantitative Methods

Covers a wide range of quantitative methods used in policy research and their applications. Topics may include decision-making under uncertainty, fundamentals of microeconomics, mathematics of economic efficiency, cost-benefit analysis, system optimization, budgeting, fundamentals or probability, risk assessment, risk perception, risk communication, and decision analysis. Includes practical exercises, as well as readings and discussion, of various strengths and weaknesses of the different methods.

Repeatable: Repeatable for up to 9.00 total credit hours.

ENVS 5240 (3) Environmental Philosophy

A survey of the major philosophical issues in environmental studies, comprising key issues in environmental ethics, in environmental political philosophy and in the philosophy of biology and ecology.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5240

Requisites: Restricted to Environmental Studies (ENVS) graduate students only.

ENVS 5340 (4) Conservation Biology and Practice in Brazil's Atlantic Forest

Field Studies. Examines the application of conservation principles in the Atlantic Forest of Brazil, a 'biodiversity-in-crisis' setting. Explores successful conservation strategies integrated with efforts to alleviate socioeconomic issues. Three-week Maymester, Study Abroad Global Seminar.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4340, EBIO 4340 and EBIO 5340

Recommended: Prerequisites EBIO 2040 or ENVS 2000 or 2000/higher-level course in ANTH, EBIO, ENVS, EVEN, GEOG, IAFS or other discipline related to ecology or sustainability.

Grading Basis: Letter Grade

ENVS 5510 (1) Environmental Studies Colloquia Series

All first year ENVS graduate students are required to attend the ENVS Colloquia Series. Speakers from around the world and within the department cover topics in all areas of Environmental Studies.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

ENVS 5520 (1-3) Seminar in Environmental Studies

Addresses current topics in Environmental Studies. Provides forum for students to critically evaluate the primary literature on a particular theme.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

ENVS 5701 (3) Policy, Politics and Management: Foundations

Examines concepts related to policy and regulatory processes, institutions and management of the environment and natural resources. Explores environmental laws at the international, national, state and local levels as well as how the processes and institutions at various levels of government help shape laws and their implementation. Focuses on policy tools including property rights, regulation, voluntary compliance and market-based mechanisms.

Grading Basis: Letter Grade

ENVS 5702 (3) Policy, Politics and Management: Theory and Practice

Provides an overview of the theoretical landscape for how policies are made, decisions are enacted and actors seek to influence policy and political outcomes. Students will learn tools of policy analysis and apply their understanding to cases of environmental, natural resource and related policies.

Grading Basis: Letter Grade

ENVS 5740 (3) Context-Sensitive Research Methods

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7116

Requisites: Restricted to graduate students only.

ENVS 5810 (3) Water Resources and Environmental Sustainability

Assesses impacts of climate variability and regional growth on western U.S. water resources, and examines successes and failures of different management strategies, as well as ways that science is used and misused in support of water management.

Requisites: Restricted to Arts and Sciences, Journalism, Law or Business Graduate Students only.

ENVS 5820 (3) Energy Policy in the 21st Century

Examines energy policy and the problem of sustainability through a variety of disciplinary and topical perspectives: historical, political, behavioral, techno-economic and legal. A critical approach is applied to arguments about energy policy processes, systems and desired outcomes, with special emphasis on the role of renewable and sustainable energy in the changing global system.

Requisites: Restricted to graduate students only.

ENVS 5830 (3) Critical Issues in Climate and the Environment

Discusses current issues such as ozone depletion, global warming and air quality for graduate students in nonscientific fields. Provides the scientific background necessary to understand, follow scientific developments and critically evaluate these issues.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 4800 and ATOC 5000

ENVS 5840 (3) Global Biogeochemical Cycles

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed, along with global-scale measurements of element fluxes from satellites, aircraft and measurement networks.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5305

Requisites: Restricted to graduate students only.

Recommended: Prerequisite general chemistry, some organic chemistry.

ENVS 5909 (1-3) Independent Study

Only 3 hours of independent study can be used towards degree requirements.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ENVS 5930 (2) Internship

Provides academically supervised opportunities for environmental studies majors to work in public and private organizations on projects related to the students' research and career goals, and to relate classroom theory to practice.

ENVS 6007 (3) Foundations of Environmental Sociology

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 6007

ENVS 6201 (3) Qualitative Research Methods for Environmental Studies

Introduces students to research design, data collection and analysis methods. Exploration of the rationale underlying the use of various methods, the skills needed to employ qualitative method and the process of designing a research protocol will provide graduate students with a sound foundation to begin their own thesis research.

Grading Basis: Letter Grade

ENVS 6222 (2-3) Environmental Decision-Making

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7222

Grading Basis: Letter Grade

ENVS 6301 (3) Environmental and Energy Economics

Introduces non-economists to the study of energy markets, environmental externalities, economic regulation and public policy. This applied course uses examples from electricity generation, renewable energy, manufacturing, transportation and other energy intensive industries. A variety of policy instruments will be studied, including: technology standards, subsidies, environmental mandates, rate-based policies, emissions taxes and cap-and-trade systems.

Grading Basis: Letter Grade

ENVS 6302 (3) Sustainable Landscapes, Sustainable Livelihoods

Examine adaptation of rural and resource dependent regions and communities in response to cultural, economic and environmental change. Students will evaluate different approaches for sustainable management of forests, ranches, farms and wildlands and to balance diverse livelihood needs and environmental stewardship in a time of rapid change. Students will learn techniques to gather and synthesize data that support solution development.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ENVS 6303 (3) Transportation and Sustainable Cities

Examines the problem of organizing transportation systems from a variety of perspectives and explores how transportation decisions get made at a variety of scales, from local to national. Covers some of the dramatic changes coming from technological innovation in arenas like vehicle electrification, autonomous vehicles and the potential shift from individual vehicle ownership to shared mobility.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

ENVS 6304 (3) Introduction to Food Systems Internationally

Introduces students to contemporary food system challenges at the global scale, the course will first identify key historic and projected trends, to set the scene for the remainder of this specialization. Second it will draw on international case studies to explore some of the institutional, technological and market responses to food system challenges across the globe.

Grading Basis: Letter Grade

ENVS 6305 (3) Food System Solutions? Evaluation of Food System Debates

Using the best available evidence, students will critically evaluate how food system sustainability may be enhanced by proposed solutions, such as genetically engineered food, organic foods, local food systems, dietary changes and reductions in food waste. Explores the environmental implications of these potential solutions and the opportunities for them to gain traction and become more mainstream.

Grading Basis: Letter Grade

ENVS 6940 (1) Master's Degree Candidacy

Grading Basis: Pass/Fail

ENVS 6950 (1-6) Master's Thesis**ENVS 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Ethnic Studies (ETHN)

Courses

ETHN 1022 (3) Introduction to Africana Studies

Overview of Africana studies as a field of investigation, its origins and history.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Africana Studies

ETHN 1023 (3) Introduction to Native American and Indigenous Studies

Introduces critical terms, issues, and questions that inform the discipline of American Indian Studies. Examines "historical silences" and highlights how American Indian scholars, poets, and filmmakers use their work to address/redress historical subjects, and represent their Native communities.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American Indian Studies

ETHN 1025 (3) Introduction to Asian American Studies

Examines the various factors that define minority groups and their positions in American society using Asian Americans as a case study. Emphasizes the perspectives and methodologies of the discipline of ethnic studies.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Asian American Studies

ETHN 1123 (3) Exploring a Non-Western Culture: Hopi and Navajo

Explores two American Indian cultures, Hopi and Navajo and cultural interrelationships from the prehistoric through the contemporary period, using an integrated, holistic and humanistic viewpoint.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 1120

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American Indian Studies

ETHN 2001 (3) Foundations: Race and Ethnicity in the United States

Introduction to race, ethnicity and gender in the United States. Focuses on the five major racialized groups (African Americans, Asian Americans, Chicanas and Chicanos, European Americans and Indigenous peoples) in the U.S. The course design centers on historical and contemporary ideologies and systems that have constructed and continue to define, shape, and impact the significance of race and ethnicity in our economic, political and social lives.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 2004 (3) Themes in American Culture 1

Enables students to explore various themes in pre-1865 American culture. Examines these themes, which vary each year, in their social context.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Studies

ETHN 2013 (3) Critical Issues in Native North America

Explores a series of issues including regulations of population, land and resource holdings, water rights, education, religious freedom, military obligations, the sociopolitical role of men and women, self-governance, and legal standing as these pertain to American Indian life.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: United States Context
Departmental Category: American Indian Studies

ETHN 2014 (3) Themes in American Culture 2

Enables students to explore various themes in post-1865 American culture. Examines these themes, which vary each year, in their social context.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Studies

ETHN 2044 (3) Crime and Society

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, and how the institutions designed to address crime (police, courts, corrections) function.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 2044
Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 2203 (3) American Indians in Film

Examines images of American Indians in films produced by, and about, Native peoples. Follows the creation of "the Hollywood Indian" from still-photography to contemporary motion pictures. Films are analyzed within historical, social, and artistic contexts, and examined in terms of the impact their images have exerted upon American society at large and Native communities in particular.

Additional Information: Departmental Category: American Indian Studies

ETHN 2215 (3) The Japanese American Experience

Surveys the Japanese American experience, emphasizing post-WWII developments. Gives attention to intragroup diversity having to do with generation, ethnicity, ecology, and gender.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asian American Studies

ETHN 2232 (3) Contemporary African American Social Movements

Examines selected case studies of African American collective behavior in a historical context. Emphasizes an in-depth investigation of the continuing African American struggle for social/democratic rights.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Africana Studies

ETHN 2242 (3) African American Social and Political Thought

Introductory course designed to acquaint students with historical and contemporary thinking, writings, and speeches of African Americans.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Africana Studies

ETHN 2304 (3-4) Introduction to Social Justice

Provides undergraduate students with an understanding of how social systems, primarily the educational and health care systems, are key to understanding injustices and criminalization. Topics covered will include trauma and victimization, food and housing justice, educational justice, physical and mental health justice, mass incarceration, #BlackLivesMatter and restorative justice.

Additional Information: Departmental Category: American Studies

ETHN 2432 (3) African American History

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

Equivalent - Duplicate Degree Credit Not Granted: HIST 2437

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: United States Context
Departmental Category: Africana Studies

ETHN 2536 (3) Survey of Chicana/o History and Culture

Through historical and social scientific studies, novels, autobiographies, testimonies, films, music, and art, this course will provide students a survey of Chicana/o history and culture. Historical overviews of Chicana/o peoples from Mesoamerica; the Spanish Conquest; the historical presence of Chicana/o peoples in the Southwest; the rise of the Chicana/o student and community movements; immigration issues; and the gender, sexuality, and criminalization issues.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: United States Context
Departmental Category: Chicana/o Studies

ETHN 2546 (3) Chicana and Chicano Fine Arts and Humanities

Provides foundation for study of Chicano literature, music, the plastic arts, theatre and film. Also introduces aesthetic and critical concepts and their applications in Chicana and Chicano studies.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chicana/o Studies

ETHN 2703 (3) American Indian Religious Traditions

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2700

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Ideals and Values
Departmental Category: American Indian Studies

ETHN 2713 (3) American Indian Literature

Surveys historical and contemporary North American Native American literature. Examines the continuity and incorporation of traditional stories and values in Native Literature, including novels, short stories and poetry.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2717

Additional Information: Departmental Category: American Indian Studies

ETHN 2732 (3) Survey of African American Literature 2

Surveys African American literature from the Depression to the present.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2737

Additional Information: Departmental Category: Africana Studies

ETHN 2746 (3) Chicana/Chicano and Mexican Literature

Introduces Chicana and Chicano and Mexican literary studies, focusing on narrative works by Chicana and Chicano writers. Examines diverse range of Mexican writing in Greater Mexico as it addresses recurring issues and themes, including language, race and class, questions of identity and gender relations.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2747

Additional Information: Departmental Category: Chicana/o Studies

ETHN 2761 (3) Survey of Post-Colonial Literature

Surveys the development of literatures in English in former British colonies. Topics include the spread and adaptation of English language literary forms in Asia, Africa, the Caribbean, and the far new world (Australia and New Zealand). Students learn the causes of the dispersion and the motivations for the clearly different uses of English literary forms in the ex-colonies.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2767

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3015 (3) Asian Pacific American Communities

Covers the concepts, methods, and theories commonly used in community research, as well as substantive information on selected Asian/Pacific American communities. Emphasizes the ethical/political dimensions of community studies.

Recommended: Prerequisite ETHN 1025 or ETHN 2001.

Additional Information: Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Departmental Category: Asian American Studies

ETHN 3024 (3) Introduction to Critical Sports Studies

Learn to think in an informed and critical way about sports in society. Examine the socio-cultural significance of sports as it relates to topics such as youth, social class, race/ethnicity, gender, identity, and intercollegiate athletics. Readings, class discussions, videos, and guest speakers will help expand our understanding of this important social phenomenon.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3026 (3) Women of Color. Chicanas in U.S. Society

Critically explores the Chicana experience and identity. Examines issues arising from the intersection of class, race, and gender. Focuses on controversies surrounding culture and gender through an analysis of feminism and feminismo.

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 3044 (3) Race, Class, Gender, and Crime

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3044 and WGST 3044

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3101 (3) Selected Topics in Ethnic Studies

Intensive examination of a particular topic, theme, issue, or problem in ethnic studies as chosen by the instructor.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3102 (3) Selected Topics in African American Studies

Intensive examination of a particular topic, theme, issue, or problem concerning the African American presence, as chosen by the instructor. Sample offerings could include African American Pop Culture, the Civil Rights Movement, or other African American issues.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 1022 or ETHN 2001.

Additional Information: Departmental Category: Africana Studies

ETHN 3103 (3) Selected Topics in American Indian Studies

Examines a particular topic, theme, issue, or problem in American Indian Studies.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001 or ETHN 2203.

Additional Information: Departmental Category: American Indian Studies

ETHN 3104 (3) Selected Topics in American Studies

Critically examines American identity and experiences, past and present, focusing on ethnicity, gender, popular culture, and political culture.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: American Studies

ETHN 3105 (3) Selected Topics in Asian American Studies

Intensive examination of a topic or issue affecting Asian Americans, such as the Japanese American internment during World War II, or Asian American social movements or community organizations.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 1025 or ETHN 2001.

Additional Information: Departmental Category: Asian American Studies

ETHN 3106 (3-6) Selected Topics in Chicana and Chicano Studies

Intensive examination of a particular topic, theme, issue, or problem in Chicana and Chicano studies as chosen by the instructor.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 3136 (3) Chicana Feminisms and Knowledges

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images, and film portrayals.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3135

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chicana/o Studies

ETHN 3201 (3-4) Multicultural Leadership: Theories, Principles and Practices

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of western and non-western theories and practices. Community service required.

Equivalent - Duplicate Degree Credit Not Granted: INVS 3100

Recommended: Prerequisite ETHN 2001.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Crosscultural/Comparative Studies

ETHN 3212 (3) Introduction to Hip Hop Studies

Examines critical questions posed by hip hop culture. Accentuated in this course are hip hop's contributions to the political-economic, philosophical, and sociological study of race, racism, sexism and sexuality. Examines the ways in which hip hop, as a new social phenomenon, cultural force and aesthetic form, have influenced contemporary American and global culture.

Recommended: Prerequisite ETHN 1022 or ETHN 2001.

Additional Information: Departmental Category: Africana Studies

ETHN 3213 (3) American Indian Women

Explores the experiences, perspectives, and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity, and activism, especially in maintaining Indigenous traditions.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3210

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite ETHN 1023 or ETHN 2001 or WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American Indian Studies

ETHN 3252 (3) African American Urban History

Fosters a better understanding and appreciation of the role African Americans have played in the evolution and shaping of urban America. Employs techniques of urban studies to more effectively assess the many dimensions, subtleties, and insensitivities of life in the city. S. and Afro-American history.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1022 or ETHN 2001 and a working knowledge of U.

Additional Information: Departmental Category: Africana Studies

ETHN 3301 (3) Elements of Religion

Explores universal components of religion, as inferred from religions of the world, ranging from smaller-scale oral to larger-scale literate traditions.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 3300

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3314 (3) Violence Against Women and Girls

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3314 and WGST 3314

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3403 (3) Indigenous Rights and Red Power Movement

Deals with historical events involving conflicts between the U.S. government and American Indians. Examples include the role of the FBI in the Pine Ridge Sioux Reservation (1972-76) or the 1864 massacre of the Cheyenne and Arapaho Indians in Colorado territory. Additional courses may relate to tribal governments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1023 or ETHN 2001.

Additional Information: Departmental Category: American Indian Studies

ETHN 3501 (3) Theory/Methods/Writing in Ethnic Studies

Preparation for empirical inquiry in Ethnic Studies. Emphasizes philosophy of social science and cultural studies. Students engage rigorous, theoretical concepts to understand research methods. Prepares students for writing a lengthy, cogent research paper.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Ethnic Studies (ETHN) majors only.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3575 (3) Japanese American Internment: Critical Thinking in Sociocultural Diversity

Offers a historical overview of the Japanese American experience in the United States. Introduces and explores fundamental issues inherent in the study of human beings from the perspective of cultural social difference.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1025 or ETHN 2001.

Additional Information: Departmental Category: Asian American Studies

ETHN 3671 (3) People of Color and Social Movements

People of color the world over are struggling for sovereignty, independence, civil and human rights, food security, decent wages and working conditions, healthy housing, and freedom from environmental racism and other forms of imperialism. Course analyzes and brings alive these struggles.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 2001.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Crosscultural/Comparative Studies

ETHN 3692 (3) African Am Music: Fr Spirituals and the Blues to Rap/Hip Hop Soul

Offers an overview of the origins and evolution of African American music. Guides students through the musical history, as well as the social, political and cultural history, of the spirituals, blues, ragtime, jazz, gospel, freedom songs, rhythm and blues, rock and roll, soul, funk, disco, techno, house, rap and hip hop soul.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites ETHN 1022 and ETHN 2001 and ETHN 3212.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Africana Studies

ETHN 3701 (3) Gender, Sport and Culture

Critically examines the experiences of girls and women in American sport from a psycho-socio-cultural perspective with a particular emphasis on the constructs of gender, race, class and sexuality and how these constructs both independently and collectively mediate the female sport experience. Explores theories and interpretive frameworks from sport studies, feminist studies, race studies, psychology and cultural studies.

Recommended: Prerequisite ETHN 3024.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3702 (3) African American Sport Experience

Provides a socio-cultural and historical overview of the contributions of African Americans (men and women) to sport in America. Focus is on the macro (patterns of behavior related to large-scale social structures and processes) and micro (behaviors we observe in society, often readily observable in the context of sport and exercise) level of sport analysis.

Recommended: Prerequisite ETHN 3024.

Additional Information: Departmental Category: Africana Studies

ETHN 3704 (3) Athlete as a National Symbol: Nationhood/Nationalism, Sport

Explores the nationalistic terrain of US sport as a way to understand how athletes became a symbol of nationhood and how they are influenced by, and themselves influence, other aspects of US society and culture. Using historical and contemporary examples, this course examines how race, gender, sexuality, economics and the media constructed the nationalistic world of sports today.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 3841 (1-6) Undergraduate Independent Study

Consult the Department of Ethnic Studies for information. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland

Engaging with the ways in which race, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5001 and FILM 4001

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4006 (3) Chicana/Chicano Native American Cultures of the U.S.

Theoretically engaged seminar considers intersections of Chicana/o and Native American studies to shape our scholarly understanding of the U.S. and Mexico borderlands. Ethnographies, historical studies, novels, film, and music will be used to understand the processes of Spanish and Euro-American colonization, neocolonialism, identity formation, gender, syncretism, and mestizaje.

Requisites: Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4084 (3) Punishment, Law and Society

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society. Department enforced prerequisite: SOCY 1001 or SOCY 1004.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4084

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4102 (3) Special Topics in Africana Studies

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5102

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4106 (3) Special Topics in Chicana and Chicano Studies

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4106

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4116 (3) Spoken Word Latino Poetics and Poetry

This is a writing intensive workshop in contemporary poetry writing and Chicana/o and Latina/o poetics-specifically, Nuyorican and Afro-Latino (the Nuyorican Poets Cafe). The purpose of the course is dual-fold: 1) students will be encouraged and empowered to express and develop their poetic voice; 2) students will be challenged to develop and refine their poetic craft. Examines primarily Chicana and Latino specific poetic expression that reflects the cultural mestizaje of Chicano/a and Latina/o peoples.

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Requisite 6 credits in any ETHN class.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4213 (3) Indigenous Futurisms: Speculative Genres and Native Tomorrows

Examines how Indigenous authors, artists and filmmakers have recently begun exploring the genres of Horror, Science Fiction and Fantasy. Considers this shift in light of past and present Native realities. Explores why this shift is happening now, how it helps communities and individuals make political statements, address/redress historical subjects and help to build better futures for us all.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: American Indian Studies

ETHN 4232 (3) The Life and Thought of Martin Luther King Jr

An intensive exploration and examination of the life and thought of the Rev. Dr. Martin Luther King Jr. Special emphasis on the stages of his life and their corresponding productions.

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4272 (3) W.E.B. Du Bois Seminar

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5272

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Departmental Category: Africana Studies

ETHN 4306 (3) The Chicana and Chicano and U.S. Social Systems

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5306

Requisites: Requires a prerequisite course of ETHN 2001 or ETHN 2536 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Chicana/o Studies

ETHN 4353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5353 and RLST 4353 and RLST 5353

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4504 (3) Ethnic-American Autobiography

Investigates the genre of autobiography in America from its inception to the present. American autobiography has been associated with the invention of national character and, thus, is a site of cultural contestation and identity formation. Its changing form crosses disciplinary lines and provides a site for discourses on ethnicity, class, gender, sexuality, age, family, religion and other American cultural conflicts.

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American Studies

ETHN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4552 and ETHN 5552

Requisites: Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Africana Studies

ETHN 4553 (3) Indigenous Representations in the United States

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5553

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite ETHN 1023.

Additional Information: Departmental Category: American Indian Studies

ETHN 4632 (3) Frantz Fanon Seminar

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5632

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Departmental Category: Africana Studies

ETHN 4672 (3) Seminar on the Civil Rights and Black Power Movements

A review of the ideas, events, persons, organizations oriented to the quest for African American social justice in the decade of the sixties.

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4692 (3) Special Topics in Multicultural and Ethnic American Literature

Provides advanced in-depth study of literatures written by ethnic American authors. Texts may be drawn from a range of African-American, Chicano/a, Latino/a, Asian American, Native American or Indigenous literature traditions. Topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4697

Requisites: Requires a prerequisite course of ETHN 1022 or ETHN 2001 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Africana Studies

ETHN 4714 (3) Sport and Social Justice

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5714

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Recommended: Prerequisite ETHN 3024.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4841 (1-6) Independent Study

Work with an approved faculty sponsor to explore a topic in greater depth. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite ETHN 2001.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4951 (3) Senior/Graduate Seminar in Ethnic Studies

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 5951

Requisites: Requires prerequisite courses of ETHN 2001 and ETHN 3501 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 4961 (3) Honors Thesis 1

Supervised original research project in the field of ethnic studies. The goal is to make substantial progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced restriction: application and acceptance into the ETHN Honors Program.

Requisites: Requires a prerequisite course of ETHN 2001 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Arts Sciences Honors Course
Departmental Category: Crosscultural/Comparative Studies

ETHN 4971 (3) Honors Thesis 2

Supervised original research project in the field of ethnic studies. The goal is to complete progress on a written honors thesis that will be orally defended and submitted to the Honors Program of the College of Arts and Sciences. Department enforced prerequisite: application and acceptance into the ETHN Honors Program.

Requisites: Requires prerequisite courses of ETHN 2001 and ETHN 4961 (all minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Ethnic Studies (ETHN) majors only.

Additional Information: Arts Sciences Honors Course
Departmental Category: Crosscultural/Comparative Studies

ETHN 5001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland

Engaging with the ways in which race, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4001 and FILM 4001

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 5102 (3) Special Topics in Africana Studies

Variable topic that allows intensive coverage of a subject, theme, or issue in African American studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4102

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Africana Studies

ETHN 5106 (3) Special Topics in Chicana and Chicano Studies

Examines a particular topic, theme, issue or problem concerning Chicana and Chicano studies.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4106

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 5272 (3) W.E.B. Du Bois Seminar

Analyzes the life and thought of W.E.B. Du Bois for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Du Bois's epistemology and research methodology, as well as his participation in radical political and social movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4272

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Africana Studies

ETHN 5306 (3) The Chicana and Chicano and U.S. Social Systems

Gives special attention to ways U.S. institutions (i.e., legal, economic, educational, governmental and social agencies) affect Chicanas and Chicanos. Discusses internal colonialism, institutional racism, assimilation and acculturation, and identity.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4306

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Chicana/o Studies

ETHN 5353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4353 and RLST 4353 and RLST 5353

Additional Information: Departmental Category: Crosscultural/Comparative Studies

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 5552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4552 and HUMN 4552

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Africana Studies

ETHN 5553 (3) Indigenous Representations in the United States

Examines the relationship and negotiation of culture/status/place through representation(s) within and concerning Indigenous peoples/communities. Focuses on U.S. representational forms in popular experiences e.g., literature, film, media and the roots of those representations via legal and medical definitions. This investigation and analysis is supplemented with focus on gender as well as contextualization through global Indigenous portrayals.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4553

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American Indian Studies

ETHN 5632 (3) Frantz Fanon Seminar

Analyzes the life and thought of Frantz Fanon for its contributions to interdisciplinary and intersectional studies. Emphasis will be placed on the innovative interdisciplinary and intersectional nature of Fanon's psychology, sociology and philosophical anthropology, as well as his participation in African and Caribbean anti-colonial movements.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4632

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Africana Studies

ETHN 5714 (3) Sport and Social Justice

Takes a look at the nuanced and controversial relationship between sport and peace. Although sport is heralded as a powerful tool for social good, drawing attention to causes such as conflict resolution, HIV prevention, environmental initiatives and improved international relationships, it also continues to reflect and reproduce social inequalities in ways commonly overlooked.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4714

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 5951 (3) Senior/Graduate Seminar in Ethnic Studies

Capstone experience in Ethnic Studies. Includes an independent research project and public presentation.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4951

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6000 (3) Foundations of Comparative Ethnic Studies

Examines theories of race, ethnicity, gender, sexuality, colonialism and globalization, especially from the perspectives of communities most impacted by these categories and processes. This is the introductory course for graduate work in Comparative Ethnic Studies.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6001 (3) Research Methods in Comparative Ethnic Studies

Examines various humanistic and social science research methodologies and applies critical frameworks (including feminist, queer, Indigenous and decolonial theories) to research through an intersectional lens committed to analyzing race, class, gender and sexuality as interconnected, knowledge-producing systems of power. Examines how Ethnic Studies scholars can engage with social justice projects by producing knowledge in cutting edge ways.

Requisites: Requires prerequisite course of ETHN 6000 (minimum grade C). Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6002 (1) Professionalization Seminar in Comparative Ethnic Studies

Provides graduate students with professionalization skills, including how to prepare a national fellowship application, how to give a successful job talk, how to publish refereed journals and book volumes and how to approach the academic job market.

Requisites: Restricted to Ethnic Studies (ETHN) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6011 (3) Race and Sexuality Studies

Examines primary texts in queer studies and queer theory while challenging colonial heteronormative and homonormative studies that exclude queers of color and their life experiences. Readings include works by Gloria Anzaldua, Jose Munoz, Audre Lorde, David Eng, Judith Butler, Judith Halberstam, and Michel Foucault. Topics such as queer borderlands, citizenship, racialized and transgender identities will be interrogated.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6014 (3) Gender, Race, Class, and Crime

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 7014

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6100 (3) Race and Citizenship in U.S. History and Culture

Examines how the cultural and legal bounds of U.S. citizenship have been linked to race, gender, labor, class, and sexuality. Analyzes the experiences of racialized and gendered groups to explore the racial formations, exclusions and contradictions inherent with the institution of citizenship.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6101 (1-6) Topics: Specialized Comparative Studies

Focuses on a variety of advanced interdisciplinary studies. Themes include: Race and Sports, Critical Whiteness Studies, Race and Masculinity, Applied Community Engagement, Black Women in the Diaspora, US/Mexico Border Cultures, Criminalization and Latinas/os, Race, Violence and Film, and Cuba and Tourism.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Requisite ETHN coursework.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6103 (3) Indigenous Thought and Theory: Foundations in NAIS

Introduces the theoretical landscapes of Native American and Indigenous Studies. Explores debates, methodologies and concerns that ground the field and provides critical engagement with Indigenous communities and knowledges. Teaches standards for evaluating scholarly sources based on criteria derived from the most outstanding recent scholarship in the field. Requires writing and thinking critically about issues of concern for global indigenous communities.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American Indian Studies

ETHN 6110 (3) Adv. Tpcs. In Chicana/Chicano Studies: US/Mexico Borderlands

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

Equivalent - Duplicate Degree Credit Not Granted: RLST 6110

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Chicana/o Studies

ETHN 6301 (3) Decolonial/Postcolonial Theory

Offers an overview of the origins and evolution of Decolonial/Postcolonial Theory. Critically compares and contrasts decolonial discourse with postcolonial theory. Exposes students to the ways in which decolonial and postcolonial theory conceptually interconnect via Cultural Studies, Critical Race Studies and Ethnic Studies-derived discourses such as racial colonialism, the critique of European imperialism, transnationalism feminism, Indigeneity/Indigenous Studies, Diaspora Studies and Subaltern Studies.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6501 (3) Critical Race Theory: Soc Scnc Explrtn/Intrvntn into Crit Race St

Offers an overview of the origins and evolution of Critical Race Theory (CRT). Critically compares and contrasts legal and extralegal social science approaches to CRT. Exposes students to the ways in which CRT and Critical Ethnic Studies conceptually interconnects via CRT-derived discourses such as Critical Race Feminism, Critical White Studies, TribalCrit, LatCrit, AsianCrit, DesiCriti, QueerCrit and Decolonial/Postcolonial Critical Race Theory.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 6841 (1-6) Advanced Directed Readings in Ethnic Studies

This is a graduate level directed readings course designed to expand student knowledge in a particular area of concentration with a broad interdisciplinary and comparative framework. These areas of concentration include work in Africana, American Indian, Asian American, Chicana and Chicano and Transnational/Hemispheric ethnic studies.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

ETHN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for a minimum of 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Crosscultural/Comparative Studies

Experience Design (TDXD)

Courses

TDXD 5005 (3) Design Technology 1: Visual Technology

Explores the established and cutting edge technologies employed to implement the visual elements of designed environments and experiences. Develops an understanding of the function of these areas, the ways in which they interact in a complete experience and the new directions of experimentation. Elicits research, analysis and development of new concepts in response to design problems as the core modality of this course.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5105 (3) Collaboratory in Experience Design 1

Addresses philosophies of storytelling through experience and the general concepts and aesthetics of Experience Design. The first in a two-part series, this course lays foundational principles focusing on the components of a live experience and how space, narrative and interaction affect the design from early conceptualization through implementation.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Process

TDXD 5500 (3) Experience Design Atelier 1: Design Evolution and Expression

Introduces students to various techniques for graphically representing design ideas using drawing and illustration techniques in order to augment and deepen the diverse skill sets of students in the class. The first in three-part sequence on graphic representation and expressive practices, students will learn how to work out design ideas through sketching, drawing, creating storyboards and collages.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5700 (3) Experience Design Atelier 2: Introduction to Design Graphics

Introduces students to advanced techniques for representing design ideas in graphic form including commonly used software applications (Sketchup, Vectorworks, AutoCAD), scale modeling, mechanical drawing and rendering. The second in a three-part class sequence on graphic representation and expressive practices, this atelier will offer a range of exercises tailored to the skill level of individual students.

Requisites: Requires a prerequisite course of TDXD 5500 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5805 (6) Professional Portfolio 1

Focuses on selecting, organizing and developing a plan for presenting material that will eventually culminate in the completion of a competitive professional portfolio, a vital tool for gaining employment in the Experience Design industry. The first of a two-part credited final project, students begin the process to prepare their professional portfolio under the guidance of faculty and industry professionals.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Dsgn: Documentation

TDXD 6105 (3) Collaboratory in Experience Design 2

Introduces students to professional models of working in the Experience Design industry. The second in a two-part class sequence, students work collaboratively on industry case studies focusing on entertainment, education and cultural destination genres with input from outside professionals in the field.

Requisites: Requires a prerequisite course of TDXD 5105 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Process

TDXD 6210 (3) Storytelling for XD

Explores multi-modal, expressive strategies for experimental storytelling and investigates the diverse languages of live experience. Students complete projects using varying modes of conveyance including physical and spatial action, filmic approaches, digital media and alternative methods. Students will discuss current trends in expressive methods and the nature of story.

Requisites: Restricted to Experience Design (TDXD) MFA students only.

TDXD 6500 (3) Experience Design Atelier 3: Packaging the Design Presentation

Investigates strategies for visually communication and "selling" design ideas in a compelling and well composed visual/aural presentation. The third in a three-part sequence on graphic representation and expressive practices, this class culminates in a final, comprehensive design project portfolio that follows current professional standards.

Requisites: Requires a prerequisite course of TDXD 5700 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 6805 (6) Professional Portfolio 2

Through editing materials collected in TDXD 5805, students will complete adaptable versions (hard copy, digital, web-based and presentations) of their professional portfolios. In this second of a two-part credited project, a committee comprised of faculty and industry professionals guide the completion of XD portfolios.

Requisites: Requires a prerequisite course of TDXD 5805 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Dsgn: Documentation

TDXD 6901 (3) XD Implementation and Engineering

Explores the realities and challenges of implementing themed entertainment design. Within the framework of project based case studies and a real work project, this course analyzes aspects of construction management, client management and approvals, scheduling, budgeting, value engineering, architecture and design.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

TDXD 6910 (6) The Experience Design Center

Offers Experience Design students an opportunity to engage in and complete projects posed by industry professionals or non-profit partners seeking assistance with experiential projects in a professional, practicing lab/studio setting. The XD Center, housed in a campus "maker-space," accepts design challenges and assignments that provide a realistic field experience for students.

Requisites: Restricted to Experience Design (TDXD) MFA students only.

Farrand Residential Acad Prgm (FARR)

Courses

FARR 1000 (1) Farrand Service-Learning Practicum: Special Topics

Offers a varying service-learning practicum experience as corequisite to a service-learning lecture course.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

FARR 1003 (1) Banned Books and the First Amendment

Focuses on a heated topic of discussion since the Constitution was drafted: the censorship of books. Looks at some classics in literature: *Catcher in the Rye*, *The Color Purple* and *Huck Finn*, and will explore the questions of why they were controversial and whether censorship of books is ever justified.

Grading Basis: Pass/Fail

FARR 1100 (1) Passport to Literature in the Humanities

Designed to build on Farrand's strength in the humanities, this course provides first-year students with the tools to think critically and independently and to engage in thoughtful discourse. It offers several short articles selected to provide a sense of community, and also one or two literary works chosen for more in-depth analysis and exploration.

Grading Basis: Letter Grade

FARR 1562 (3) Gandhi's Satyagraha: Love in Action for Humans and Other Creatures

Class texts and films explore social justice and structural violence in regard to humans, animals, and the environment in the light of a Gandhian approach to these issues. Outreach work in the community is included.

Additional Information: Departmental Category: Asia Content

FARR 2000 (3) Farrand Seminar in the Humanities and the Arts

Studies an aspect of the theme of the Center for Humanities Seminar Program each year, and will be taught by faculty participants in the Center's fellowship program.

Repeatable: Repeatable for up to 6.00 total credit hours.

FARR 2002 (3) Literature of Lifewriting

Examines how diverse writers have created unique personal narratives that shape memory within historical and social contexts. Works will exemplify a wide range of literary structures, themes, and strategies that enhance an understanding of the genre and provide models for students' own life writing assignments.

Additional Information: Arts Sci Core Curr: Literature and the Arts

FARR 2510 (3) Exploring Good and Evil through Film

Studies films that depict the best and worst sides of our nature and our capacities both good and evil. It considers how representations of zombies, aliens, cowboys, villains and bad girls reveal what society represses in order to believe in order and goodness. Investigates how the figure of the detective or the hero relies on the criminal or the villain to create his virtue, even as he tries to destroy evil. Topics addressed will be: forms of evil, monstrous women, cowboy heroes, detective evil.

Additional Information: Arts Sci Core Curr: Ideals and Values

FARR 2660 (3) Ethics of Ambition

Through selected readings in classical literature on ethics and through more contemporary readings and films, examines critical ethical issues relating to the competition of ambitions and the alternative styles of choosing between courses of action in a dangerous world. Uses biographies of those whose lives illustrate both the complexities of the struggles and the profundity of possibilities. Considers the unconscious metaphors of national visions and ambitions, the competing ethics of ends and means, the conflicting ambitions in a pluralistic society, and the transcendent ambitions of visionaries.

Equivalent - Duplicate Degree Credit Not Granted: HONR 2250

Additional Information: Arts Sci Core Curr: Ideals and Values

FARR 2820 (3) Future of the Spaceship Earth

Examines major ecological, political, economic, cultural, legal, and ethical issues that will shape the future. Students consider how their decisions influence the future, and reflect on fundamental values and ideals underlying the search for solutions to these complex problems.

Additional Information: Arts Sci Core Curr: Ideals and Values

Farsi (FRSI)

Courses

FRSI 1010 (5) Beginning Farsi 1

Provides a grounding in basic Persian Farsi grammar. The morphological and phonological nuances of the language will be introduced, along with Persian culture. Basic conversation is reinforced on a daily basis with strong emphasis and reiteration upon the homework and covered grammar.

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

FRSI 1011 (3) Introduction to Persian Civilization

An introduction to the history, literature and art of Iranian (Persian) civilization with a focus on the social and cultural aspects of contemporary Iran. Taught in English.

Additional Information: Departmental Category: Farsi Courses in English

Departmental Category: Asia Content

FRSI 1020 (5) Beginning Farsi 2

Continuation of FRSI 1010. Completes the presentation of basic structures of Farsi. Continued acquisition of vocabulary and practice of speaking, listening, reading, and writing. Class conducted largely in Farsi. The second half of the course will introduce authentic texts of Persian prose literature. Some poetry may be included.

Requisites: Requires prerequisite course of FRSI 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

FRSI 1051 (3) Masterpieces of Persian Literature

Offers a broad introduction to Persian literature, one of the richest traditions in world literature. Students will read a selection of poetry by Rumi, Hafiz, Omar Khayyam, as well as a variety of works written by leading Iranian contemporary poets and writers. Through a close reading of literary texts, this course emphasizes their historical and cultural context.

Additional Information: Departmental Category: Farsi Courses in English

FRSI 2110 (4) Intermediate Farsi 1

Provides an intensive introduction to cultural and literary texts of Iran, along with an introduction of the grammatical and rhetorical complexities of Persian prose and poetry. Students continue to develop speaking, listening, and writing skills through activities based on the readings.

Requisites: Requires prerequisite course of FRSI 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Farsi

Departmental Category: Asia Content

FRSI 2120 (4) Intermediate Farsi 2

Continuation of FRSI 2110. Incorporates more readings in Persian literature, both poetry and prose, and cultural readings. Students continue developing speaking, listening and writing skills based on the readings.

Requisites: Requires prerequisite course of FRSI 2110 (minimum grade C).

Additional Information: Departmental Category: Farsi

Departmental Category: Asia Content

FRSI 3110 (3) Advanced Farsi 1

An intensive introduction to both Persian philology and the contemporary novel. Textual analysis of texts ranging from complex to very complex will enable the students to gain a strong grounding in Persian literary texts. Students continue developing speaking, listening, and writing skills through activities based on the readings.

Requisites: Requires prerequisite course of FRSI 2120 (minimum grade C).

Additional Information: Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 3120 (3) Advanced Farsi 2

This course is the continuation of FRSI 3110. The focus will be on the reading and discussion of canonical literary texts as well as on language and media. Students continue developing speaking and listening skills through activities based on the readings and develop the ability to write short papers (3-5 pages) in Farsi.

Requisites: Requires prerequisite course of FRSI 3110 (minimum grade C).

Additional Information: Departmental Category: Farsi
Departmental Category: Asia Content

FRSI 4900 (1-4) Independent Study

Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Farsi
Departmental Category: Asia Content

Film Studies (FILM)

Courses

FILM 1002 (3) Film Analysis for Non-Majors

Introduces the critical study of film, exploring theoretical, historical and technical concerns while presenting a survey of important film periods and genres. Students will hone critical-thinking, close-analysis, and writing skills. Covers a wide variety of films, approaching them from numerous perspectives, considering both the effects films have on individual viewers and their ability to reflect culture.

Additional Information: Departmental Category: Genre and Movements

FILM 1502 (3) Introduction to Film Studies

Introduces basic media literacy by exploring the technical and aesthetic principles behind the production, analysis and interpretation of films. Explores comprehension and thinking about movies critically as technological, cultural and artistic products. Study of films in different social and historical contexts and discussion of the importance of movies as cultural products.

Additional Information: Departmental Category: Genre and Movements

FILM 2000 (3) Moving Image Foundations I

Introduces students to basic image making technology, aesthetics and methods. Fundamentals of film/video production in Super 8mm film, Digital ProRes 422 and other analog and digital image making, editing and management formats. May emphasize personal, experimental or narrative approaches with individual exercises, according to instructor. Basic competencies include composition, lighting, basic audio, basic editing, studio critique, file management, web upload, etc.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Production

FILM 2002 (3) Recent International Cinema

Familiarizes students with current trends and major directors in international cinema. Students attend specific films screened in class and/or offered in the International Film Series, and read and write about these films.

Recommended: Prerequisite FILM 1502 or 6 hours humanities courses involving critical writing.

Additional Information: Departmental Category: Genre and Movements

FILM 2003 (3) Film Topics

Varying topics on important individuals, historical developments, groupings of films, film directors, critical and theoretical issues in film.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Topics

FILM 2004 (3) CU Film Studies Seminar: The Telluride Film Festival

Offers students a unique first-hand understanding of the significance of the film festival circuit in the context of global film culture and scholarship. Students will attend Telluride Film Festival screenings, discussions and Q&A sessions. After the festival, weekly screenings of select films from the previous year's festival offer insight into the festival's influence on box-office and the industry's award season.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intensive and Small Courses

FILM 2005 (3) Form, Structure, and Narrative Analysis

Analyzes the form and structure of narrative, experimental non-narrative, and documentary films. Familiarizes students with the general characteristics of the classic three-act structure, principles of adaptation, form and content of experimental films, structural approaches, and the basic formal, narrative, and rhetorical strategies of documentary filmmaking.

Requisites: Requires prerequisite or corequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Workshops

FILM 2010 (3) Moving Image Computer Foundations

Provides students with artistic foundational hands-on experience in integrated use of media software in both the PC and Mac creative imaging making digital working environments. Includes fundamentals in general computer maintenance, creative and practical audio editing, image management and manipulation, and creative moving image practice.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 2105 (3) Introduction to the Screenplay

Explores, through close reading and original student work, the form and structure of the screenplay from the writer's perspective. Students will begin by analyzing structural and character elements of such screenplays as *Chinatown* and *Witness*, then analyze screenplays of their choosing. Students will learn the basics of screenwriting form, then develop and write 10 minutes of an original screenplay. Non-majors admitted with instructor's consent.

Requisites: Requires prerequisite or corequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Workshops

FILM 2300 (3) Beginning/Intermediate Filmmaking

Covers basic camera, editing, and splicing techniques for Super-8 film. Equipment is available at the film studies office for a modest rental fee.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 2312 (3) Film Trilogies

Study of films designed as trilogies, drawing on a wide range of international cinema. Films include Satyajit Ray's Apu Trilogy (India), Krzysztof Kieslowski's Three Colors Trilogy (Poland), Francois Truffaut's Antoine Doinel cycle (France), and Abbas Kiarostami's Iran Trilogy (Iran). Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Genre and Movements

FILM 2500 (3) Moving Image Foundations II

Instructs students in developing a technical and aesthetic understanding of the principles of analog and digital cinematography. Technical, creative and studio critique emphasis on the Bolex 16mm RX and Black Magic Pocket Cinema cameras, advanced composition, grammar and mechanics of cinema editing, film/digital lighting (exposure, latitude) multi-format origination and file management, non-sync sound techniques, etc.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2000 or FILM 2300 (all minimum grade C). Restricted to FILM (FILM or FMST) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Production

FILM 2513 (3) Major Asian Filmmakers

Surveys the major Asian directors from China, India, Japan, Taiwan, and Vietnam. Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: Topics
Departmental Category: Asia Content

FILM 2521 (3) Classics of the Foreign Film: 1960s to Present

Surveys the classics of international cinema from the 1960s to the present. Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: History

FILM 2610 (3) Animation Production

Includes analysis of independent and experimental animation and an introduction to various animation techniques (object, line, collage, sand or paint on glass, Xerox, cameraless, pixellation, etc.). Students produce exercise films and a final film exploring these techniques.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 2900 (3) Lighting

Covers the basics of "why you need lighting", color temp, as well as camera techniques, lighting theory, and lighting set-ups for still and motion picture film video. Emphasizes hands on as well as theory.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: Production

FILM 3002 (3) Major Film Movements

Historical-aesthetic survey dealing with various styles, movements, genres or national cinemas. Can be taught in conjunction with the appropriate language department. Typical offers are in the French, the German or the Russian films, etc. Also offers detailed approaches to specific styles, subjects or genres: film comedy, melodrama, the Western, women filmmakers, German expressionist cinema, Italian neorealism, etc. Non-majors will need instructor's consent.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Genre and Movements

FILM 3003 (3) Major Film Directors

Focuses on the work of a single director or a group of related directors. Course content varies each semester. Consult the online Schedule Planner for specific topic. Non-majors need instructor consent.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Topics

FILM 3004 (3) Alfred Hitchcock: The American Films

Intensive survey of Hitchcock's American films from 1940 (Rebecca) to 1964 (Marnie). We will concentrate on in-depth analysis of the most influential and significant films made by the most important movie director of the Hollywood era. We will pay special attention to Hitchcock's deep understanding of the intricacies of film language, style and form in relation to the themes and subjects that interested him: guilt, sex, gender relations, crime and punishment, "mothers". Non-majors will need instructor's consent.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3010 (1-3) Film Production Topics

Offers students both theoretical and practical experience in various specialized areas of cinematic production. Topics vary but include production in the documentary, fictional narrative, animation, computer animation, and experimental genres.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3012 (3) Documentary Film

Provides a historical and theoretical introduction to the documentary film. Examines the historical beginnings of documentary film as well as exploring contemporary documentary practice. Canonical moments of documentary history and lesser known examples of documentary film work will be explored.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3013 (3) Women and Film

Examines the representation of women both in mainstream movies and in women's counter-cinema that resists traditional form, content, and spectator-text relationships of Hollywood models. Emphasizes work by key women filmmakers such as Margarethe Von Trotta, Lizzy Borden, and Yvonne Rainer, as well as readings in feminist film theory.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Topics

FILM 3030 (3) Cinema Alternative Process

Explores alternative methods of film processing and filmic image manipulation. Through projects, film screenings, lectures and discussions students will learn fine arts approaches to creative control for the moving image. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2000 or FILM 2300 (all minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite FILM 2500.

Additional Information: Departmental Category: Production

FILM 3032 (3) Stage Tragedy and Film

Presents an aerial survey of the history of Western drama as represented in film: Greek drama, the Elizabethans, Ibsen/Strindberg to O'Neill/Williams, Beckett, etc.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3033 (3) Color and Cinema

Examines color and cinema from historical, technological, aesthetic and theoretical perspectives. Students will be required to complete both creative and scholarly assignments.

Additional Information: Departmental Category: Topics

FILM 3041 (3) Environmental Cinema

Interrogates how fiction and nonfiction filmmakers, writers, cinematographers, and moving-image editors have creatively responded to discoveries made in the field of environmental science. Using books by Rachel Carson and Scott MacDonald as a framework, we will examine a broad spectrum of filmmakers (e.g. Wes Anderson, Todd Haynes, Jennifer Baichwal, Bruce Conner, Percy Smith) alongside the most pressing environmental issues.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Film (FILM or FMST) or Environmental Studies (ENVS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: History

FILM 3042 (3) Horror Film

Serious investigation of the horror film genre as well as its origins in, and relation to, works of romanticist literature (e.g., Poe, Shelley). Issues include: the relation of fantasy and reality; gender in horror film; psychological issues raised by the films; historical issues generated by the genre.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3043 (3) Topics in Critical Film Studies

Prepares students for advanced Film Critical Studies work. Subject matter varies from semester to semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Topics

FILM 3051 (4) Film History 1

Intensive introduction to film history from 1895 to 1945. Topics covered include the beginnings of motion picture photography, the growth of narrative complexity from Lumiere to Griffith, American silent comedy, Soviet theories of montage, German expressionist films, and the transition to sound.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Additional Information: Departmental Category: History

FILM 3061 (4) Film History 2

Starts in 1945 and follows the historical growth and evolution of film aesthetics to the present. Studies Italian neorealist, French new wave, and recent experimental films, as well as the films of major auteur figures such as Bergman, Kurosawa, Fellini, Hitchcock, Bunuel, Antonioni, and Coppola.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 3051 (all minimum grade D-).

Additional Information: Departmental Category: History

FILM 3081 (3) Contemporary American Cinema: 1980 to Present

Examines the relationship between American films from 1980 to the present and their cultural and historical context. Includes films by Bigelow, Fincher, Hardwicke, Lee, Linklater, Lynch, Portillo, Stone and Scorsese. Assumes some film knowledge but is not restricted to majors.

Recommended: Prerequisites FILM 1502 and FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Production

FILM 3104 (3) Film Criticism and Theory

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3104

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) FILM (FILM or FMST) or Humanities (HUMN) majors only.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3211 (3) History of Russian Cinema

Surveys Russian cinema in historical and cultural context from early 20th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 3211

Requisites: Requires prerequisite course of FILM 1502 or RUSS 3211 (minimum grade D-).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Production

FILM 3301 (3) Contemporary Issues in Russian Film

Examines the representation of contemporary Russian society in noteworthy Russian films of the last 20 years. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 3301

Additional Information: Departmental Category: History

FILM 3400 (3) Cinema Production I

Exploration of creative cinema production through short production and post-production projects. A short final project will be required.

Focuses on the tactics and strategies of independent cinema production, examining a variety of approaches to genre. Explores a range of film and digital technologies.

Requisites: Requires prerequisites courses of FILM 1502 (minimum grade C) and FILM 2000 and FILM 2500 (both minimum grade of B-). Requires corequisite courses of FILM 3515 and FILM 3525. Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3402 (3) European Film and Culture

Studies the relationships between European film, art and culture. Offered each summer in a different European city (Rome, Paris, London, Athens, Barcelona). There will be regular in-class lectures, film screenings, field trips and on-site teaching.

Repeatable: Repeatable for up to 12.00 total credit hours.

Recommended: Prerequisite introductory film and art history courses.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Genre and Movements

FILM 3422 (3) The Hollywood Musical

Second only to jazz, some critics regard the Hollywood musical as the greatest American popular art form of the 20th century. Proposes a historical, formal and theoretical approach to the musical through its several iterations, from the classical, to the revisionist, to the unusual, placing the changes in the genre's form, structure, and ideology in the context of America's changing social, political and religious values.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Genre and Movements

FILM 3503 (3) German Film Through World War II

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3503

Additional Information: Departmental Category: Topics

FILM 3504 (3) Topics in German Film

Analyzes key issues in German culture as they are represented in film and other media, e.g., technology, architecture, women and the Holocaust. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3504

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3513 (3) German Film and Society 1945-1989

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3513

Additional Information: Departmental Category: Topics

FILM 3514 (3) German Film & Society After 1989

Introduces post-1989 German culture through film. Emphasizes films in their socio-historical contexts and explores developments in German culture during and after the unification.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3514

Additional Information: Departmental Category: Intensive and Small Courses

FILM 3515 (3) Camera Workshop

Focuses on the development of independent cinema production and post-production skills. The instructor must certify students in order to continue with their BFA studies.

Requisites: Requires prerequisites courses of FILM 1502 (minimum grade C) and FILM 2000 and FILM 2500 (both minimum grade of B-). Requires corequisite courses of FILM 3400 and FILM 3525. Restricted to Film (FILM or FMST) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Workshops

FILM 3525 (3) Cinema Editing Workshop

Focuses on the development of independent cinema post-production skills. The instructor must certify students in order to continue with their BFA studies.

Requisites: Requires prerequisites courses of FILM 1502 (minimum grade C) and FILM 2000 and FILM 2500 (both minimum grade of B-). Requires corequisite courses of FILM 3515 and FILM 3400. Restricted to Film (FILM or FMST) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Workshops

FILM 3563 (3) Producing the Film

Focuses on the production process of movie making from idea through distribution, analyzing each of the five phases involved, including the major players, function and problems inherent in each. Emphasizes the critical role the script plays in this process. Designed to give students a "map of the minefield" before venturing out on their own. Offered through Continuing Education.

Additional Information: Departmental Category: Topics

FILM 3603 (3) Sound and Vision

Historical and aesthetic overview of sound in relation to film, ranging from Hitchcock's *Blackmail* to Mailick's *The Thin Red Line*. Pursues issues in sound design, mixing film scores, voiceovers, and film/sound theory in narrative, experimental, and documentary films. Among the filmmakers to be studied are Vertov, Welles, Altman, Brakhage, Lipsett, Eisenstein, Coppola, Scorsese, Stone, Leone, Godard, Nelson. Also explores a limited practicum using Pro Tools for sound design.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Topics

FILM 3620 (3) Experimental Digital Animation

Explores boundaries of traditional animation construction and delve into contemporary animation history. Small projects will involve experimentation with animation techniques that integrate with analog animation, frame-by-frame digital processes and live-action footage. Ideal for students who have taken FILM 2010 or FILM 2610 or FILM 3525. Students familiar with animation and digital imaging or those eager to explore the process are encouraged to enroll.

Additional Information: Departmental Category: Production

FILM 3660 (3) The Postmodern

Analyzes the cultural and critical practices as well as the thought that defines the postmodern period at the end of 20th century.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3660

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: History

FILM 3700 (3) Digital Audio Design

Studies and applies Pro Tools as a post-production audio toolbox. Applied techniques include sound recording, field recording, foley, vocal recording and editing, plug-in generated sound creation, MIDI, basic scoring principles, audio sweetening and audio mixing. Students will be required to complete regular editing assignments in addition to a final soundscape project.

Requisites: Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3900 (1-3) Independent Study (Production)

Limit of 3 credit hours per semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Production

FILM 3901 (1-3) Independent Study (Critical Study)

Limit of 3 credit hours per semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: History

FILM 3920 (3) Professional Seminar

Learning aspects of professional development in the field of cinema. Through workshops and assignments students will learn of the many opportunities found within all areas of production. Guests will help inform the students of professional options and expectations. Topics will include: crew work, fund raising, marketing festivals, low budget filmmaking, and alternative venues. Students may have an internship concurrently with this course.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 2500 (minimum grade D-).

Recommended: Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 3940 (1-6) Film Studies Internship

Provides students with professional internship experiences with film, video, new media production companies, governmental agencies, production units, audio recording studios and new media industries. Students will be responsible for securing their own internship position.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to Film (FILM or FMST) majors only.

Recommended: Prerequisite CU GPA of at least 2.00 and upper-division standing and a 3.00 GPA as a BA or BFA film studies major.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Production

FILM 3990 (1) Film Practicum

Offers creative and technical experience in aspects of film, video and media production for students in the BFA track and BA production emphasis. Students earn credit by working in any number of "crew" positions for Upper Division Production, MFA productions or faculty projects under the supervision of the course instructor.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Production

FILM 4000 (3) Advanced Digital Postproduction

Through projects, discussions and screenings, explores the advanced practices and aesthetics of computer-based moving-image art editing. Topics include how to edit and manage a postproduction cycle, how to use digital editing systems and capabilities such as compositing, digital audio, and optical effects treatments. Cannot be taken simultaneously with FILM 3400 or FILM 4400.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5000

Requisites: Requires prerequisite courses FILM 1502 and FILM 2000 or FILM 2300 and FILM 2500 and FILM 3400 or FILM 4400 (all minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4001 (3) Screening Race, Class & Gender in the U.S. and the Global Borderland

Engaging with the ways in which racial, class, gender and sexual oppression intersect, this class examines several film productions by and about diasporic and subaltern subjects (especially children and women) in the U.S./Mexico borderlands, and the urban ethnic metropolises of the global borderlands.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4001 and ETHN 5001

Requisites: Requires prerequisite course of ETHN 2001 (minimum grade D-).

Additional Information: Departmental Category: History

FILM 4003 (3) Film and Literature

Explores similarities and differences between literature and film as narrative arts. Studies several novels, short stories and plays and films made from them. Examines problems in point of view, manipulation of time, tone, structure, and setting.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5003

Additional Information: Departmental Category: Topics

FILM 4004 (3) Topics in Film Theory

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topic, establishing critical dialogue with the primary materials.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4004 and ARTF 5004

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) FILM (FILM or FMST) or Humanities (HUMN) majors only.

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 4005 (3) Screenwriting Workshop: Short Form

A writing intensive course that focuses on the art of the short form screenplay. Students will complete regular writing exercises, presentations, and several short scripts.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2005 or FILM 2105 (all minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Workshops

FILM 4010 (1-3) Topics in Film Studies-Production

Prepares students for advanced Film Studies production courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5010

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of FILM 1502 and FILM 2000 or FILM 2300 and FILM 2500 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) FILM (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4013 (3) Film, Photography and Modernism

Provides interdisciplinary study of film, photography and modernism, focusing on issues such as dystopia, alienation, sexuality, subjectivity and self-referentiality. Photographs by Stieglitz, Strand, Weston, Evans, Cartier-Bresson, Kertesz and Moholy-Nagy. Films by Dziga-Vertov, Eisenstein, Resnais, Antonioni, Bergman, Bunuel and Bertolucci.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5013

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Topics

FILM 4021 (3) Directing/Acting for the Camera

Offers an intensive workshop that provides students with experience directing dramatic material, acting before a camera, and interpreting or adopting dramatic material for film. No experience in directing or acting required. Attendance, research and papers required.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5021

Recommended: Prerequisite FILM 1502.

Additional Information: Departmental Category: History

FILM 4023 (3) Topics in International Cinema

Focuses on major international filmmakers who have had a decisive impact on world cinema. Students will learn how directors create their own innovative body of work with specific formal and thematic patterns and will also learn to place such work within multiple frameworks that will cover film history, theory, aesthetics, philosophy and social and cultural analysis.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5023

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-). Restricted to Film (FILM or FMST) or Fine Arts - Creative Arts (ARTC) majors only.

Recommended: Prerequisite FILM 3051.

Additional Information: Departmental Category: Topics

FILM 4024 (3) Advanced Research Seminar

Focuses on a specific topic, director, or genre chosen by the professor. Research skills and critical thinking are emphasized. With faculty guidance, students determine individual projects and present them to the class. Class participation is mandatory. Each student submits a thorough and original research paper for a final grade. Department enforced requisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5024

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites FILM 3051 and FILM 3061.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 4043 (1-3) Topics in Film Studies-Critical Studies

Prepares students for advanced Film Studies critical studies courses. Subject matter varies each semester.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5043

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Topics

FILM 4105 (3) Advanced Screenwriting

Introduces professional screenwriting in the form of a creative writing workshop. Admission by portfolio (see film department). Students write scenes and scripts for short films, feature treatments, etc., and are graded on a final portfolio.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5105

Requisites: Requires prerequisite course of FILM 4005 (minimum grade D-).

Recommended: Prerequisites FILM 3051 and FILM 3061 and an approved writing sample.

Additional Information: Departmental Category: Workshops

FILM 4135 (3) Art and Psychoanalysis

Explores psychoanalytic theory as it relates to our understanding of literature, film and other arts. After becoming familiar with some essential Freudian notions (repression, narcissism, ego/libido, dreamwork, etc.), students apply these ideas to works by several artists (e.g., Flaubert, James, Kafka, Hoffmann and Hitchcock).

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4135

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Topics

FILM 4200 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5200 and MCEN 4151 and MCEN 5151

Additional Information: Departmental Category: Production

FILM 4240 (3) Beginning Video Production

Presents a studio course on basic single camera video production strategies and concepts. Through class screenings, projects, demonstrations, discussions, and readings, students gain an introductory familiarity with camera, lighting, sound, editing and the organization and planning involved in a video project. Explores a basic theoretical understanding of video as an art form and its relationship to television, film, art, history, culture.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4246 and ARTS 5246

Requisites: Requires prerequisite courses of FILM 2000 and FILM 2500 (all minimum grade D-).

Additional Information: Departmental Category: Production

FILM 4340 (3) Intermediate Video Production

Continuation of beginning video production. Extends the knowledge of single camera video production strategies and concepts. Expands the concept of montage (editing) and strategies to develop a video project through class screenings, projects, discussions and readings. Furthers theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4346 and ARTS 5346

Requisites: Requires prerequisite course of FILM 4240 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 4400 (3) Digital Post-Production Process

Through projects, discussions, and screenings, this class explores the practices and aesthetics of computer-based moving-image art editing. Formerly FILM 3600.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5400

Requisites: Requires prerequisite course of FILM 3525 (minimum grade D-). Restricted to Film (FILM or FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4440 (3) Advanced Video Production

Continuation of intermediate video production. Explores advanced technical skills to control the quality of the video image in production, postproduction, and distribution. Emphasizes self-motivated independent projects, conceptual realization of advanced student work and basic working knowledge of distribution and life as a media artist. Promotes further theoretical understanding of video as an art form.

Equivalent - Duplicate Degree Credit Not Granted: ARTS 4446 and ARTS 5446

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of FILM 4340 (minimum grade D-).

Additional Information: Departmental Category: Production

FILM 4453 (3) Elective Affinities: Avant-Garde Film and the Arts

Traces the history and aesthetics of avant-garde/experimental films in light of similar ideas found in the other arts, particularly painting, poetry, photography and music. Topics covered include Dada and the early avant-garde; surrealism and psychodramas; Brakhage and abstract expressionism; feminist arts and film since the 1980s; the idea of the sublime in painting, music, and film; landscape in painting, photography and film; post-modernism and the cinema; queer theory, gender/identity politics and aesthetics of recent films; and specific multiple disciplinary artists such as Andy Warhol, Michael Snow, Helen Levitt and Gunvor Nelson.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5453

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

Additional Information: Departmental Category: Topics

FILM 4500 (3) Cinema Production 2

Advanced exploration of creative cinema production through short production and post-production projects. Course focuses on the tactics and strategies of independent cinema production leading to the completion of a BFA thesis project exploring either documentary, experimental, or narrative genres.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5500

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FILM 3400 and FILM 3515 and FILM 3525 (all minimum grade C). Restricted to Film (FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4505 (3) Screenwriting Workshop: Long Form

Creative writing workshop in which students plan and write a feature-length screenplay with emphasis on format, dialogue, characterization, and story.

Requisites: Requires prerequisite course of FILM 1502 and FILM 2000 (all minimum grade D-).

Additional Information: Departmental Category: Workshops

FILM 4600 (3) Creative Digital Cinematography

Explores creative approaches to single camera digital cinematography through short projects, discussions and screenings. Relates creative photography and poetic approaches to the digital camera cinema.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5600

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 2000 or FILM 2300 and FILM 2500 and FILM 4400 or ARTS 4246 or ARTS 5346 (all minimum grade D-). Restricted to Film (FMST) majors only.

Additional Information: Departmental Category: Production

FILM 4604 (3) Colloquium in Film Aesthetics

Seminar for the serious round table discussion and critique of film as an art form, emphasizing development of appropriate verbal and written language skills for description of film. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors) with a minimum GPA of 3.0 or instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: ARTF 5604

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Intensive and Small Courses

FILM 4959 (3-6) Honors Senior Thesis

For exceptional Film Studies majors who wish to write an honors thesis based on independent research or creative work under the direction of a faculty member.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sciences Honors Course
Departmental Category: Intensive and Small Courses

Finance (FNCE) Courses

FNCE 2010 (3) Fundamentals of Financial Analysis

Prepares students for financial analysis. Covers mathematical and statistical topics required for such analysis, including derivatives, optimization, integration, probability, inference and regression. Students will become proficient in using the tools and applying the to various financial contexts.

Requisites: Requires prerequisite course of BCOR 2002 (minimum grade D-). Restricted to Business (BUSN) majors with 26-180 units completed.

FNCE 2820 (3) Introduction to Personal Financial Planning

Introduces the concepts, tools, and applications of personal financial planning. Provides the students with tools and techniques for managing their personal finances. With these skills, students gain the ability to effectively deal with their ever-changing financial environment.

Requisites: Restricted Personal Financial Planning (PFP) students with 26-150 credits.

FNCE 3010 (3) Corporate Finance

Covers the theory and practices governing the management of capital in a business firm. Examines the determinants of capital requirements, methods of obtaining capital, problems of internal financial management and methods of financial analysis.

Requisites: Requires a prerequisite course of FNCE 2010 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 3030 (3) Investment and Portfolio Management

Develops modern portfolio theory and applies it to pricing both individual assets and portfolios of assets. Topics include Markowitz portfolio selection model, capital asset pricing model, arbitrage pricing theory, bonds, portfolio performance measurement, and issues of market efficiency. Formerly FNCE 4030.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

FNCE 3040 (3) Insurance, Risk Management and Retirement Planning

Part one of the course focuses on risk management and insurance concepts for personal financial planning. Topics include insurance for life, health, disability, property and liability risks, as well as annuities, group insurance and long term care. Part two of the course focuses on retirement planning and employee benefits in personal financial planning. Provides an understanding of the concepts of social security and Medicare benefits, retirement plan types, group insurance benefits and distribution options.

Requisites: Requires a prerequisite course of FNCE 2010 (minimum grade D-). Restricted to Business (BUSN) majors with the PFP subplan and with 52-180 units completed.

FNCE 3060 (3) Estate Planning

Basic estate planning principles and skills are presented that are necessary for the financial planner to successfully counsel clients and provide relevant advice as part of a comprehensive financial plan. Topics include wealth distribution strategies, transfer document, tax code, unified transfer tax system and the determination of an individual's estate tax liability.

Requisites: Requires a prerequisite course of FNCE 2010 (minimum grade D-). Restricted to Business (BUSN) majors with the PFP subplan and with 52-180 units completed.

FNCE 4000 (3) Financial Institutions Management

Analyzes the structure, markets, and regulations of financial institutions. Studies problems and policies of internal management of funds, loan practices and procedures, investment behavior, deposit and capital adequacy, liquidity, and solvency.

Requisites: Requires a prerequisite course of FNCE 3010 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4040 (3) Derivative Securities

Develops the modern theory of contingent claims in a mathematical framework oriented toward applications. Examines how to use derivatives for risk management and to tailor portfolio payoffs. Provides an in-depth analysis of the properties of options.

Requisites: Requires a prerequisite course of FNCE 3010 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4050 (3) Capital Investment Analysis

Focuses on capital budgeting and investment issues. Emphasizes issues relating to cash flows, capital rationing, the investment versus financing decision, leasing, fluctuating rates of output, investment timing, capital budgeting under uncertainty and investment decisions with additional information.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (all minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4060 (1-6) Special Topics in Finance

Presents new subject matter in finance. The summer offering is the London Seminar in International Finance and Business. Department enforced prereq.: varies, see advising office.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of FNCE 3010 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4070 (3) Financial Markets and Institutions

Examines the economics of financial markets and the management of financial institutions, both domestic and international. Topics include an overview of U.S. and international financial markets, pricing and risk factors, interest rates, markets for securities and financial services and markets for derivative financial instruments. For students planning to take FNCE 4000 and FNCE 4070, it is recommended that FNCE 4070 precede rather than follow FNCE 4000.

FNCE 4340 (3) Security Analysis

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4820 (3) Topics in Finance

Offered irregularly to provide opportunity for investigation into new frontiers in finance.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Finance.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4826 (3) Experimental Seminar: Corporate Governance

What is the objective of corporate managers? Do they only think about their own benefit? Are they concerned about their shareholders? Are corporate managers concerned about their other stakeholders like employees, customers, and people that live in towns and cities they operate in? Corporate governance addresses the above questions. The objective of the course is to provide the student with a state-of-the-art understanding of corporate governance as it relates to: Corporate board structure, Executive and board compensation, Entrepreneurship and private equity, Corporate social responsibility.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4830 (3) Seminar in Investment Banking

Introduces the student to a career in investment banking and provides specific modeling skills necessary and important during the first phase of such a career.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4831 (3) Seminar in Investment Management

The purpose of this course is for students to understand the investment management profession. The course is designed to be a blend of theory and practice. Extends the basic principles of security analysis, asset pricing theory, portfolio construction, and portfolio performance evaluation. Students will apply these principles in determining, over the semester, how to manage the CU investment fund.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (minimum grade D-). Restricted to Business majors with 52-180 units completed.

FNCE 4832 (3) Microfinance

In the last two decades, microfinance initiatives have provided the primary worldwide impetus to promote economic independence for the poor (1.4 billion). Microfinance links the financial markets with entrepreneurship to create a platform that facilitates financial inclusion to the poor. In a semester long project, students build a hypothetical financial institution that provides access to credit, saving, insurance and other services to a segmented poor population.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4010

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 90-180 units completed.

FNCE 4835 (3) Fixed Income Securities

Provides a working knowledge of fixed income securities, primary and secondary fixed income and interest rate markets, bond credit analysis, credit default swaps and bond portfolio management strategies. The institutional details of government, corporate and municipal fixed income securities and markets will be covered. Also covered will be corporate credit analysis and credit default swaps and, finally, bond portfolio management strategies.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

FNCE 4840 (3) Personal Financial Plan Development Capstone

Reviews, integrates and applies personal financial planning concepts and skills. It builds on the previous PFP courses taken in the program. Students will prepare written financial plans based on comprehensive and integrative cases. The case method is a primary instructional tool. Individual and team written reports, as well as class presentations of cases, are required.

Requisites: Requires prerequisite courses of ACCT 3440 and FNCE 2820 and FNCE 3030 and FNCE 3040 and FNCE 3060 (all minimum grade D-). Restricted to Business (BUSN) majors with 102-180 units completed.

FNCE 4850 (3) Business Senior Seminar in Finance

Develops analytical and decision making skills necessary to address real-world business finance situations. Topics include financial analysis and forecasting, capital budgeting, valuation, capital structure policy, international finance, and financial ethics. Uses a combination of lecture and cases; team and individual work.

Requisites: Requires prerequisite courses of FNCE 3010 and FNCE 3030 and ACCT 3220 (all minimum grade D-). Restricted to senior Finance (FNCE) majors with 102 to 180 units completed.

FNCE 4900 (1-6) Independent Study

Intended only for exceptionally well qualified business seniors. Prior consent of dean and instructor under whose direction study is taken is required and departmental form.

FNCE 6820 (1-3) Graduate Seminar

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in finance.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

FNCE 6900 (1-6) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

Repeatable: Repeatable for up to 6.00 total credit hours.

FNCE 6940 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 3.00 total credit hours.

Grading Basis: Pass/Fail

FNCE 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

FNCE 7100 (3) Doctoral Seminar: Finance Theory

Develops the foundations for the study of modern financial economics by analyzing individuals' consumption and portfolio decisions in the context of risk and then traces the implications to market valuation of traded securities. Topics include the meaning and measurement of risk, portfolio theory, the Capital Asset Pricing Model, and arbitrage pricing arguments like those employed in Modigliani and Miller's capital structure theory and the Black-Scholes option pricing model.

Requisites: Restricted to Business Administration (BUAD) graduate students only.

FNCE 7200 (3) Doctoral Seminar: Empirical Research Methods in Finance

Develops an understanding of current empirical methods used to examine research issues related to corporate finance and the capital markets.

FNCE 7330 (3) Doctoral Seminar: Corporate Finance, Theoretical, and Empirical Issues

Develops and examines theories and issues in corporate finance. Topics may include corporate control, capital structure, financial signaling, and payout policy.

FNCE 7550 (3) Doctoral Seminar: Special Topics in Finance

Closely examines areas of specific interest to academic research in finance. Subjects vary and may include game theory, stochastic processes in finance, continuous-time modeling, derivative security pricing, the microstructure of securities markets and financial institutions, innovation, and engineering.

FNCE 7800 (3) Doctoral Proseminar: Finance

Provides finance doctoral students with an orientation to the finance field; introduces contemporary research perspectives and priorities. Students discuss papers that illustrate academic researchers' use of various disciplinary theoretical and empirical tools to address finance problems.

FNCE 7830 (1) Doctoral Seminar: Dissertation Research

Assists doctoral students in integrating courses and fields of study in order to apply their knowledge and skills to problems in finance. Gives special attention to development of thesis topics. Continuous enrollment required of all finance doctoral students while doing course work.

FNCE 8820 (3) Graduate Seminar

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in finance.

FNCE 8900 (1-3) Independent Study

Instructor consent required and departmental form required.

Repeatable: Repeatable for up to 3.00 total credit hours.

FNCE 8990 (1-10) Doctoral Thesis

Finnish (FINN)

Courses

FINN 1010 (4) Beginning Finnish 1 - DILS

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class.

Additional Information: Departmental Category: Finnish Courses

FINN 1020 (4) Beginning Finnish 2- DILS

Continuation of Beginning Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1010 (minimum grade C-).

Additional Information: Departmental Category: Finnish Courses

FINN 2010 (4) Intermediate Finnish 1 - DILS

Continuation of Beginning Finnish 2. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 1020 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Finnish Courses

FINN 2020 (4) Intermediate Finnish 2 - DILS

Continuation of Intermediate Finnish I. Provides practical, communicative language skills for use in a variety of situations. Examines intermediate language structure and grammatical forms. Introduces students to Finnish history and contemporary culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: FINN 2010 (minimum grade C-).

Additional Information: Departmental Category: Finnish Courses

First Year Seminar (FYSM)

Courses

FYSM 1000 (3) First Year Seminar

Provide first year students with an immersive experience in an interdisciplinary topic that addresses current issues including social, technical and global topics. Taught by faculty from across campus, the course provides students with an opportunity to interact in small classes, have project based learning experiences and gain valuable communication skills. Seminar style classes focused on discussion and projects.

Requisites: Restricted to students with 0-26 credits (Freshmen) only.

French (FREN)

Courses

FREN 1010 (5) Beginning French 1

For students with no previous knowledge of French. Presents basic grammar and most commonly used French vocabulary. Introduces students to Francophone culture.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: French

FREN 1020 (5) Beginning French 2

Continuation of FREN 1010. Completes the presentation of most basic structures and French vocabulary.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1050

Requisites: Requires a prerequisite course of FREN 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: French

FREN 1050 (5) Beginning French Review

Covers the material of FREN 1010 and 1020 in one accelerated semester. Intended for students who know some French (i.e., four to five semesters in high school) but do not have skills adequate for 2000-level courses. Department enforced prerequisite: 2 years of high school French.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1010 or FREN 1020

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: French

FREN 1200 (3) Medieval Epic Through Game of Thrones

Covers the most important works of medieval literature, in English translation. Among the texts studied are the Nibelungenlied, the Song of Roland, and Arthurian romances, including the stories of Lancelot and Guinevere and Tristan and Isolde. Offers a general introduction for nonmajors to medieval literature and society. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1400 (3) Medieval/Renaissance Women Writers in Italy and France

Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1400

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 1500 (3) Literature and Politics in the Age of Enlightenment

Introduces political dimensions of 18th century French literature. Surveys political and social preoccupations that manifest themselves across genres (novels, scientific treatises, dialogues, erotic literature, etc.). Examines contributions made by 18th century French writers to the sociological and political imagination of Western tradition. Taught in English.

Additional Information: Departmental Category: French

FREN 1610 (3) How to Be French, 1: The Ancien Regime

Explores medieval and early modern French culture in the widest sense, encompassing masterpieces of French literature, architecture, and visual art as a key to the habits, customs, and practices of everyday life. Major themes are "living and dying," "heroes, villains, and kings," "courtliness, civility, and the art of love," and "crafty little guys."

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1620 (3) How To Be French? 2: Modernity

Introduces students to French culture in its widest sense and in particular to reflect on major social and cultural contradictions inherited from the French Revolution, which still define "Frenchness" today. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1700 (3) Francophone Literature in Translation

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and Canada. Gives special attention to oral tradition, identity, question, and cultural conflict. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Departmental Category: French

FREN 1750 (3) French Colonialism: North Africa and the Middle East

Offers a general introduction to French and Francophone literature and visual arts (painting, photography, film) from the nineteenth century to the present depicting cultures and societies of the Middle East and North Africa. In English with English translations of French texts.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 1800 (3) Contemporary French Literature in Translation

Reviews the major philosophical, political, and aesthetic issues in the 20th century French novel and drama. Beginning with existentialist literature, discussion focuses subsequently on the Theatre of the Absurd, the new novel, World War II and the Holocaust, and recent women writers. Taught in English.

Additional Information: Departmental Category: French

FREN 1850 (3) Introduction to French Society and Culture through Cinema

Introduces students to French society and culture through French cinema through films that focus thematically on major historical events (e.g., World War II; student revolts of 1968) and cultural constants of French society (e.g., feminism; colonialism and its aftermath). Taught in English.

Additional Information: Departmental Category: French

FREN 1880 (3) The Zombie in History and Popular Culture

Discusses the emergence of the zombie figure in the Caribbean and its evolution from colonial Haiti to present-day popular culture having passed through Hollywood. Through movies and literary, historical, and scientific documents, students will study critically how this mass-media icon came to represent deep-rooted anxieties about the modern world.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1900 (3) Modern Paris in Literature, Photographs, Paintings and Movies

Introduces the rise of modern Paris from the French Revolution (1789) to today. Studies the physical and sociological changes of the city in terms of architecture and industrialization through French literature, movies, paintings and photographs. Addresses problems due to the magnitude of the city, the growing fear of urban vices, and the dilemma of controlling massive urban populations. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 1950 (3) French Feminisms

Introduces students to the central problematics that have defined French feminist studies. This course focuses on the various literary and historical contexts in which core concepts such as female subjectivity and agency, feminist writing and political engagement have arisen and developed in Early Modern and Modern France by looking at multiple media (literary text, film, painting). Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 2110 (3) Second-Year French Grammar Review and Reading 1

A film based curriculum will expand the knowledge of francophone culture and will continue the development of communication skills begun in the first year. This third semester course will review essential beginning grammar before introducing intermediate structures, vocabulary, and cultural/literary readings. Satisfies arts and sciences foreign language requirement.

Requisites: Requires a prerequisite course of FREN 1020 or FREN 1050 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: French

FREN 2120 (3) Second-Year French Grammar Review and Reading 2

Completes the film-based study of intermediate grammar begun in FREN 2110. Continued reading in French literature and culture, with considerable practice in writing and speaking French. Fulfills the Graduate School language requirement for the Ph.D.

Requisites: Requires a prerequisite course of FREN 2110 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 2500 (3) Conversation in French

Puts into practice all that has been learned in the first four semesters of college French. Builds conversational skills and confidence through acquisition of new vocabulary and a review of grammar essential to discussing different aspects of French culture. All work is in French.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3010 (3) French Phonetics and Pronunciation

Improves students' ability to pronounce French correctly. Coursework involves the International Phonetic Alphabet, understanding the differences between pairs of sounds, and recognizing the relationship between spelling and pronunciation. Required of all FREN majors.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3020 (3) French Phonetics Through Musical Performance

Advanced oral practice and interpretation of a French Musical. This course of applied and corrective phonetics concentrates on developing good pronunciation and fluency through song. The course culminates with a public presentation of the musical studied in class.

Requisites: Requires a prerequisite course of FREN 3010 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3050 (3) French Composition 1

French third-year level composition course. Students practice and write different forms of formal French writing. They also hone their grammar skills and analytical reading of short literature pieces. This course or FREN 3060 is required for all French majors.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3060 (3) French Composition 2

French third year level composition course. Students build on their previous knowledge of formal writing in French and more emphasis is given to argumentative and analytical style of writing. This course or FREN 3050 is required for all French majors.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3100 (3) Introduction to Critical Reading and Writing in French Literature

Study of French literature through close readings of representative examples of major literary forms (poetry, fiction, drama, essay) and through the composition of critical writings in French. Required for French majors.

Requisites: Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3110 (3) Main Currents of French Literature 1

Surveys 19th and 20th century French literature. Close reading of selected texts and the principal writers and schools. This course or FREN 3120 are required for all majors.

Requisites: Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3120 (3) Main Currents of French Literature 2

Surveys 19th and 20th century French literature. Close reading of selected texts of the principal writers and schools. This course or FREN 3110 are required for all majors.

Requisites: Requires a prerequisite or corequisite course of FREN 3100 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 3200 (3) Introduction to Literary Theory and Advanced Critical Analysis

Introduces important aspects of both classical and modern literary theory as an aid to reading and understanding literary texts. Covers theoretical works by figures ranging from Plato and Aristotle to modern French critics such as Barthes, Foucault, and Derrida in conjunction with selected literary works. Offers students more sophisticated means of understanding issues like gender, ethnicity, the roles of both author and reader in constructing meaning, the nature and functions of signs, and the relationship between literature and the larger society. Conducted in English, though French majors are required to read the texts in the original language. Required for students taking honors in French or Italian.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 3500 (3) French Current Events: Conversation and Composition

For students who have spent fewer than four months in a French-speaking environment. Focuses on presentations, debates, discussions, readings and written work.

Requisites: Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3600 (3) Business French 1

Gives students the tools needed to function in a French-speaking work environment. A culminating project involves creating a business in a francophone country.

Requisites: Requires a prerequisite course of FREN 2120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3700 (3) French-American Cultural Differences

Through readings, films, discussion and activities, students learn the defining values of their own country, those of France, and key differences between the two cultures. Taught in French.

Requisites: Requires a prerequisite or corequisite course of FREN 3050 or a prerequisite or corequisite course of FREN 3060 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 3800 (3) France and the Muslim World

Introduces students to the polemic colonial, social, and cultural interactions of France and Islam. Close attention will be paid to paradigms of identities of one of the major European nations and the Islamic world. Readings and discussion topics for this course cover the social, cultural, and literary depictions of Islamic and French interactions, negotiations, and contradictions. Taught in English. Cannot be used for French major or minor credit.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: French

FREN 4030 (3) Advanced Oral Practice and Interpreting

Concentrates on developing (or preserving) speaking fluency, correct pronunciation, and a good working vocabulary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4110 (3) French Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4120.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of FREN 3110 or FREN 3120 (minimum grade C-).

Additional Information: Departmental Category: French

FREN 4120 (3) French Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics. See also FREN 4110.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: French

FREN 4170 (3) Francophone Literature

Studies the literary expression of French-speaking peoples of Africa, the Caribbean, and French Canada. Gives special attention to oral tradition, identity question, and cultural conflict.

Requisites: Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 4250 (3) Medieval and Renaissance Readings

Explores the complex and evolving cultural and historical contexts of medieval and Renaissance French. Introduces the masterpieces of French medieval and Renaissance literature, including the Chanson de Roland and Arthurian romance. Also focuses on the work of Marie de France, Guillaume de Lorris and Jean de Meun, Christine de Pisan, Machaut, Villon, Louise Labe, and the poets of the Pleiade, Rabelais, and Montaigne.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4300 (3) Theatre and Modernity in 17th Century France

Readings of plays by Corneille, Moliere and Racine introduce students to theatre's role as a mirror of the multifarious tensions shaping modern Western experience. Taught in English with English translations.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: French

FREN 4330 (3) Moliere and 17th Century French Comedy

Close readings of farces and comedies of Moliere in context with selected comedies by Corneille, Rotrou and Cyrano de Bergerac and selected satires by Boileau and La Fontaine. Themes include comedy as a form of social criticism and the sociocultural significance of such episodes of Moliere's career as the scandalous quarrels of *L'ecole des Femmes* and *Tartuffe*.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4350 (3) French Enlightenment

Studies fiction, essays, theatre, and philosophical tales. Emphasizes the Enlightenment in France through the texts of its major representatives: Montesquieu, Voltaire, Marivaux, Diderot, and Rousseau.

Requisites: Requires prerequisite courses of FREN 3100 and FREN 3110 and FREN 3120 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4430 (3) Survey of 19th Century French Literature

Examines fiction, poetry and theatre in 19th century France. Focuses on developing and changing literary styles and subject matter throughout the century in historical, philosophical and social context.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3120 (all minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: French

FREN 4470 (3) 20th Century French Theatre and Poetry

Close readings of plays from the turn of the century to the contemporary period introduce the principal themes and techniques of modernist and postmodernist French theatre. Students are encouraged to consider problems commonly evoked by these texts and to compare the positions that each text takes on such problems as the status and uses of language, the function and limits of the theatre and the dialectic of appearance and reality.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4480 (3) 20th Century French Novel

Close readings of novels from the 1930s to the contemporary period introduce the principal themes and techniques of the modernist and postmodernist French novel. Students are encouraged to analyze a variety of questions commonly evoked in these texts, such as the problem of representation, the uses and abuses of writing, the relation of fiction and history and the status of the subject in the world.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4600 (3) Topics in French Film

Covers various topics in the French and some other Francophone cinemas (Belgian, Swiss, Quebecois) from 1895 to the present. Focuses on periods, schools, themes, and directors from Melies to Duras, and the critical approaches by which they are studied. Varies from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of FREN 3050 or FREN 3060 and FREN 3100 (all minimum grade C-).

Additional Information: Departmental Category: French

FREN 4700 (3) Encountering Animals: contemporary Discourse and the Dialog of Species

Explores Western philosophy and literature recent challenges to species' differences and human privileges and includes contemporary theory, novels as well as movies and other cultural artifacts. Themes include animal representations in today's culture, animal and human bond, animal welfare, post-humanism. Taught in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: French

FREN 4750 (3) Methods of Teaching French and Professional Orientation

Presents current methodology and techniques for teaching foreign language for proficiency. Areas of study include ACTFL guidelines, National Standards, assessment, classroom activities, curriculum, and syllabus design.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: French

FREN 4800 (3) Postmodernist French Novel in Translation

Focuses upon recent innovations in the French novel, and upon the postmodernist literary aesthetic. Students will examine a variety of avant-garde novels, and analyze the kinds of literary experimentation that those novels propose. They will be asked to consider a series of questions concerning the changing nature of literary representation and the status of the novel as a cultural form. Taught in English. Cannot be used for major or minor credit.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: French

FREN 4840 (1-6) Independent Study: Language

Upon consultation only and at the undergraduate level.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: French

FREN 4860 (3) War, Trauma, and Memory: Amnesias, Revisions, and Representations of Traumatic History

Attempts to investigate how extreme historical events (war, genocides, terror attacks) function as "trauma" and how these extreme events are dealt with by personal and collective memory in historical narratives, literary and cinematic fiction, and memorials. Amnesia and other types of historical negations or revisions will be analyzed, along with representations of trauma and the difficulties raised by this memorializing. Taught in English. Cannot be used for major or minor credit.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: French

FREN 4960 (6) High School French Teaching

Offered as part of the supervised student teaching in a secondary school required for state licensure to teach French. These hours do not count toward student hours in the major nor in the maximum departmental hours allowed. Pass/fail only.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: French

FREN 4980 (3) French Senior Honors Thesis

The senior honor thesis is a 40 to 45 page original research paper, written in French, and constitutes a requirement for graduating with departmental honors.

Requisites: Requires a prerequisite course of FREN 3200 (minimum grade D-).

Additional Information: Arts Sciences Honors Course
Departmental Category: French

FREN 4990 (3) Senior Seminar

Preparation of a 15-page research paper in French presented to two members of the department faculty and defended orally in class.

Recommended: Prerequisite at least one course numbered FREN 4100 or above and all third-year requirements and advisor consent.

Additional Information: Departmental Category: French

FREN 5110 (3) French Special Topics

Different topics are offered and, in a number of cases, cross-listed with other departments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5120 (3) French Special Topics

Different topics are offered and, in a number of cases, cross-listed with other departments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5170 (3) Francophone African Literature

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5250 (3) Medieval and Renaissance Readings

Through close readings of masterpieces of French medieval and Renaissance literature in conjunction with contemporary criticism and theory, explores the contexts of medieval and Renaissance France.

Readings in French. May be taught in English to accommodate students in other programs.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5310 (3) 17th Century French Tragedy and Poetry

Close readings of tragedies by (among others) Corneille and Racine, placed in the context of baroque and neoclassical political and artistic culture as illustrated by philosophy, painting, and science. Drawing on recent criticism and theory, explores heroic drama's role as a symptom and agent of early modern French social and intellectual history.

Readings in French, but may be taught in English.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5320 (3) 17th Century French Prose

Close readings of major works by, e.g., Descartes, Pascal, La Fayette, La Rochefoucauld, and La Bruyere. Themes include 17th century theories of self, early modern epistemology, notions of honnêteté and the critical analysis of human motives and behavior, the emerging novel, and the critique of heroic idealism and of the monarchic absolutism of the Sun King, Louis XIV. Readings in French, but may be taught in English.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5330 (3) Moliere and 17th Century French Comedy

Close readings of the comedies in context with the works of, e.g., Corneille, Rotrou, Cyrano, Boileau, and La Fontaine. Themes include Moliere and the institution of literary authorship, comedy's role as social critique, the deconstruction of the early modern subject, and the cultural politics of the scandals surrounding *L'ecole des femmes* and *Tartuffe*.

Readings in French, but may be taught in English.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5350 (3) French Enlightenment

Focuses on the uses of literature to address the revolutionary philosophical, scientific, religious, and/or sociopolitical questions of the day. Explores Diderot and d'Alembert's *Encyclopedie*, Voltaire and Diderot's philosophical tales and dialogues, Rousseau's *Discours*, and other writings. Discusses the development of specific literary forms to promote the ideas and goals of the philosophers to reach a changing and diverse readership and to fight censorship.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5360 (3) 18th Century French Literature

Focuses on the study of a specific literary genre (e.g., theatre, the novel) or on the global production of a major author (e.g., Voltaire, Diderot, Rousseau). Discussion stresses both the uniqueness of the genre/writer and their significance as representatives of the century's changing society and culture.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5420 (3) 19th Century French Literature

A survey of principal works and movements, intended as an introductory course.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5430 (3) Topics in 19th Century French Prose, Poetry, and Theatre

Topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5440 (3) Literary Ludics

Taught in French and English. Focuses on literary structures proposed by author to reader as games. Considers critical texts, both practical and theoretical, with a view toward defining the relation between criticism and its objects.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5470 (3) 20th Century French Theatre and Poetry

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 5770 (2-3) Methods of Teaching French as a Foreign Language

Familiarizes students with current methodology and techniques in foreign language teaching.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 6840 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

FREN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: French

General Engineering (GEEN)

Courses

GEEN 1010 (4) Engineering Explorations Through Physics

Explore the world of engineering through understanding physics concepts, engaging in active learning assignments, and conducting hands-on labs and experiments. Students will analyze product designs and engineering decisions based on the physics surrounding the situation. Formerly COEN 1010.

Requisites: Restricted to College of Engineering majors with 75 or less cumulative hours.

Grading Basis: Letter Grade

GEEN 1400 (3) Engineering Projects

First-year students solve real engineering design problems in interdisciplinary teams. Design projects vary by section. Curriculum focuses on iterative design process, teamwork and team dynamics, supporting design with testing and analysis, and technical writing. Completed projects are exhibited at an end-of-semester design expo. Students responsible for contributing towards their design project budget and poster costs, and purchasing safety glasses (approximately \$75).

Requisites: Restricted to College of Engineering majors with 75 or less cumulative hours.

GEEN 2024 (3) Materials for Engineers

Examines structure, properties, processing and uses of metallic, polymeric, ceramic and composite materials. Specific topics covered include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical and electrical behavior and failure modes. Approach incorporates both materials science and materials engineering applications.

Requisites: Requires a prerequisite course of PHYS 1110 (minimum grade C). Restricted to College of Engineering students only.

Grading Basis: Letter Grade

GEEN 2400 (3) Engineering Projects for the Community

Design engineering products for local community clients, with emphasis on humanitarian engineering and integrated systems with electrical, mechanical, and software components. Students are challenged to take design projects to a higher level by requiring an additional iteration through the design cycle and more engaged user-testing, in order to infuse student projects with the robustness necessary for public-use products.

Requisites: Requires prerequisite course of GEEN 1400 or COEN 1410 or ASEN 1400 or ECEN 1400 (minimum grade C). Restricted to College of Engineering majors only.

Grading Basis: Letter Grade

GEEN 2851 (3) Statics for Engineers

Examines vector treatment of force systems and their resultants; equilibrium of frames and machines, including internal forces and three-dimensional configurations; static friction; properties of surfaces, including first and second moments; hydrostatics; and minimum potential energy and stability.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 2121 and MCEN 2023

Requisites: Requires prerequisite course of PHYS 1110 (minimum grade C-). Requires a prerequisite or corequisite course of APPM 2350 or MATH 2400. Restricted to College of Engineering majors only.

GEEN 3010 (3) Basic Electronics

Examines basic concepts of electricity, digital systems, circuit design and circuit analysis. Specific topics covered include analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis. Thevenin and Norton theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits, operational amplifiers and microcontrollers.

Requisites: Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of APPM 2360 (all minimum grade C). Restricted to College of Engineering undergraduate majors only.

Grading Basis: Letter Grade

GEEN 3400 (3) Invention and Innovation

Introduction to invention and product innovation with a hands-on approach. Students explore the invention process, hone their engineering design skills, and explore the initial stages of entrepreneurship (patenting, intellectual property, marketing research, and raising capital). Student teams design, create, and test a potentially commercial product, and exhibit at an end-of-semester design expo.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

GEEN 3830 (1-3) Special Topics

Explores topics of interest in engineering. Content varies by instructor and semester.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to College of Engineering undergraduate students only.

GEEN 3852 (3) Thermodynamics for Engineers

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 3012

Requisites: Requires prerequisite course of APPM 2350 or MATH 2400 (minimum grade C-). Restricted to College of Engineering majors only.

GEEN 3853 (3) Fluid Mechanics for Engineers

Introduces fluid mechanics and momentum transfer, emphasizing the application of these principles to engineering systems.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 3200 and CVEN 3313 and MCEN 3021

Requisites: Requires prerequisite courses of APPM 2350 or MATH 2400 and CHEN 2120 or MCEN 2023 or CVEN 2121 (all minimum grade C-).

Requires a prerequisite or corequisite course of APPM 2350. Restricted to College of Engineering majors only.

GEEN 4400 (3) Teaching Design

For pre-service math, science and engineering educators, this course focuses on teaching engineering design in secondary schools. Students examine the process of teaching hands-on design, including scoping, stages of team evolution, development of engineering identity and iteration. Students engage in practice of integrating design thinking into secondary math/science curriculum, develop ready-to-use tools and resources and explore the design education literature.

Requisites: Requires prerequisite courses of GEEN 1400 and EDUC 4060 (all minimum grade B). Requires corequisite course of GEEN 3400.

Restricted to Engineering Plus (GEEN) majors in CU Teach math, biology, chemistry or physics (TMMA, TSBI, TSCH, TSPH).

Grading Basis: Letter Grade

GEEN 4830 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Engineering and Applied Science BS students or BS/MS Concurrent Degree Students only.

GEEN 4848 (1-6) Independent Study

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Engineering Plus (GEEN) students only.

Grading Basis: Letter Grade

Geography (GEOG) Courses

GEOG 1001 (4) Environmental Systems: Climate and Vegetation

Lect. and lab. Introduces the atmospheric environment of the Earth: elements and controls of climate and their implications for hydrology, vegetation, and soils. Emphasizes distribution of physical features across the Earth's surface and interactions between humans and their environment, especially those leading to global change on the decade to century time scale.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science

MAPS Course: Natural Science Lab or Lab/Lec

GEOG 1011 (4) Environmental Systems: Landscapes and Water

Lect. and lab. Introduces landscapes and flowing water, emphasizing the formation and geographic distribution of mountains, volcanoes, valleys, and deserts, and their shaping by rivers and glaciers. Includes field trips.

Additional Information: GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Departmental Category: Physical Geography

MAPS Course: Natural Science

MAPS Course: Natural Science Lab or Lab/Lec

GEOG 1962 (3) Geographies of Global Change

Familiarizes students with a geographic understanding of conflicts around the globe and of economic, political and cultural globalization.

Analyzes the relationship between global forces, regions and local interests in contemporary territorial and geopolitical tensions and conflicts, emphasizing issues such as nationalism, migration, labor and natural resources. Formerly GEOG 2002.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

MAPS Course: Geography

GEOG 1972 (3) Environment-Society Geography

Examines interactions between humans and the environment across the globe from a geographical perspective. Introduces different analytical perspectives through which to understand nature-society relationships, with a focus on social, cultural and political-economic dimensions, and examples from different natural resource sectors (e.g., water, agriculture) and countries. Formerly GEOG 2412.

Additional Information: Departmental Category: Human and Cultural Geography

MAPS Course: Geography

GEOG 1982 (3) World Regional Geography

Introduces a comparative framework for recognizing and understanding world regions. Units combine historical understanding with discussion of problems and challenges that face them, including discussion of economic growth, inequality, political conflict, colonialism, race and climate change.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

MAPS Course: Geography

GEOG 1992 (3) Human Geographies

Examines social, political, economic, and cultural processes creating the geographical worlds in which we live, and how these spatial relationships shape our everyday lives. Studies urban growth, geopolitics, agricultural development and change, economic growth and decline, population dynamics, and migration exploring both how these processes work at global scale as well as shape geographies of particular places.

Additional Information: Departmental Category: Human and Cultural Geography

MAPS Course: Geography

GEOG 2053 (3) Mapping a Changing World

Examines roles that maps, geospatial data and technology play in understanding and explaining our world. Topics introduce map reading, GPS, drones, web mapping and spatial data in social networks. Class discussions and assignments include critical thinking about maps as propaganda and as tools of social and political power. Hands-on exercises demonstrate skills for map exploration of natural and societal worlds.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 2271 (3) Introduction to the Arctic Environment

Rising temperatures and shrinking sea ice are only the most visible indications of a rapidly changing Arctic. This course addresses the climate of the Arctic and the changes being observed at a non-mathematical level. It is intended to provide students with a basic understanding of the Arctic physical environment.

Additional Information: Departmental Category: Physical Geography

GEOG 2852 (3) Contemporary Southeast Asia: Environmental Politics

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

Equivalent - Duplicate Degree Credit Not Granted: ASIA 2852

Grading Basis: Letter Grade

GEOG 3022 (3) Climate Politics and Policy

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3022

Recommended: Prerequisite ENVS 1000 or GEOG 1972.

GEOG 3023 (4) Statistics for Geography

Introduces parametric and distribution-free statistics, emphasizing applications to earth science problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3023

Additional Information: Departmental Category: Techniques (Skills)

GEOG 3053 (4) Cartography: Visualization and Information Design

Introduction to the fundamentals of cartography, the science and art of map design. Emphasis on map projections, symbolization and the design of maps with computers. Students produce series of thematic maps with modern computer-assisted techniques.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite basic familiarity with computers and an introductory course in statistics (may be taken concurrently).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 3251 (3) Mountain Geography

Surveys mountain environments and their human use with illustrations from temperate and tropical mountain areas.

Additional Information: Departmental Category: Physical Geography

GEOG 3301 (3) Analysis of Climate and Weather Observations

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3300

Requisites: Requires prerequisite courses of APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 and ATOC 1050 and ATOC 1060 or GEOG 3601 or ATOC 3600 or ENVS 3600 or GEOG 1011 (all minimum grade D-).

Recommended: Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENVS 3600 or GEOG 1001 and one semester calculus.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 3351 (3) Biogeography

Surveys and analyzes plant and animal distributions on a world scale from ecological and historical perspectives. Emphasizes human impact on species.

Requisites: Requires prerequisite course of GEOG 1001 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 3402 (3) Natural Hazards

Explores the impacts of extreme geophysical events on human society. Emphasizes adaptations to extreme events and ways of reducing vulnerability and damage.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3412 (3) Conservation Practice and Resource Management

Studies policy and management of natural resources. Emphasizes practical approaches to the conservation and management of soil, land, water and air resources.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3422 (3) Political Ecology

Introduces students to political ecology, an influential approach to understanding society-environment relationships. Explores issues including different philosophies of nature and wilderness, the politics of conservation, causes of environmental degradation, environmental conflict and indigenous ecological knowledge.

Recommended: Prerequisite GEOG 1972.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3511 (4) Introduction to Hydrology

Examines hydrologic processes in the surface environment, emphasizing the environment of the western United States. Emphasizes natural processes and their management to augment water resources.

Requisites: Requires a prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 3601 (3) Principles of Climate

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3600 and ENVS 3600

Requisites: Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors or Atmospheric Oceanic Sciences (ATOC) minors only.

Recommended: Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 3612 (3) Geography of American Cities

Introduces geography of American cities. Includes demographic and ideological contexts of urban development, emergence of the city system, location theory and rent models, and urban-economic problems.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3662 (3) Economic Geography

Presents theories of the spatial organization of economic production, consumption and exchange systems. Geographical dynamics of industrialization, urbanization and economic growth. Examination of property, labor and social conflict, with a focus on political economy.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3672 (3) Gender and the Global Economy

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation, and women's social movements worldwide.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3672

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Human and Cultural Geography

GEOG 3682 (3) Geography of International Development

Compares and contrasts global characteristics and processes of development, emphasizing the developing countries of the world. Integrates theories of development, specific development topics, and case studies to explore the problems of development.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 3692 (3) Introduction to Global Public Health

Introduces global health by putting its contemporary definition, determinants, development and direction as a field into a broad global context. The course is divided into four core topics: 1) the burden and distribution of disease and mortality; 2) the determinants of global health disparities; 3) the development of global health policies; and 4) the outcomes of global health interventions. Required for the Public Health Certificate.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3742 (3) Place, Power, and Contemporary Culture

Presents a radical reexamination of the geography of culture. Examines the relationship between places, power, and the dynamics of culture. Explores how the globalization of economics, politics, and culture shapes local cultural change. Looks at how place-based cultural politics both assist and resist processes of globalization.

Recommended: Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Human and Cultural Geography

GEOG 3812 (3) Mexico, Central America, and the Caribbean

Introduces the geography of Latin America, focusing on the lands and peoples of Mexico, Central America, and the Caribbean. Examines regional and national culture, history, environment, and population, as well as ongoing environmental and socioeconomic changes.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3822 (3) Geography of China

Surveys the world's most populous country, examining physical and historical geography, urbanization and regional development, agriculture, population, energy, and the environment. Seeks to situate China's development in a broader Asian and global context.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Human and Cultural Geography
Departmental Category: Asia Content

GEOG 3832 (3) Geographies of South Asia

Examine the geographies of South Asia through four interrelated themes: Territory, Trade, Transportation, and Tributaries. Learn about territory including physical features, political conflicts and changing borders. Explore trade, transportation routes, and tributaries to understand economic, social/cultural and political geographies. Investigate culture and society through analyses of gender roles/relations.

Recommended: Prerequisites GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 3840 (1-6) Undergraduate Independent Study

Provides an independent study opportunity, by special arrangement with faculty, for students presenting strong geography preparation. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Geography (GEOG) majors only.

GEOG 3842 (3) Human Geography of Czechia: Political, Economic and Social Transitions

Excursions in Prague will begin with an understanding of Czech history through various imprints on the landscape, such as city planning, design, architecture and culture. This will be followed by a discussion of Prague in the 20th century and the various political, economic and social transitions. These transitions will be explored through field based study in and outside of Prague.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3862 (3) Geography of Africa

Studies physical and cultural regions of Africa. Analyzes and compares the development of present nation-states and contemporary geographic issues including globalization, conservation, public health and food security.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 3882 (3) Geography of the Former Soviet Union

Examines the contemporary social, political, population, cultural, ethnic and resource geography of the former Soviet Union. Relations between Russia and neighboring countries are also considered. Historical and physical geography are introduced as background to understanding post-Soviet developments and challenges.

Grading Basis: Letter Grade

GEOG 3930 (3) Internship

Provides an academically supervised opportunity for advanced geography or environmental studies majors to work in public and private organizations on projects related to the student's career goals and to relate classroom theory to practice. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors only.

GEOG 4023 (4) Introduction to Quantitative Methods in Human Geography

Introduces fundamental statistical and quantitative modeling techniques widely used in geography today. Emphasizes geographic examples and spatial problems, as are statistical routines now available on most computers.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5023

Requisites: Requires prerequisite course of GEOG 3023 (minimum grade D-).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4043 (4) Cartography 2: Interactive and Multimedia Mapping

An advanced course in interactive, multimedia, animated and Web-based cartography stressing the important role digital cartography plays in cyberspace. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5043

Requisites: Requires prerequisite course of GEOG 3053 (minimum grade C-).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5093 and GEOL 4093 and GEOL 5093

Requisites: Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4100 (1-3) Special Topics in Geography

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4110 and GEOG 4120.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

GEOG 4103 (4) Introduction to Geographic Information Science

Examines construction and use of an information system and its data specifically designed for representing and manipulating geographical data. Emphasizes modern geographical information systems including computer hardware/software with a collection of methods/procedures for recording, transforming, storing/retrieving, analyzing, and mapping geographic data.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5103

Requisites: Requires prereq crs of GEOG3053 ANTH4000 or APPM4570 or BCOR1020 or ECON3818 or GEOG3023 or GEOL3023 or MATH2510 or PSCI2075 or PSYC2111 or SOCY2061 or 4061 (all min grade C-).

Restricted to students with 57-180 credits (JR/SR) ENVS or GEOG mjrs only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4110 (1-4) Special Topics in Geography

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4120.

Repeatable: Repeatable for up to 8.00 total credit hours.

GEOG 4120 (1-3) Special Topics in Geography

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. See also GEOG 4100 and GEOG 4110.

Repeatable: Repeatable for up to 6.00 total credit hours.

GEOG 4173 (3) Research Seminar

Examines the nature of research and develops pregraduate skills for geographic research, emphasizing problem definition, methods, sources, data interpretation, and writing. Recommended for students pursuing honors.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Geography (GEOG) or Environmental Studies (ENVS) majors only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4201 (3) Biometeorology

Interdisciplinary science, studying the interactions between atmospheric processes and living organisms (plants, animals, and humans).

Discusses how organisms adapt to a changing environment. Uses a practical, problem-solving approach to explore these interactions.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4201

Requisites: Requires prereq of GEOG 1001 any of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (min grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4203 (4) Geographic Information Science: Modeling Applications

Extends basic GIS concepts and mechanics. Develop GIS models for human and environmental applications. Grid and vector data models, tessellated and hierarchical data structures, terrain representation, interpolation and kriging, spatial regression. Small group projects design, implement and run GIS models.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5203

Requisites: Requires prerequisite course of GEOG 4103 (minimum grade C-).

Recommended: Requisite working knowledge of GIS software.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4241 (4) Principles of Geomorphology

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4241

Requisites: Requires prereq crs GEOG 1011 or GEOL 1010 or 1020 or 1030 or 1040 or 1060 and APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or 1300 or 1310 (min grade D-). Restricted to students with 57-180 credits (Jr/Sr) EVOC, GEOG, GEOL, ENVS mjrs only

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Physical Geography

GEOG 4251 (4) Fluvial Geomorphology

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5251

Requisites: Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

Recommended: Prerequisite GEOG 3023.

Additional Information: Departmental Category: Physical Geography

GEOG 4261 (3) Glaciers and Permafrost

Surveys the major terrestrial components of the cryosphere, including permafrost, glaciers and ice sheets. Emphasizes physical processes involving ice, including thermal behavior, ice deformation and mass balance, but also considers biogeochemical processes and landforms associated with ice. The climate context, including human interactions and recent climate history, will be considered. Taught in a combination lecture-seminar format.

Requisites: Requires prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

Recommended: Prerequisite GEOG 4241.

Additional Information: Departmental Category: Physical Geography

GEOG 4271 (3) The Arctic Climate System

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5271

Requisites: Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

Recommended: Prerequisites GEOG 3511 or GEOG 3601 or ATOC 3600 or ENVS 3600 and statistics.

Additional Information: Departmental Category: Physical Geography

GEOG 4292 (3) Migration, Immigrant Adaptation, and Development

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5292 and ECON 4292

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4303 (4) GIS Programming for Spatial Analysis

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data. Covers concepts, principles and techniques of programming and solving spatial problems in physical and human geography.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5303

Requisites: Requires prerequisite course of GEOG 4103 (minimum grade C-).

Recommended: Prerequisite GEOG 4203.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 4311 (3) Watershed Biogeochemistry

Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling.

Requisites: Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

Recommended: Requisite parametric statistics.

Additional Information: Departmental Category: Physical Geography

GEOG 4321 (3-4) Snow Hydrology

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5321

Requisites: Requires prerequisite course of APPM 1340 1345 or APPM 1350 or 4570 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4331 (3-4) Mountain Climatology

Surveys and analyzes climatic characteristics of mountain environments worldwide.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5331

Requisites: Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4371 (3) Forest Geography: Principles and Dynamics

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5371

Requisites: Requires prerequisite course of GEOG 1001 (minimum grade D-).

Additional Information: Departmental Category: Physical Geography

GEOG 4401 (3) Soils Geography

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5401

Requisites: Requires prerequisite course of GEOG 1011 (minimum grade D-).

Recommended: Prerequisite inorganic chemistry.

Additional Information: Departmental Category: Physical Geography

GEOG 4403 (3) Space Time Analytics

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands on, flipped classroom approach with in-class development of technical skills.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5403

Requisites: Requires a prerequisite course of GEOG 3023 or GEOG 4023 (minimum grade C-).

GEOG 4430 (3) Seminar: Conservation Trends

Provides environmental studies or geography majors with an undergraduate format for interdisciplinary discussion and research into current and future directions of conservation.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOG 4463 (3) Earth Analytics Data Science Bootcamp

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5463

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

GEOG 4501 (3) Water Resources and Water Management of Western United States

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5501

Additional Information: Departmental Category: Physical Geography

GEOG 4503 (3) GIS and Geospatial Project Management

Managing a geospatial project encompasses problem design, analysis and team dynamics. The class mixes lectures and class exercises with student-selected projects. Lectures run concurrent with projects, working through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5503

Requisites: Requires prerequisite course of GEOG 3053 or GEOG 4103 (minimum grade C-).

GEOG 4563 (3) Earth Analytics

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5563

Requisites: Requires prereq course of APPM 1340 and 1345 or one of following: GEOG 4023, 4103, 3023, APPM 1350, 4570, ECON 1088, 3818, MATH 1081, 1300, 1310, 2510, 3510, ANTH 4000, BCOR 1020, GEOL 3023, PSCI 2075, PSYC 2111, SOCY 2061 or EBIO 4410 (min grade C).

Grading Basis: Letter Grade

GEOG 4603 (3) GIS in the Social and Natural Sciences

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5603

GEOG 4622 (3) City Life

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5622

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4632 (3) Development Geography

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5632

Requisites: Requires prerequisite course of GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 (minimum grade D-).

Recommended: Prerequisite GEOG 3682.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4712 (3) Political Geography

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5712

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or IAFS 1000 or PSCI 2012 or PSCI 2223.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4722 (3) Field Methods in Human Geography

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5722

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4732 (3) Population Geography

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5732

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4742 (3) Topics in Environment and Society

Studies peoples and their environments, including human modification of nature and cultural interpretation and construction of rural and urban landscapes.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4762 (3) Geographies of Political Islam: Empire, Terror and Revolution

Explores the postcolonial landscape of political Islam through the lens of political and cultural geography. Develops a critical anti-essentialist framework for understanding the political crisis of the Muslim world in relation to broader questions of empire, nationalism, democracy, revolution, security, terrorism, globalization and modernity. Focuses on the post-1979 period, several key Muslim nation-states (Saudi-Arabia, Egypt, Iran, Turkey, Pakistan) and movements (Taliban, ISIS).

Recommended: Prerequisite GEOG 1982 or GEOG 1992 or GEOG 3742.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4812 (3) Environment and Development in South America

Presents theoretical approaches to the links between environment and development in Latin America and focuses on analytical discussion of contemporary (and controversial) issues in sustainable development in South America. Examines social, ecological, economic, and political forces influencing the use of natural resources.

Recommended: Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 3812 or GEOG 3422 or ANTH 3110 or PSCI 3032.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4822 (3) Environment and Development in China

Examines key environmental problems in relation to China's rapid modernization and development.

Recommended: Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or HIST 1618.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 4832 (3) Geography of Tibet

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5832

Recommended: Prerequisite GEOG 3822 or other classes on China.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 4852 (3) Health and Medical Geography

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 5852

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites GEOG 1001 or GEOG 1011 and GEOG 1962 or GEOG 1972 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4892 (3) Geography of Western Europe

Provides a regional survey of cultural, political, economic, social, and physical geography of Western Europe, emphasizing the distinctive character and problems of each major area and the relationship of the region to the world.

Recommended: Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 4990 (3) Senior Thesis

Offers thesis research under faculty supervision. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Geography (GEOG) majors only.

GEOG 5003 (4) Elements of Geographic Information Systems

Discusses incorporating GIS methods into graduate thesis or dissertation research. Reviews basic mapping concepts (scale and projections), acquiring different types of spatial data (raster and vector), building an error-free database, making simple queries, overlays, charts, and maps. Intended for students who want to learn GIS but lack background skills in computing or cartography.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite some experience with Mac or Windows.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5023 (4) Introduction to Quantitative Methods in Human Geography

Introduces fundamental statistical and quantitative modeling techniques widely used in geography today. Emphasizes geographic examples and spatial problems, as are statistical routines now available on most computers.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4023

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5043 (4) Cartography 2: Interactive and Multimedia Mapping

An advanced course in interactive, multimedia, animated and Web-based cartography stressing the important role digital cartography plays in cyberspace. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4043

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4093 and GEOL 4093 and GEOL 5093

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5100 (1-4) Special Topics: Geography

Covers various topics outside of the normal curriculum; offered intermittently depending on student demand and availability of faculty.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 5103 (4) Geographic Information Systems

Examines construction and use of an information system and its data specifically designed for representing and manipulating geographical data. Emphasizes modern geographical information systems including computer hardware/software with a collection of methods/procedures for recording, transforming, storing/retrieving, analyzing, and mapping geographic data.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4103

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5113 (3) Seminar: Geographic Information Systems

Focuses on the current research topics in geographical information systems and selected areas of application. Includes major journal articles related to each topic. Students complete and present a seminar paper.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 4103 or GEOG 5103 or instructor consent required.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5152 (3) History and Theory of Geography

History of ideas and institutions that have shaped contemporary geographic inquiry. Examines the evolving relations among human geography, physical geography, environment-society relations, and geographic information processing. Designed to situate graduate student research within major subfields and intellectual currents of geography.

Requisites: Restricted to Geography (GEOG) graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5161 (3) Research Design in Geography

The human section reads and discusses contemporary research philosophies and methodologies in human geography. Practices the development of research proposals and presentation of research ideas and results. The physical section reads and discusses contemporary research philosophies and methodologies in physical geography (climatology, geomorphology, biogeography, and soils geography). Practices the development of research proposals and presentation of research ideas.

Requisites: Restricted to Geography (GEOG) graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5203 (4) Geographic Information Science: Modeling Applications

Extends basic GIS concepts and mechanics. Develop GIS models for human and environmental applications. Grid and vector data models, tessellated and hierarchical data structures, terrain representation, interpolation and kriging, spatial regression. Small group projects design, implement and run GIS models.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4203

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 4103 or GEOG 5103 or working knowledge of GIS software or instructor consent required.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5211 (3) Seminar: Physical Climatology

Involves a research seminar concerned with problems of mass and energy exchange in the Earth-atmosphere system. Selects topics from such areas as air quality, bioclimatology, hydrology, climate change, and the climates of urban, agricultural, and natural environments.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5221 (3) Synoptic and Dynamic Climatology

Examines global climates from the standpoint of synoptic and dynamic climatology.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5241 (1-3) Topics in Physical Geography

Presents recent research topics that vary from year to year. Consult the online Schedule Planner for specific topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5251 (4) Fluvial Geomorphology

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4251

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5271 (3) The Arctic Climate System

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4271

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5292 (3) Migration, Immigrant Adaptation, and Development

historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4292 and ECON 4292

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5303 (4) GIS Programming for Spatial Analysis

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data. Covers concepts, principles and techniques of programming and solving spatial problems in physical and human geography.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4303

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 5321 (3-4) Snow Hydrology

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4321

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5331 (3-4) Mountain Climatology

Surveys and analyzes climatic characteristics of mountain environments worldwide.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4331

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5371 (3) Forest Geography: Principles and Dynamics

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4371

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5391 (3) Seminar: Biogeography

Considers in detail current research themes in biogeography. Includes intensive reading of current research literature and preparation of research papers. Topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5401 (3) Soils Geography

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4401

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5403 (3) Space Time Analytics

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands on, flipped classroom approach with in-class development of technical skills.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4403

Requisites: Restricted to graduate students only.

GEOG 5463 (3) Earth Analytics Data Science Bootcamp

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4463

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

GEOG 5501 (3) Water Resources and Water Management of Western United States

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4501

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 5503 (3) GIS and Geospatial Project Management

Managing a geospatial project encompasses problem design, analysis and team dynamics. The class mixes lectures and class exercises with student-selected projects. Lectures run concurrent with projects, working through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4503

Requisites: Requires prerequisite course of GEOG 5103 (minimum grade C-).

GEOG 5563 (3) Earth Analytics

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4563

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

GEOG 5603 (3) GIS in the Social and Natural Sciences

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4603

GEOG 5622 (3) City Life

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4622

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5632 (3) Development Geography

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4632

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5642 (3) Seminar: Urban Geography

Surveys current research topics in urban geography. Emphasizes definition of possible student thesis topics.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5652 (3) Introduction to Social Theory

Surveys theoretical paradigms in the social sciences. Includes canonical works from the history of the social sciences as well as contemporary theorists. Appropriate for beginning to advanced graduate students doing qualitative research.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5662 (3) Seminar: Topics in Economic Geography

Covers selected topics emphasizing faculty specialties. Topics vary with instructor. Check with department for semester offerings.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5663 (3) Earth Analytics Applications

Develop expertise in finding, organizing, managing and processing large, heterogeneous, spatio-temporal data to address a real-world problem.

Students will work collaboratively on semi-guided science project.

Students gain critical skills required to understand data structures, utilize APIs, extract insight from data and understand how uncertainty propagates. Culminates with a formal presentation of project results.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites GEOG 4463 or GEOG 4563 or GEOG 5463 or GEOG 5563.

Grading Basis: Letter Grade

GEOG 5712 (3) Political Geography

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4712

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5722 (3) Field Methods in Human Geography

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4722

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5732 (3) Population Geography

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4732

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5782 (3) Sustainable Development: Critique

Investigates historical and contemporary theories and critiques of development and their implications for geographic theory and method. Focuses on the role of representation in evaluating case studies and examining the potential for a sustainable development.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5832 (3) Geography of Tibet

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4832

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

Departmental Category: Asia Content

GEOG 5840 (1-3) Graduate Independent Study

Offers independent research for master's students only. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 5852 (3) Health and Medical Geography

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4852

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 5930 (3) Advanced Internship

Provides an academically supervised opportunity for graduate-level geography majors to work in public and private organizations on advanced projects related to geographic theory and their career goals. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 5961 (3) Theories of Climate and Climate Variability

Critically reviews current theories of climatic variability based on analysis of the different physical processes affecting climate.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 6180 (1-3) Seminar: Geographic Problems

Applies research methods to selected problems. Topics vary with instructor.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

GEOG 6211 (1-3) Readings in Climatology

Discusses selected topics in current climatological literature. Specific themes vary.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Physical Geography

GEOG 6402 (3) Seminar: Political Ecology

Critically examines the politics of human-environment relationships across cultures and societies. Focuses on environmental degradation, change and management from the perspectives including political economy, cultural politics, STS and post structural theory.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6443 (2) Remote Sensing Field Methods

Theory and practical field measurements for validation of airborne and spaceborne spectral image acquisition. Emphasizes radiative scattering properties of soil, vegetation, cryosphere and atmosphere. Focuses on characterization and calibration of instrumentation to measure these properties.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 6440

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 5093 or GEOL 5093.

Additional Information: Departmental Category: Techniques (Skills)

GEOG 6712 (3) Seminar: Political Geography

Considers in detail history and methodology of the field, including an analysis of selected systematic topics such as frontiers and boundaries, international rivers, conflicting claims to territory, and electoral geography.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6732 (3) Formal Population Geography: Analysis and Forecasting

In-depth introduction to formal demography. In addition to learning the basic demographic tools used nowadays in fertility, marriage, mortality, migration and forecasting/projections, it also looks at some potential links between formal and statistical demographic work that would enable the student to apply some of the methods learnt in an econometric or multivariate setting.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite GEOG 5023.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6742 (3) Seminar: Cultural Geography

Explores various geographic topics emphasizing the concept of culture. Emergence of several points of view in the development of cultural geography.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Human and Cultural Geography

GEOG 6940 (1) Master's Degree Candidate

Instructor consent required.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

GEOG 6950 (1-6) Master's Thesis

Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

GEOG 7840 (1-3) Graduate Independent Study

Offers independent research for doctoral students only. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

GEOG 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section. Instructor consent required.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Geological Sciences (GEOL)

Courses

GEOL 1010 (3) Introduction to Geology

Introductory geology for majors and non-majors. Studies Earth, its materials, its characteristics, its dynamic processes, and how it relates to people. Separate lab (GEOL 1030) is recommended.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Natural Science

GEOL 1020 (3) Introduction to Earth History

Examines how Earth's interior and surface, the atmosphere and climate, the oceans, and life interact and have changed over the immensity of geologic time. For majors and non-majors. Separate lab (GEOL 1030) is recommended.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 1040

Requisites: Requires prerequisite course of GEOL 1010 (minimum grade D-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 1030 (1) Introduction to Geology Laboratory 1

Features field trips to local points of geologic interest. Studies rocks and topographic and geologic maps. Meets the MAPS requirement for natural science lab, if taken with GEOL 1010.

Recommended: Requisite prior or current registration in 1000-level geology course.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

GEOL 1040 (3) Geology of Colorado

Reviews the geologic evolution and history of Colorado. It first develops the basic concepts needed to interpret the geology and then systematically shows how the state evolved through geologic time. Designed for those who enjoy understanding the beauty and splendor of the state.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 1020

Additional Information: Arts Sci Core Curr: Natural Science Sequence

GEOL 1060 (3) Global Change: An Earth Science Perspective

Focuses on evidence for planetary warming, climate change, glacier and ice-sheet melting and sea level rise both now and in the recent past.

Attempts to develop understanding of the interactions within the coupled Earth system that regulate such changes. Utilizes examples from the geological and instrumental records, and evaluates the global warming forecast. Department enforced prerequisite: GEOL 1010 (minimum grade D-).

Equivalent - Duplicate Degree Credit Not Granted: ATOC 1060

Additional Information: Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Natural Science

GEOL 2001 (4) Planet Earth

Explores the dynamics of planet Earth with particular emphasis on the factors that make the planet habitable. Includes examination of heat balance, hydrology, geomorphology, biogeochemistry and climate history through both lecture and lab-based activities. Required for the Geology major, introduces students to the major concepts in contemporary Earth system science.

Requisites: Requires prerequisite course of GEOL 1010 or GEOL 2100 or ENVS 1000 (minimum grade D-).

GEOL 2005 (4) Introduction to Earth Materials

Provides introduction to the classification, composition and properties of the materials that compose the Earth, how these materials are studied, and how they are used to interpret Earth history and processes. Required for the Geology major.

Requisites: Requires prerequisite courses of GEOL 1010 or GEOL 2100 and CHEM 1113 and CHEM 1114 (all minimum grade D-).

GEOL 2040 (3) The Search for Life in the Universe

Introduces the scientific basis for the possible existence of life elsewhere in the universe. Includes origin and evolution of life on Earth and the search for evidence of life in our solar system, including Mars and Jupiter's moon Europa. Discusses the conditions necessary for life and whether they might arise on planets around other stars.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 2040

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 2100 (3) Environmental Geology

Introduces the influences of geologic processes on human lives and the changes human actions cause in geologic systems. Uses examples and case studies from Colorado and the West.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 2700 (2) Introduction to Field Geology

Introduces basic field techniques necessary to collect geologic data and samples, and necessary to map geologic units.

Requisites: Requires prerequisite courses of GEOL 1010 and GEOL 1030 and GEOL 2005 (all minimum grade D-).

GEOL 3010 (3) Introduction to Mineralogy

Covers origin, occurrence, identification, classification, and uses of minerals with emphasis on applications of mineralogy to economic geology and petrology. Two lectures and one lab per week.

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 and GEOL 2005 and MATH 1300 or APPM 1350 (all minimum grade D-).

Recommended: Prerequisite GEOL 2005.

GEOL 3020 (3) Petrology

Studies field relations, petrography, petrology, chemistry, and origins of igneous and metamorphic rocks by means of lectures, reading, and lab and field experience. Labs include instruction in the fundamentals of optical petrography and the study of rocks in thin section.

Requisites: Requires prerequisite course of GEOL 2005 or GEOL 3010 (minimum grade D-).

GEOL 3023 (4) Statistics for Geography

Introduces parametric and distribution-free statistics, emphasizing applications to earth science problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3023

GEOL 3030 (3) Introduction to Hydrogeology

Introduces groundwater flow concepts, hydrologic cycle, physical and chemical properties, flow net, hydraulic potential, geologic controls on heterogeneity and anisotropy, aquifers and aquitards in a geologic system, saturated and unsaturated flow, flow to a well, pumping tests, and role of groundwater in geologic processes.

Requisites: Requires prerequisite courses of GEOL 1010 and MATH 1300 or APPM 1350 (all minimum grade D-).

GEOL 3040 (3) Global Change: The Recent Geological Record

Geological records in lakes, oceans, deserts, and around glaciers indicate the significant changes in the global systems that have taken place over the last few hundred or thousand years. Explores the timing and nature of these changes. Department enforced prerequisites: any two-course sequence of natural science core courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4070

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 3050 (2) GIS for Geologists

Provides an introduction to Geographic Information Systems (GIS) techniques focused on geological applications. Covers GIS analyzing, mapping and GPS use. Basic computer skills are a plus before entering the class.

GEOL 3070 (3) Introduction to Oceanography

Explores Earth's dynamic oceans. Discusses the disciplines of oceanography including marine geology, chemistry, biology and physical oceanography with emphasis on global change. Specific topics may include: tectonics, currents, biogeochemical cycles, ecology and global warming.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 3070

Recommended: Prerequisite any 1000-level ATOC or GEOL course or ATOC major.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 3090 (3) Developing Scientific Writing Skills

Focuses on the development of scientific writing skills. Enhances student ability to write professionally, revise text and review the work of others. Writing assignments integrate the subject matter of different topics in earth science. Department enforced prerequisites: a lower division writing course and one of the following: GEOL 2001 or GEOL 2005 or GEOL 2700 or GEOL 3010 or GEOL 3030 or GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 3820.

Additional Information: Arts Sci Core Curr: Written Communication

GEOL 3120 (4) Structural Geology

Introduces the basic principles and processes involved in deformation of natural rocks and minerals and the techniques used to analyze a variety of common geological structures (e.g., fractures, folds, fault zones).

Requisites: Requires prerequisite course of GEOL 1010 and GEOL 2005 (minimum grade D-).

Recommended: Prerequisite GEOL 2001.

GEOL 3130 (3) Global Warming: Understanding the Forecast

Uses the example of man-made climate change to develop an analytical understanding of the Earth system (solid, fluid, and living) that can be used to interpret the complex and uncertain forecast. Emphasis is given to the concepts of forcing, feedback and response in order to examine natural vs. man-made environmental changes and climate change mitigation strategies.

GEOL 3300 (3) Extraterrestrial Life

Discusses the scientific basis for the possible existence of extraterrestrial life. Includes origin and evolution of life on Earth; the possibility of life elsewhere in the solar system, including Mars; and the possibility of life on planets around other stars. Department enforced prerequisite: one-year sequence in a natural science.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 3300

GEOL 3320 (3) Introduction to Geochemistry

Introduces chemical principles as applied to geologic processes. Includes an introductory discussion of mineral and rock chemistry, aqueous geochemistry, and organic geochemistry.

Requisites: Requires prerequisite courses of CHEM 1113 and CHEM 1114 and MATH 1300 or APPM 1350 (all minimum grade D-).

GEOL 3410 (3) Paleobiology

Surveys morphology, ecology and evolution of ancient animal and plant life and their interactions on Earth. Fossils used to solve geological and biological problems. Department enforced prerequisites: GEOL 1010 and GEOL 1020 or GEOL 2005 or EBIO 1030 and EBIO 1040 or EBIO 1210 and EBIO 1220.

GEOL 3430 (4) Sedimentology and Stratigraphy

Introduces the study of sedimentary rocks emphasizing their origin, characteristics, and interpretation; and the principles and techniques for establishing the temporal order and spatial distribution of sedimentary layers.

Requisites: Requires prerequisite course of GEOL 2005 or GEOL 3010 (minimum grade D-).

Additional Information: Departmental Category: Geology

GEOL 3520 (3) Energy & Climate Change: An Interdisciplinary Approach

Examines sources of energy and other resources in light of their availability, use, environmental impact, as well as their impact on policy, economics and values. As fossil fuels are the dominant energy source today, particular emphasis is placed on climate impacts and the carbon cycle. All material is assessed through the lenses of the physical sciences, policy, ethics and economics. Department enforced prerequisite: a two-course sequence in any natural science.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3520

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

GEOL 3540 (3) Introduction to Petroleum Geology

Discusses the origin and distribution of conventional and unconventional petroleum resources, source rocks, types of traps and seals, reservoir rock properties, exploration methods (seismic data analysis and interpretation, formation evaluation, subsurface mapping), reservoir characterization and modeling, reserves calculations. Department enforced prerequisite: GEOL 1010.

Recommended: Corequisite GEOL 3430.

Additional Information: Departmental Category: Geology

GEOL 3720 (3) Evolution of Life: The Geological Record

Discusses the evolution of life on Earth, beginning with the earliest origins and surveying the major steps that led to the rise of higher plants and animals. Covers modern ideas on the causes of periodic mass extinctions in both the marine and terrestrial realms. Emphasizes geologic evidence for the pathways of evolution, using examples from the ordinary to the bizarre.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 3820 (4) The Fluid Earth

Examines the myriad forms of fluid behavior found on Earth, from the atmosphere to the inner core. Explores how basic principles of fluid physics may be used to understand a broad range of earth processes, including mantle convection, atmosphere and ocean dynamics, stream flow, lava spreading, and glacier motion, among others. Covers fundamental fluid concepts such as viscosity, pressure, convection, friction, and free-surface flow. Department enforced prerequisites: MATH 1300 or APPM 1340 and APPM 1345 or APPM 1350.

Recommended: Prerequisites GEOL 1010 and PHYS 1110.

GEOL 3930 (1-6) Internship

Offers an academically supervised opportunity for geological sciences majors to work with public or private organizations. Projects are usually associated with students' career goals; each project has an academic emphasis. Department enforced prerequisites: restricted to students with 57-180 credits (Juniors or Seniors) and completion of at least two courses (minimum grade B) for geology majors.

GEOL 3950 (3) Natural Catastrophes and Geologic Hazards

Surveys historic and prehistoric natural disasters, their cause and potential for recurrence. Meteorite impact, earthquakes, volcanic eruptions, tsunamis, landslides, floods, magnetic reversals and major extinction events. Department enforced prerequisite: one year of science.

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 4060 (4) Oceanography

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data. Department enforced prerequisite: one semester chemistry or physics or geology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5060

GEOL 4070 (3) Paleoclimatology

Covers the primary forcings and feedbacks that determine Earth's energy balance and the resultant climate system on decadal to millennial time scales. Covers ocean/atmosphere circulation, the role of ice sheets in the climate system, monsoons, Holocene climate change and 20th Century warming. Includes coverage of the proxies available to reconstruct climates of the past and the archives that contain these proxies. Department enforced prerequisite: environmental science or geology introduction sequence courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 3040

Recommended: Prerequisite natural science majors only.

GEOL 4093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors, as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5093 and GEOG 4093 and GEOG 5093

GEOL 4130 (3) Principles of Geophysics

Provides an introduction to fundamental geophysics including seismology, geomagnetism, gravity, radiometric dating, and heat flow with applications to plate tectonics and exploration of the subsurface.

Requisites: Requires prerequisite courses of MATH 1300 or APPM 1350 and PHYS 1110 and GEOL 1010 (all minimum grade D-).

GEOL 4150 (2) Planetary Field Geology

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5150

GEOL 4160 (3) Introduction to Biogeochemistry

Covers fundamentals of biogeochemical cycling, emphasizing water, carbon and nutrient dynamics in terrestrial ecosystems; chemical interactions of atmosphere, biosphere, lithosphere and hydrosphere; natural and human-managed environments. Department enforced prerequisites: GEOL 3320 or EBIO 3270 and CHEM 1011.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4160 and ENVS 4160

GEOL 4215 (3) Geochronology and Thermochronology

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5215

GEOL 4241 (4) Principles of Geomorphology

Studies weathering, mass-wasting, fluvial, wind, and marine processes and the resulting landforms.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 4241

Requisites: Requires prerequisite course of GEOG 1011 or GEOL 1010 and MATH 1300 or APPM 1350 or APPM 1340 and APPM 1345 (all minimum grade D-).

Additional Information: Arts Sci Core Curr. Natural Science Non-Sequence

GEOL 4270 (3) Marine Chemistry and Geochemistry

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical separation in seawater; the marine carbon cycle and its long-term control on atmospheric CO₂; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5270

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites introductory chemistry, introductory geology, introductory oceanography.

GEOL 4330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: upper-division undergraduate standing in physical science and upper-division undergraduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5330 and ASTR 4330 and ASTR 5330

GEOL 4474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups. Department enforced prerequisites: GEOL 1010 and GEOL 1020 and GEOL 3410.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5474

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOL 4500 (3) Critical Thinking in the Earth Sciences

Deals with controversies within the broad realm of geological sciences, including planetary geology, evolution, paleobiology, global change, environmental issues, plate tectonics, resources, other societal problems, or geologic thought in general. Students are provided the opportunity to analyze and debate scientific issues in the earth sciences. Department enforced prerequisites: GEOL 1010 and GEOL 1030 and GEOL 2001 or GEOL 2005 or GEOL 2700 (minimum grade D-).

Repeatable: Repeatable for up to 6.00 total credit hours.

GEOL 4550 (3) Petroleum Reservoir Characterization and Modeling

Introduces concepts and methods of petroleum reservoir analysis and 3-D reservoir modeling using subsurface data (cores, well logs, 3-D seismic) and outcrop analogs. Examines petroleum system, petrophysics (lithology, porosity, permeability, capillary pressure, flow units), and sequence-stratigraphic, facies, and structural controls on reservoir properties, heterogeneity and recovery efficiency. Deterministic and stochastic reservoir modeling methods are addressed. Department enforced prerequisites: GEOL 1010 and GEOL 3430.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5550

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOL 4670 (3) Isotope Geology

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5670

Requisites: Requires prerequisite a course of MATH 1300 or APPM 1350 (minimum grade D-).

GEOL 4675 (3) Stable Isotopes in Paleoclimate and Paleoecology

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5675

Grading Basis: Letter Grade

GEOL 4700 (1-4) Special Geological Topics

Studies in selected geological subjects of special current interest (for undergraduates).

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

GEOL 4711 (2) Igneous and Metamorphic Field Geology

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units.

Requisites: Requires prerequisite courses of GEOL 3020 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

GEOL 4712 (2) Structural Field Geology

Explores methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape.

Requisites: Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

GEOL 4714 (2) Field Geophysics

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic, and electrical measurements.

Requisites: Requires prerequisite courses of GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110 (all minimum grade D-).

GEOL 4715 (2) Field Techniques in Hydrogeology

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography, and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring stream flows, interpreting aquifer parameters from geophysical measurements, and using field data for water budget analysis.

Requisites: Requires prerequisite courses of GEOL 3030 and GEOL 2001 or GEOL 2700 (all minimum grade D-).

GEOL 4716 (2) Environmental Field Geochemistry

Develops basic field skills in the most commonly performed tasks required for the environmental characterization of solid and aqueous wastes. Media of study include soils, stream sediments, surface waters, ground waters, and atmospheric particulates.

Requisites: Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3320 and CHEM 1011 and CHEM 1031 or CHEM 1113 and CHEM 1133 (all minimum grade D-).

GEOL 4717 (2) Field Seminar in Geology and Tectonics

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S.

Requisites: Requires prerequisite courses of GEOL 2001 or GEOL 2700 and GEOL 3120 or GEOL 3320 or GEOL 3430 or GEOL 4241 (all minimum grade D-).

GEOL 4721 (2) Field Methods in Active Tectonics

Analysis of active geologic structures, including strike slip fault systems, secondary structures in stepovers and related eruptive centers. Includes the use of digital imagery, elevation models, offset geomorphic features and Quaternary deposits to determine local deformation rates and their relation to plate motions.

Requisites: Requires prerequisite courses of GEOL 2700 and GEOL 3120 (all minimum grade D-).

Recommended: Prerequisite GEOL 4712.

GEOL 4725 (1-4) Field Based Special Topics in Geoscience

Explores selected geological subjects of special interest in a field setting.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 5725

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

GEOL 4840 (1-3) Independent Study in Geology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4841 (1-3) Independent Study-Economic Geology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4842 (1-3) Independent Study-Petrology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4843 (1-3) Independent Study-Sedimentology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4844 (1-3) Independent Study-Structure/Tectonics

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4845 (1-3) Ind Stdy-Geochemistry

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4846 (1-3) Independent Study-Geophysics

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4847 (1-3) Independent Study-Hydrology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4849 (1-3) Independent Study-Paleontology

Time and credit to be arranged. For advanced undergraduates who have high scholastic standing. Open only upon consultation with department advisor. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours.

GEOL 4851 (1-3) Independent Study in Geoscience Education

Repeatable: Repeatable for up to 3.00 total credit hours.

GEOL 4990 (1-3) Honors Thesis

Supervised project involving original research in any area of the geological sciences. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended. Must be accepted by the departmental honors committee. Department enforced prerequisite: minimum cumulative GPA of 3.30.

Additional Information: Arts Sciences Honors Course

GEOL 5001 (3) Physics and Chemistry of the Solid Earth

Reviews the physical and chemical characteristics of the solid earth, from the core to the crust, and the processes that govern behavior through the earth. Lectures are supplemented with readings from the recent literature. Topics include convection, phase transitions, melt generation, forces of plate tectonics, origin of continents and lithosphere, continental tectonics, and earthquakes.

Requisites: Restricted to graduate students only.

Recommended: Requisite a course in basic chemistry and a course in physics.

Additional Information: Departmental Category: Graduate Course

GEOL 5002 (3) Physics, Chemistry, and Biology of Sedimentary Systems

Reading and discussion of current issues and themes in the stratigraphic sciences, including stratigraphic and facies analysis, spatial heterogeneity and self-organization, numerical modeling; origin, evolution, mass extinctions, and megatrajectories of life; and paleoceanographic and paleoclimatic signals in sedimentary rocks. Goal is to diversify students' understanding of the role of physics, chemistry, and biology in attacking research problems in sedimentary systems. Department enforced requisite, restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5060 (4) Oceanography

Examines the ocean as a system influencing the Earth's surficial processes and climate. Composition and properties of seawater, ocean circulation, waves, tides, coastal-, shallow-, and deep-water processes, biogeochemical cycles, deep sea sediments. Laboratory emphasizes the use of oceanographic data.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4060

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5080 (3) Advanced Hydrogeology and Modeling Concepts

Introduces advanced groundwater flow and modeling concepts, equations for steady state and transient flow, saturated and unsaturated flow, finite difference method, application of modeling in geologic processes, radial flow and aquifer parameters, infiltration and groundwater recharge, model calibration, verification and prediction.

Department enforced prerequisite: MATH 2300 or Fortran.

Additional Information: Departmental Category: Graduate Course

GEOL 5093 (4) Remote Sensing of the Environment

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4093 and GEOG 4093 and GEOG 5093

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5110 (3) Geomechanics

Introduces fundamental physical processes important to the transport of heat and mass in the Earth and on Earth's surface. Provides practice with quantitative treatment of geological problems. Solutions for each problem are derived from first principles, including conservation and flux laws. Emphasizes heat conduction and viscous fluid flow. Department enforced prerequisite: restricted to graduate students only and a course in calculus.

Additional Information: Departmental Category: Graduate Course

GEOL 5150 (2) Planetary Field Geology

Provides an overview of the geology, age and origins of the solid (rocky) planets, dwarf planets and moons of our solar system and the processes that form them from comparative studies from comparative geology. Includes modules on volcanism, rifting, aeolian processes, fluvial erosion, impacts, climate change and paleontology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4150

Additional Information: Departmental Category: Graduate Course

GEOL 5215 (3) Geochronology and Thermochronology

Constraining the timing of events and rates of processes is fundamental to earth science research. The field of geochronology and thermochronology is rapidly evolving. Cutting-edge aspects of geochronologic methods and emerging techniques will be especially emphasized. Lectures will emphasize the principles and assumptions of each technique. Seminar discussions will focus on recent papers that demonstrate state-of-the-art applications to diverse problems.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4215

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5270 (3) Marine Chemistry and Geochemistry

Examines the chemical, biological, geological and physical processes affecting (and affected by) the chemistry of the oceans. Topics include: chemical separation in seawater; the marine carbon cycle and its long-term control on atmospheric CO₂; the large-scale interdependence of nutrient distributions and biological productivity, chemical tracers of ocean circulation; the chemistry of marine sediments, including early diagenesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4270

Recommended: Prerequisites introductory chemistry, introductory geology, introductory oceanography.

Additional Information: Departmental Category: Graduate Course

GEOL 5280 (3) Aqueous and Environmental Geochemistry

Explores the fundamentals of low-temperature geochemistry to investigate element speciation and chemical behavior in waters, soils and sediments. Topics include water-rock interaction and weathering, mineral dissolution and precipitation reactions, aqueous complexation, mineral surface chemistry, kinetics, element cycles, and redox biogeochemistry. Includes exposure to spectroscopic tools, computer simulations and microbial geochemistry. Department enforced prerequisite: GEOL 3320 or 1 year of college chemistry.

Additional Information: Departmental Category: Graduate Course

GEOL 5305 (3) Global Biogeochemical Cycles

Focuses on the cycling of elements at the global scale with a particular emphasis on human modification of biogeochemical cycles. Major biogeochemical cycles, their past dynamics, present changes and potential future scenarios will be addressed. Ecosystem to global-scale model of the earth system will be discussed along with global scale measurements of element fluxes from satellites, aircraft and measurement networks. Department enforced prerequisite: restricted to graduate students only, general chemistry and some organic chemistry.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5840

Additional Information: Departmental Category: Graduate Course

GEOL 5330 (3) Cosmochemistry

Investigates chemical and isotopic data to understand the composition of the solar system: emphasis on the physical conditions in various objects, time scales for change, chemical and nuclear processes leading to change, observational constraints, and various models that attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular. Department enforced prerequisite: graduate standing in physical science and graduate chemistry or physics or math courses.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4330 and ASTR 4330 and ASTR 5330

Additional Information: Departmental Category: Graduate Course

GEOL 5420 (3) Quaternary Dating Methods

Features in-depth survey of standard and experimental dating methods that provide absolute ages for events of the last two million years of Earth history. Includes theory and application of radiocarbon, uranium series, amino acid, thermo-luminescence, fission track, potassium/argon, hydration, light stable isotopes, and other radioactive techniques.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5430 (3) Paleoclimatology and Paleogeography

Examines scientific tools, data and theories related to the dramatically varied past climate of Earth. Focus will be on marine records of climate change and ocean circulation, but ice core and continental archives will also be discussed. Covers the Cretaceous Period to the present, with particular emphasis on the past 150,000 years (the last ice age cycle). Department enforced prerequisite: restricted to graduate students only and introductory geology and introductory oceanography or atmospheric science.

Additional Information: Departmental Category: Graduate Course

GEOL 5474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4474 and MUSM 5474

Additional Information: Departmental Category: Graduate Course

GEOL 5550 (3) Petroleum Reservoir Characterization and Modeling

Introduces concepts and methods of petroleum reservoir analysis and 3-D reservoir modeling using subsurface data (cores, well logs, 3-D seismic) and outcrop analogs. Examines petroleum system, petrophysics (lithology, porosity, permeability, capillary pressure, flow units), and sequence-stratigraphic, facies, and structural controls on reservoir properties, heterogeneity and recovery efficiency. Deterministic and stochastic reservoir modeling methods are addressed.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4550

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5670 (3) Isotope Geology

Introduces principles of stable and radiogenic isotope systematics in inorganic and organic geochemistry. Emphasizes application of isotope data to problems in igneous, metamorphic and sedimentary petrology, geobiochemistry, and petroleum genesis.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4670

Additional Information: Departmental Category: Graduate Course

GEOL 5675 (3) Stable Isotopes in Paleoclimate and Paleoecology

Explores the use of stable isotope geochemistry for research questions in paleoclimatology and paleoecology. Covers physical and biological drivers of isotopic fractionation, systematics and applications of light elements such as carbon, nitrogen, oxygen, hydrogen, sulfur and boron and some less traditional isotopic systems. Applications include marine and terrestrial paleoclimate proxies and some uses for ecology and paleoecology.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4675

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 5690 (3) Tectonic History of the Western United States

Provides students with the practical tools needed to make tectonic interpretations through study of the geologic history of the western United States and the geodynamic models used in interpreting that history. Paleomagnetism, geobarometry, geothermometry, geodynamic modeling, and elements of structural geology and stratigraphy are topics considered in this class.

Requisites: Requires prerequisite courses of GEOL 3120 and PHYS 1110 (all minimum grade D-).

Additional Information: Departmental Category: Graduate Course

GEOL 5700 (1-4) Geological Topics Seminar

Offers seminar studies in geological subjects of special current interest. Primarily for graduate students, as departmental staff and facilities permit.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5701 (2) Super-Problems in Quaternary Climate

Investigates major problems in the study and understanding of Quaternary climate variation, in seminar format. Each year one major topic will be addressed, such as: the physics and chemistry of the Ice Age ocean circulation; the theory and mechanics of glacial/interglacial atmospheric CO₂ change; the origins of the 20, 40, and 100 kyr orbital (Milankovitch) climate cycles. Department enforced prerequisites: introduction geology and climatology or oceanography and paleoclimatology or paleoceanography.

Additional Information: Departmental Category: Graduate Course

GEOL 5702 (1) Geomorphology Seminar

Explores the dynamics and forms of the earth's surface through critical reading and discussion of both classical and modern literature.

Repeatable: Repeatable for up to 10.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 5703 (1) Seminar in Tectonics

Focuses on a wide variety of topics related to crust, mantle and whole earth tectonics. Published papers from recent peer-reviewed literature are read and discussed. The format and specific topics will vary each semester (e.g., a relatively focused theme or open format) and will in part be determined by the makeup of enrolled students. Department enforced prerequisite: restricted to graduate students only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 5711 (1-3) Igneous and Metamorphic Field Geology

Applies field techniques to interpretation of igneous and metamorphic rocks. Field exercises and lectures focus on collecting data required to map igneous and metamorphic rock units. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and GEOL 3020.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5712 (1-3) Structural Field Geology

Methods of field study of structure of rocks, including observations, data collection and interpretation to understand geometry of deformation and causative processes and kinematics. Field projects are mapped using different scales, air photos, topographic maps and compass and tape. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and GEOL 3020.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5714 (2) Field Geophysics

Applies geophysical field techniques and data interpretation to studying geological and engineering problems. Fieldwork includes seismic, gravity, magnetic and electrical measurements. Department enforced prerequisite: restricted to graduate students only and GEOL 2001 or GEOL 2700 and MATH 1300 and PHYS 1110.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5715 (1-3) Field Techniques in Surficial Geology and Geohydrology

Introduces various field techniques and data analysis methods in hydrogeologic studies for students in geology, environmental studies, geography and civil engineering. Exercises include mapping ground water levels, conducting slug and pumping tests, measuring steam flows, interpreting aquifer parameters from geophysical measurements and using field data for water budget analysis. Department prerequisite: GEOL 2001 or GEOL 2700.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5716 (1-3) Environmental Field Geochemistry

Develops basic field skills in the most commonly performed tasks required for the environmental characterization of solid and aqueous wastes. Media of study include soils, stream sediments, surface waters, ground waters and atmospheric particulates. Department enforced prerequisites: GEOL 2001 or GEOL 2700 and CHEM 1011 and CHEM 1031 or CHEM 1113 or CHEM 1133 and GEOL 3320.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5717 (1-3) Field Seminar in Geology and Tectonics

Studies geologic features in and around Colorado to gain an overview of the geologic and tectonic evolution of the western U.S. Department enforced prerequisites: restricted to graduate students only and GEOL 2001 or GEOL 2700 and at least one of the following: GEOL 3120 or GEOL 3320 or GEOL 3430.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 5725 (1-4) Field Based Special Topics in Geoscience

Explores selected geological subjects of special interest in a field setting.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4725

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 5800 (3) Planetary Surfaces and Interiors

Examines processes operating on the surfaces of solid planets and in their interiors. Emphasizes spacecraft observations, their interpretation, the relationship to similar processes on Earth, the relationship between planetary surfaces and interiors and the integrated geologic histories of the terrestrial planets and satellites.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5800

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5810 (3) Planetary Atmospheres

Covers the structure, composition, and dynamics of planetary atmospheres. Includes the origin of planetary atmospheres, chemistry and cloud physics, greenhouse effects, climate, and the evolution of planetary atmospheres - past and future.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5810 and ASTR 5810

Additional Information: Departmental Category: Graduate Course

GEOL 5820 (3) Origin and Evolution of Planetary Systems

Considers the origin and evolution of planetary systems, including protoplanetary disks, condensation in the solar nebula, composition of meteorites, planetary accretion, comets, asteroids, planetary rings and extrasolar planets. Applies celestial mechanics to the dynamical evolution of solar system bodies.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5820 and ATOC 5820

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5830 (3) Topics in Planetary Science

Examines current topics in planetary science, based on recent discoveries, spacecraft observations and other developments. Focuses on a specific topic each time the course is offered, such as Mars, Venus, Galilean satellites, exobiology, comets or extrasolar planets. Department enforced prerequisite: restricted to graduate students in the physical sciences.

Equivalent - Duplicate Degree Credit Not Granted: ATOC 5830 and ASTR 5830

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 5835 (1) Seminar in Planetary Science

Studies current research on a topic in planetary science. Students and faculty give presentations. Subjects may vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5835 and ATOC 5835

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5840 (1-3) Independent Study-Quaternary Geology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5841 (1-3) Independent Study-Economic Geology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5842 (1-3) Independent Study-Petrology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5843 (1-3) Independent Study-Sedimentology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5844 (1-3) Independent Study-Structure/Tectonics

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5845 (1-3) Independent Study-Geochemistry

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5846 (1-3) Independent Study-Geophysics

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5847 (1-3) Independent Study-Hydrology

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 5849 (1-3) Independent Study-Paleontology

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 5851 (1-3) Independent Study-Sediment Petrology

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 5852 (1-3) Independent Study--GIS Applications in Quaternary Geosciences

Leads students through quantitative spatial analysis of environmental and paleoclimatic problems. Each student will develop a project from start to finish, with emphasis on raster GIS for building large empirical databases that bear on process and variability.

Additional Information: Departmental Category: Graduate Course

GEOL 6050 (3) Space Instrumentation

Provides an overview of the relevant space environment and process, the types of instruments flown on recent mission and the science background of the measurement principles.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6050 and ASEN 6050

Grading Basis: Letter Grade

Additional Information: Departmental Category: Graduate Course

GEOL 6060 (4) Petroleum Geology of Turbidite Systems

Covers the exploration and production aspects of petroleum submarine fans and turbidite systems.

Requisites: Requires prerequisite course of GEOL 6330 (minimum grade B).

Additional Information: Departmental Category: Graduate Course

GEOL 6310 (3) Sedimentary Petrology

Covers interpretation of depositional and diagenetic history of sedimentary rocks as determined from thin-section studies. Department enforced requisite, restricted to graduate students only. Department enforced prerequisites: GEOL 3010 and GEOL 3020 and GEOL 3430.

Additional Information: Departmental Category: Graduate Course

GEOL 6330 (4) Applied Sequence Stratigraphy and Basin Analysis

Develops skills in the stratigraphic interpretation of seismic reflection data, recognition of sequence stratigraphy in well logs and outcrop and their applications to basin analysis in petroleum exploration.

Department enforced prerequisite: restricted to graduate students only and introductory undergraduate physics and sedimentology/stratigraphy.

Additional Information: Departmental Category: Graduate Course

GEOL 6610 (3) Earth and Planetary Physics 1

Offered alternate years. Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6610 and PHYS 6610

Additional Information: Departmental Category: Graduate Course

GEOL 6620 (3) Earth and Planetary Physics 2

Offered alternate years. Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6620 and PHYS 6620

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Graduate Course

GEOL 6630 (3) Earth and Planetary Physics 3

Offered alternate years. Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6630 and PHYS 6630

Additional Information: Departmental Category: Graduate Course

GEOL 6650 (1-3) Seminar in Geophysics

Advanced seminar studies in geophysical subjects for graduate students.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 6650 and PHYS 6650

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Course

GEOL 6670 (2) Geophysical Inverse Theory

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations. Department enforced prerequisites: a course in calculus and a course in computer programming (any language).

Equivalent - Duplicate Degree Credit Not Granted: PHYS 6670

Additional Information: Departmental Category: Graduate Course

GEOL 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Graduate Course

GEOL 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

GEOL 6960 (3) Plan II Master's Research

Additional Information: Departmental Category: Graduate Course

GEOL 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Graduate Course

German (GRMN)

Courses

GRMN 1010 (4) Beginning German 1

Introduction to language and culture of the German-speaking world, with emphasis on the acquisition of basic communication skills in cultural context. For students with no previous training in German.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1030

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: German

GRMN 1020 (4) Beginning German 2

Continued development of German-language skills and cultural knowledge for effective communication. Emphasis on more complex language structures and sustained interactions. Department enforced prerequisite: GRMN 1010 (min grade of C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1030

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: German

GRMN 1030 (5) Intensive Beginning German

Covers the same material as GRMN 1010 and GRMN 1020 in one course. Focuses on acquiring ability to understand and speak everyday German; on developing reading and writing skills; and on learning about the cultures of the German-speaking countries.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1010 and GRMN 1020

Additional Information: Departmental Category: German

GRMN 1500 (3) German for Reading Knowledge

Designed especially for graduate students. Emphasizes analytical skills for acquiring reading proficiency in specialized and technical German in one's field of research. Recommended for pass/fail registration. Does not satisfy the arts and sciences foreign language requirement. Does not count towards the German major.

Additional Information: Departmental Category: German

GRMN 1601 (3) Germany Today

Introduces the culture of contemporary German-speaking central Europe, examining historical processes, social and political patterns, and the intellectual and artistic responses to problems of the 20th and 21st centuries. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: German Courses Taught in English

GRMN 1602 (3) Metropolis and Modernity

An interdisciplinary introduction to the modern industrial city in Europe and the USA, with particular attention to the representation of urbanism in the visual arts. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 1701 (3) Nature and Environment in German Literature and Thought

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green Party. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 1701

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 2010 (4) Intermediate German 1

Development of skills for independent use of German. Discussions, writing and listening/viewing activities that address topics of the contemporary German-speaking world. Department enforced prerequisite: GRMN 1020 or 1030 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2030

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: German

GRMN 2020 (4) Intermediate German 2

Development of communication skills and knowledge about recent social, cultural and political developments in German speaking countries through texts, media and film. Department enforced prerequisite: GRMN 2010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2030

Additional Information: Departmental Category: German

GRMN 2030 (5) Intensive Intermediate German

Covers the same material as GRMN 2010 and GRMN 2020 in one semester. Offers review and continuation of basic skills begun in the first year: reading, writing, speaking and oral comprehensive. Department enforced prerequisite: GRMN 1020 or GRMN 1030 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2010 and GRMN 2020

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: German

GRMN 2301 (3) Inside Nazi Germany: Politics, Culture, and Everyday Life in the Third Reich

Examines social culture and everyday life in Nazi Germany. Topics include the role of propaganda in the media and entertainment industries, anti-Semitism and suppression of ethnic, social and religious minorities, the role of education and youth organizations, as well as the role of women, the churches, and the effects of a controlled economy before and during World War II. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: German Courses Taught in English

GRMN 2501 (3) Miniatures of Modern Life: Introduction to Short Fiction

Introduces students to short fiction from the 20th century. Focuses on issues and themes of modern life, such as: alienation and anxiety; cultures of spectatorship; gender roles, sexuality and social life; memory and nostalgia; technology, industry and capitalism; state power and revolution. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 2502 (3) Representing the Holocaust

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake? Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2502

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 2503 (3) Fairy Tales of Germany

Explores the origins, cultural significance, stylistic and thematic features of the German fairy tale, with emphasis on the Brothers Grimm; on artistic fairy tales by Goethe, Tieck, Brentano, and others; and, on modern retellings in literature and popular culture. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 2601 (3) Kafka and the Kafkaesque

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 2601

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 2603 (3) Moral Dilemmas in Philosophy and Literature

Examines the moral dilemmas that arise when opportunities afforded by basic freedoms or advances in technology clash with the ethical imperatives that issue from the Enlightenment and the social contract. Guiding questions include: When does the quest for knowledge legitimate transgression of prevailing morality? By what standard do we adjudicate the ambitions of the individual when they compete with the interests of the state? Taught in English.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 3010 (3) Advanced German 1

Focuses on cultural topics and reviews grammatical topics, expands vocabulary and provides practice in reading, writing, listening and conversation skills. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 after GRMN 3010. Department enforced prerequisite: four semesters of college German or equivalent. Open to freshmen with instructor consent.

Additional Information: Departmental Category: German

GRMN 3020 (3) Advanced German 2

Expands and refines skills acquired in GRMN 3010. Improves overall fluency and deepens cultural understanding of the German-speaking countries. Develops an advanced skill level in the areas of listening, speaking, reading and writing. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3020. Department enforced prereq., GRMN 3010 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3030 (3) Business German

Introduces students to the language and culture of German business and economic life. Provides insights into everyday business practices and institutions, including Germany's position in the European and world markets. Improves all language skills with an emphasis on Business German. Familiarizes students with current aspects of German society, professional life and business culture. Students will have the option of taking the internationally recognized exam Goethe-Zertifikat B1 or B2 after GRMN 3030. Department enforced prereq., GRMN 2020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3110 (3) German Literature from the Avant-garde to the Postmodern

Examines selected literary texts. Emphasizes longer unedited texts as well as critical skills. May be taken either before or after GRMN 3120. Department enforced prereq., GRMN 2020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3120 (3) German Literature from the Enlightenment to Expressionism

Examines selected literary texts of various periods. Emphasizes longer texts and critical skills. May be taken either before or after GRMN 3110. Department enforced prereq., GRMN 2020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 3130 (3) Issues in German Philosophy and Literature

Examines selected interdisciplinary texts from the German literary and philosophical tradition. Topics address issues central to philosophical inquiry, and may include knowledge and its limits, mind and body, determinism and free will, reason and religious belief, and ethical problems. Department enforced prereq., GRMN 2020 or 2030 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3140 (3) Current Issues in German Literature

Examines issues pervading contemporary German literature, such as concerns of youth, gender, stereotyping as it affects women and men in their relations with one another, loneliness and sexual frustration, work experiences, and other issues. Department enforced restriction: ability to read unedited German and to speak German.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3150 (3) Issues in German Politics and Literature

Examines literary and theoretical texts in German about the relationship between literature and politics. Topics may include history and revolution, political theater, feminist aesthetics or terrorism. Readings and discussion in German. Department enforced prereq., GRMN 2020 or GRMN 2030 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3501 (3) German-Jewish Writers: From the Enlightenment to the Present

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3501

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: German Courses Taught in English

GRMN 3502 (3) Literature in the Age of Goethe

Features the writings of Germany's major literary figures from 1749 to 1832. Special attention is paid to the formation of literary periods, genres, aesthetic, and socio-historical developments contributing to the birth of modernism in German intellectual history and literature. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 3503 (3) German Film Through World War II

History and theory of Weimar and Nazi film with sociocultural emphasis. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3503

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3504 (3) Topics in German Film

Analyzes key issues in German culture as they are represented in film and other media, e.g., technology, architecture, women and the Holocaust. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3504 FILM 3504

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3505 (3) The Enlightenment: Tolerance and Emancipation

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3505

Additional Information: Arts Sci Core Curr: Ideals and Values

Departmental Category: German Courses Taught in English

GRMN 3506 (3) Tracing the Criminal: Crime in 19th C Society and Culture

Examines cultural and literary representations of crime from the Enlightenment to the early 20th century and contextualizes them within the history of judicial and medical approaches to criminality. Focusing on representations of the criminal as an object of knowledge, this survey of intellectual history introduces students to critical approaches in the humanities and the study of social phenomena in their historical context.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: German Courses Taught in English

GRMN 3513 (3) German Film and Society 1945-1989

Introduces issues in German society through film during the Cold War. Focus on East and West Germany, though some other German language films may be included. Emphasis is on reading films in their social, historical and political contexts. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3513

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3514 (3) German Film & Society After 1989

Introduces post-1989 German culture through film. Emphasizes films in their socio-historical contexts and explores developments in German culture during and after the unification. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3514

Additional Information: Departmental Category: German Courses Taught in English

GRMN 3520 (3) Open Topics in the Cultural Context

Examines topics in the cultures of German-speaking central Europe.

Contact the departmental office for specific course offerings. Department enforced prereq., GRMN 3020 (minimum grade C-)

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 3601 (3) German Women Writers

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form, and feminism. Visual arts, film, and feminist theory will also be considered in their relation to literature. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3601

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: German Courses Taught in English

GRMN 3702 (3) Dada and Surrealist Literature

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3702

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 3802 (3) Politics and Culture in Berlin 1900-1933

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3802

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: German Courses Taught in English

GRMN 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: German

GRMN 3930 (1-6) Internship

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) German Studies (GRMN) majors only.

Additional Information: Departmental Category: German

GRMN 4010 (3) Advanced Grammar and Stylistics

Emphasizes idiomatically correct spoken and written German in a variety of genres and culturally relevant contexts. Offers a comprehensive review of the more complex grammatical problems and syntactic structures of the German language. Grammar exercises alternate with readings, discussions and writing on topics related to current cultural, social and political issues in the German-speaking countries. Students have the option of taking the internationally recognized exam Goethe-Zertifikat B2 after GRMN 4010. Department enforced prereq., GRMN 3020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 4051 (3) Critical Theory of the Frankfurt School

Serves as an introduction to the "Frankfurt School" and Critical Theory with particular emphasis upon rationality, social psychology, cultural criticism, and aesthetics. Through close readings of key texts by members of the school (Horkheimer, Benjamin, Adorno, Habermas) we will work toward a critical understanding of the analytical tools they developed and consider their validity. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 5051

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4231 (3) Sex, Love and Marriage in Literature and Philosophy

Traces notions of love, sex and marriage in 19th-20th century philosophy and literature. Considered will be whether/how these representations reflect or challenge ideas of human agency, dignity and happiness. Examined will be shifting views of gender and other social configurations (e.g., friendship, adultery, same-sex desire) to understand their influence on modern attitudes towards sexuality and fidelity.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 5231

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4251 (3) Marxism

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels. Taught in English. Department enforced prerequisite: 12 hours of GRMN or PHIL course work or instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4250

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4253 (3) Philosophy of Language

Surveys seminal essays from Frege to the present on the philosophy of language. Taught in English.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4301 (3) Gender, Race and Immigration in Germany and Europe

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation, and sexuality. Texts may include film, literature, television, magazine images, etc. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4301 and GRMN 5301

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: German Courses Taught in English

GRMN 4330 (3) The Age of Goethe

German literature from 1770 to 1830. Close examination of representative texts from the periods of Sturm und Drang, classicism, and romanticism. Emphasizes philosophical and social background. Department enforced prereq., GRMN 3020 (minimum grade C-).

Additional Information: Departmental Category: German

GRMN 4340 (3) Seminar in German Literature

Intensive study of a particular literary period, author, or genre. Secondary sources are used. Course content differs each time. Department enforced prereq., GRMN 3020 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German

GRMN 4450 (3) Methods of Teaching German

Required of students who desire the recommendation of the department for secondary school teaching positions. For student teaching in German, see EDUC 4712 under the School of Education.

Requisites: Restricted to School of Education (EDUC) undergraduates only

Additional Information: Departmental Category: German

GRMN 4460 (6) High School German Teaching

Part of the supervised student teaching in a secondary school required for state certification to teach German.

Requisites: Restricted to School of Education (EDUC) undergraduates only

Grading Basis: Pass/Fail

Additional Information: Departmental Category: German

GRMN 4501 (3) Seminar: Literature in Cultural Context

Provides a broader basis for the work of literature, viewing it from various cultural perspectives. Specific content of course is defined by the instructor. Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4502 (3) Nietzsche: Literature and Values

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4502

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: German Courses Taught in English

GRMN 4503 (3) Issues in German Thought

Provides the opportunity to examine major issues in German philosophical, social, and religious thought from the end of German idealism to existentialism and critical theory. Emphasizes the relationship between ideas and social and political action. Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: German Courses Taught in English

GRMN 4504 (3) Goethe's Faust

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 5504 and HUMN 4504

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: German Courses Taught in English

GRMN 4550 (3) Senior Seminar: The Roles of Intellectuals and Academics in German Culture

Examines the articulation of the German bourgeoisie during critical periods in German history. Looks at specific groups and their participation in German public culture, e.g., writers, artists, journalists, academics, and political figures. Students work closely with a faculty advisor during the semester and are expected to produce a major research paper. Department enforced prereq., GRMN 3020 (minimum grade C-).

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) German (GRMN) or School of Education (EDUC) majors only.

Additional Information: Departmental Category: German

GRMN 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: German

GRMN 5010 (3) Theory and Practice of German Studies

Introduction to German Studies, with emphasis on research methodology, theoretical approaches, coverage of major currents in German intellectual and literary history from 1750-present, and exposure to fields interrelated with German Studies. Includes training in the use of electronic databases and archives and an introduction to online publication. Required of all graduate students.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5020 (3) Applied Linguistics and Foreign Language Teaching Methodology

Required of all graduate teaching assistants, this course provides a knowledge of the aspects of German linguistics that are important for teaching German and a survey of foreign language teaching methods and second language acquisition research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5030 (3) Foundations of Critical Theory

An introductory study of nineteenth-century German philosophy (especially Kant, Hegel, and Marx). Required course for the graduate certificate in Critical Theory.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5051 (3) Critical Theory of the Frankfurt School

Serves as an introduction to the "Frankfurt School" and Critical Theory with particular emphasis upon rationality, social psychology, cultural criticism, and aesthetics. Through close readings of key texts by members of the school (Horkheimer, Benjamin, Adorno, Habermas) we will work toward a critical understanding of the analytical tools they developed and consider their validity. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4051

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Courses Taught in English

Departmental Category: German Graduate Courses

GRMN 5210 (3) Seminar: The Age of Enlightenment

Examines the influence of the emerging middle class on the transformation of aesthetic and societal values. Major works of theory, philosophy, literature, and criticism by Lessing, Herder, Kant, J. E. Schlegel, and others. Examines major literary and cultural influences from France and Great Britain.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5220 (3) Seminar: Topics in the Age of Goethe

Examines various aspects of German-speaking society from the 1770s to 1830s. Topics may include Sturm und Drang as social commentary; romantic theory in the wake of the French Revolution; romantic nationalism; the Faust theme; Weimar as a cultural center; and others.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5231 (3) Sex, Love and Marriage in Literature and Philosophy

Traces notions of love, sex and marriage in 19th-20th century philosophy and literature. Considered will be whether/how these representations reflect or challenge ideas of human agency, dignity and happiness. Examined will be shifting views of gender and other social configurations (e.g., friendship, adultery, same-sex desire) to understand their influence on modern attitudes towards sexuality and fidelity.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4231

Additional Information: Departmental Category: German Graduate Courses

GRMN 5301 (3) Gender, Race, and Immigration in Germany and Europe

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation, and sexuality. Texts may include film, literature, television, magazine images, etc. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4301 and WGST 4301

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5310 (3) Seminar: Topics in the 19th Century

Examines the transformation of realism from Buechner to Gerhart Hauptmann. Topics may include literary responses to the Restoration; intellectuals and the Revolution of 1848; philosophy and literature; theatrical representations of woman, family, and gender; and others.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5320 (3) Seminar: The German Novel from 1901--1956

Beginning with T. Mann's *Buddenbrooks*, charts the rise of the German novel in the early 20th century and examines such topics as Wilhelminian society; intellectuals and World War I; dehumanization and alienation; national socialism and literary exile; and others. Authors include T. Mann, H. Hesse, R. Rilke, F. Kafka, A. Seghers, and A. Zweig.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5330 (3) Seminar: German Intellectuals and Society Between the Wars

Examines the period of social crisis and the intellectual responses to the collapse of the prewar order. Gives attention to the antidemocratic thought of Spengler, Juenger, Stefan George and his circle, to the emergence of existentialism with Scheler and Heidegger, and to the search for a new political humanism as evidenced by the work of Thomas Mann.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5410 (3) Seminar: Topics in Early 20th Century German Society

Focuses on major issues, events, movements, and figures prior to World War II. Topics may include the ontology of lyric poetry; Berlin in the 1920s; exiles, their communities, and their writings; women writers from Andreas-Salome to Anna Seghers; topics in German film; and others.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5420 (3) Seminar: Topics in Later 20th Century German Society

Analyzes major currents and events such as the Holocaust, coming to terms with the past (*Vergangenheitsbewältigung*), German Democratic Republic (GDR) literature, and responses to the reunification. Topics may include the Austrians from Anschluss to Haider; Paul Celan; East German writers between Wolf Biermann and Christa Wolf; topics in German film; and others.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5504 (3) Goethe's Faust

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's *Doctor Faustus*. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4504 and HUMN 4504

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5510 (3) Seminar: Open Topics in German Civilization

Focuses on cultural issues that cross lines of literary periodization. Topics may include the theater as social criticism from Lessing to Handke; forms of German protest from Luther to Thomas Mann; nihilism from Bonaventura to Thomas Bernhard; topics in German film; and others.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5520 (3) Seminar: Current Issues in German Literature and Media

Examines issues pervading contemporary German literature and media, such as concerns of youth, xenophobia, stereotyping as it affects women and men in their relations, work experience, feminism, problems connected with the reunification, and other issues.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 5900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 6900 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

GRMN 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: German Graduate Courses

GRMN 7010 (1-3) Writing Colloquium

Prepares students for the qualifying examination paper and dissertation, and equips students with the skills needed to transform seminar papers into publishable work. Includes sessions on dissertation writing, publishing journal articles, preparing a reading list, and conducting archival research. Required for students in the German Studies PhD program. Cannot be satisfied through transfer credit.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to German Studies PhD students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: German

GRMN 7900 (1-6) Independent Study

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: German Graduate Courses

GRMN 7930 (1-6) Internship

Provides an academically supervised opportunity for doctoral students to earn credit while working for public or private organizations.

Students supplement their work experience through directed readings and assignments. Students interested in applying for an internship must complete the Arts & Sciences Internship Application at <http://advising.colorado.edu/sites/default/files/Internshipcredit.pdf>. 1-6 hours;

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to German Studies graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: German Graduate Courses

GRMN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements of the degree. For detailed information regarding doctoral dissertation credit, refer to Graduate School rules.

Repeatable: Repeatable for up to 100.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: German Graduate Courses

Germanic & Slavic Languages & Literatures (GSLL)

Courses

GSLL 2350 (3) Introduction to Jewish Culture

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2350

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Germanic and Slavic Courses

GSLL 2401 (3) The German Experience in North America

Discusses the history, culture and literature of German immigrants from the 17th to the 21st century. Investigates reasons for migration and the Diaspora of Germans in Russia to the United States and Canada. Studies individual settlements and stores of German pioneer authors and introduces course participants to archival research.

Additional Information: Departmental Category: German Courses Taught in English

GSLL 2551 (3) Modern Jewish Literature

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly HEBR 2551.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2551

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Germanic and Slavic Courses

GSLL 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the "Cold War." Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3401

Additional Information: Departmental Category: Germanic and Slavic Courses

GSLL 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3600 and IAFS 3600

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Germanic and Slavic Courses

GSLL 5900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Germanic and Slavic Courses

Global Studies Residential Academic Program (GSAP)

Courses

GSAP 1000 (3) World Politics and Society

Explores the history leading up to-and away from-the attacks of 9/11 within an American framework. Topics to be covered include: America's relationship with key countries since 1945; the rise of Muslim extremism; modern terrorism and its meaning; the importance of oil; and the events of 9/11 and the Bush Administration's response to it, at home and abroad.

Requisites: Restricted to Global Studies Residential Academic Program (PGST) students only.

GSAP 1500 (1) Community Engagement

Facilitates community-level service and volunteer opportunities in the University, Boulder-Denver area, and Colorado communities for first-year students. Participants will learn how to conduct basic community research and will design their own volunteer, service, or internship plan in conjunction with the instructor and the class, targeting a university center, community nonprofit, local business, government agency, or international institution.

GSAP 2010 (3) Introduction to National Security

Introduces national and international security studies to students. The course examines the influence of history, domestic politics, and international events and actors on the development of security policy.

Requisites: Restricted to Global Studies Residential Academic Program (PGST) students only.

Graduate Teacher Education (GRTE)

Courses

GRTE 5010 (0.5-5) Graduate Humanities for Teachers

Addresses special topics in arts and humanities with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Teacher Education

GRTE 5020 (0.5-5) Graduate Mathematics for Teachers

Addresses special topics in mathematics with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Teacher Education

GRTE 5030 (0.5-5) Graduate Natural Sciences for Teachers

Addresses special topics in natural sciences with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Teacher Education

GRTE 5040 (0.5-5) Graduate Social Sciences for Teachers

Addresses special topics in social sciences with an emphasis on building conceptual understanding of content and enhancing teacher's practice in teaching this content.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Graduate Teacher Education

Hebrew (HEBR)

Courses

HEBR 1010 (4) Beginning Modern Hebrew, First Semester

First semester Hebrew is an introductory course designed for students with little or no prior knowledge of Hebrew. Begins with the Hebrew alphabet and develops rudimentary, conversational reading and writing skills. By the end of the semester students are expected to have attained basic understanding and expressive abilities in Hebrew.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Hebrew

HEBR 1020 (4) Beginning Modern Hebrew, Second Semester

Builds on skills introduced in HEBR 1010, focusing on speaking, comprehension, reading and writing. Students learn new verbal tenses and paradigms. Blends communicative method with formal grammatical instruction. By semester's end students will be able to speak, comprehend and write basic Hebrew. Department enforced prerequisite HEBR 1010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: HEBR 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Hebrew

HEBR 1030 (3) Beginning Biblical Hebrew, First Semester

Designed to enable students to read the Hebrew Bible in the original language. Focus is on the ability to read the various genres of the text, utilizing both the tools of modern language acquisition and the study of classical grammar methods.

Additional Information: Departmental Category: Hebrew

HEBR 1040 (3) Beginning Biblical Hebrew, Second Semester

Building on HEBR 1030, continues to build expertise in reading the Hebrew Bible. Modern language acquisition and classical grammar study methods equip students with the tools to translate and read the various genres of the Biblical material.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1040

Requisites: Requires a prerequisite course of HEBR 1030 (minimum grade C-).

Additional Information: Departmental Category: Hebrew

HEBR 1050 (6) Intensive Beginning Modern Hebrew

Covers the same material as HEBR 1010 and 1020 combined in one course. Focuses on acquiring basic ability to understand and speak modern Hebrew. Develops basic reading and writing skills and provides exposure to the fundamentals of Israeli culture.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 1010 or HEBR 1020

Grading Basis: Letter Grade

Additional Information: Departmental Category: Hebrew

HEBR 2030 (3) Intermediate Biblical Hebrew, First Semester

Builds on linguistic skills acquired in first year biblical Hebrew. Develops students' reading comprehension and language production with textual assignments and writing exercises. Advances the study of complex grammatical forms.

Additional Information: Departmental Category: Hebrew

HEBR 2040 (3) Intermediate Biblical Hebrew, Second Semester

Develops and extends grammatical knowledge acquired in the first three semesters of biblical Hebrew. Reading of more comprehensive biblical texts which include readings from the Pentateuch, prophets and writings.

Requisites: Requires prerequisite course of HEBR 2030 or JWST 2030 (minimum grade C-).

Additional Information: Departmental Category: Hebrew

HEBR 2110 (4) Intermediate Modern Hebrew, First Semester

Third semester Hebrew builds on skills introduced in the first two semesters and focuses on speaking, comprehension, reading and writing. Students learn new verbal tenses and paradigms, modes of expression and syntactical forms. The course blends a communicative method with formal grammatical instruction. By the end of the semester students are expected to be able to converse in, comprehend, and produce written Hebrew at an intermediate level. Department enforced prerequisite: HEBR 1020 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Hebrew

HEBR 2120 (4) Intermediate Modern Hebrew, Second Semester

Focuses on texts, while still developing speaking, comprehension and writing skills. Students build on grammatical understanding while learning some of the more sophisticated verbal paradigms and nominal patterns. Blends a communicative method with some formal grammatical instruction. By the end of this semester students are expected to converse in, comprehend and produce written Hebrew at an intermediate level. Department enforced prerequisite: HEBR 2110 (minimum grade C-).

Additional Information: Departmental Category: Hebrew

HEBR 3010 (3) Third Year Modern Hebrew, First Semester

Focuses on students' active Hebrew language skills acquired in the first four semesters of Hebrew at CU-Boulder in weekly conversation and composition sessions. Develops grammatical understanding with a further exploration of the root, verbal and noun systems. Students are introduced to texts in contemporary Hebrew fiction and poetry, as well as some biblical readings. Department enforced prerequisite: HEBR 2120 (minimum grade C-) or instructor consent.

Additional Information: Departmental Category: Hebrew

HEBR 3020 (3) Third Year Modern Hebrew, Second Semester

Focuses on students' Hebrew language skills acquired in the first five semesters of Hebrew at CU-Boulder in weekly conversation and composition sessions. Develops grammatical understanding with a further exploration of the root, verbal and noun systems. Students are introduced to texts in contemporary Hebrew fiction and poetry, as well as some biblical readings, academic texts and Israeli newspapers.

Department enforced prereq., HEBR 3010 (minimum grade C-).

Additional Information: Departmental Category: Hebrew

HEBR 3030 (3) Advanced Biblical Hebrew, Third Year, First Semester

Develops students' understanding of the more complex linguistic challenges of Biblical Hebrew by reading both narrative and poetic biblical texts. We also revise in greater depth forms we have studied in the previous semesters and begin to look at the ways scholars have dealt with Hapax Legamona and other linguistic features that cannot be easily understood.

Additional Information: Departmental Category: Hebrew

HEBR 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3202 and RLST 3202 and WGST 3201

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Hebrew

HEBR 3840 (3) Independent Study

Department enforced prerequisites: HEBR 1010 and HEBR 1020 and HEBR 2110 and HEBR 2120 (all minimum grade C-).

Additional Information: Departmental Category: Hebrew

HEBR 3850 (3) Independent Study

Department enforced prerequisites: HEBR 1010 and HEBR 1020 and HEBR 2110 and HEBR 2120 and HEBR 3840 (all minimum grade C-).

Additional Information: Departmental Category: Hebrew

HEBR 4101 (3) Topics in Hebrew Studies

Explores topics in Hebrew and Jewish literature and cultures. These may include topics such as diasporic literatures, Jewish artists and thinkers, courses on specific authors, figures or communities. Topics change each semester. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4101

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Hebrew

HEBR 4203 (3) Israeli Literature: Exile, Nation, Home

Examines the creation and development of Israeli literature from its pre-State beginnings to the present day, from the writings of immigrants for whom Hebrew was not their mother tongue to a literature written by native Hebrew speakers. Considers texts written by Israeli Jewish and Arab writers and explores how ideas of exile, nation, and home play into the Israeli experience.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4203

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ENGL 4677 or JWST 4677 or GRMN 2502 or JWST 2502 or JWST 2551 or WRTG 3020.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Hebrew

HEBR 4301 (3) Venice: The Cradle of European Jewish Culture

Explores the development of European Jewish culture from the late Middle Ages to the present by focusing on Jewish life in the city of Venice, Italy. Emphasis is on the development of Venetian print culture and emergence of Italy as a center of Jewish publishing in both the religious and secular world. Examines a variety of cultural and historical material including early printings of the Talmud, the creation of Yiddish popular literature, Hebrew rabbinic literature, responses to political turmoil, and the aftermath of the Nazi genocide. Taught in English. Department enforced prerequisite: GSLL 2350 or JWST 2350 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: JWST 4301

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Hebrew

Hindi/Urdu (HIND)

Courses

HIND 1010 (5) Beginning Hindi 1

Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading, and writing skills. This course is proficiency-based. Activities aim to place the student in the context of the native-speaking environment from the very beginning. Students will be provided with opportunities to participate in local South Asian cultural events.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Hindi
Departmental Category: Asia Content

HIND 1011 (3) Introduction to South Asian Civilizations

Survey of traditional and modern world views and experiences of people on the Indian subcontinent through literature and film, beginning with the Ramayana and including medieval tales, modern novels, and feature films. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 1020 (5) Beginning Hindi 2

Continuation of HIND 1010. Provides a thorough introduction to the modern Hindi language, emphasizing speaking, listening, reading and writing skills. Proficiency-based course aims to place the student in the context of the native-speaking environment from the beginning of the course. Provides opportunities to participate in local South Asian cultural activities and events.

Requisites: Requires prerequisite course of HIND 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Hindi
Departmental Category: Asia Content

HIND 2110 (5) Intermediate Hindi 1

Emphasizes speaking, listening, reading and writing skills and culturally appropriate language use.

Requisites: Requires prerequisite course of HIND 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Hindi
Departmental Category: Asia Content

HIND 2120 (5) Intermediate Hindi 2

Continuation of HIND 2110. Enhances students' speaking, listening, reading and writing skills and culturally appropriate language use.

Requisites: Requires prerequisite course of HIND 2110 (minimum grade C).

Additional Information: Departmental Category: Hindi
Departmental Category: Asia Content

HIND 3110 (3) Advanced Hindi 1

Emphasizes speaking, listening and conversational fluently in Hindi, with a focus on cultural appropriate expression and practical knowledge.

Requisites: Requires prerequisite course of HIND 2120 (minimum grade C).

Additional Information: Departmental Category: Hindi
Departmental Category: Asia Content

HIND 3120 (3) Advanced Hindi 2

Continuation of HIND 3110. Emphasizes reading, listening, and speaking fluency in Hindi-Urdu, with a focus on literary, cinematic and cultural themes in modern and contemporary Hindi-Urdu media and culture. Thematic focus of the course may change each semester. An effort will be made to encourage students to put their language skills into literary and cultural context.

Requisites: Requires prerequisite course of HIND 3110 (minimum grade C).

Additional Information: Departmental Category: Hindi
Departmental Category: Asia Content

HIND 3400 (3) Special Topics

Topics in Hindi. No prerequisites.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Hindi
Departmental Category: Asia Content

HIND 3441 (3) Screening India: A History of Bollywood Cinema

Provides a critical overview of one of the world's largest and most beloved film industries, the popular Hindi cinema produced in Bombay (Mumbai) and consumed around the world under the label "Bollywood". Focus on the post-Independence era to the present, with introduction to key films, directors, stars, genres, formal techniques, and themes, as well as critical analyses of these and other topics. Taught in English.

Additional Information: Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 3651 (3) Living Indian Epics: The Ramayana and the Mahabharata in the Modern Political Imagination

Explores the Ramayana and Mahabharata, two fundamental mythological pillars of Indian society, through literature, comic books, film, television, and political rhetoric as a means of examining major issues of religion, gender, popular culture, and social politics in contemporary India. Taught in English.

Additional Information: Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 3661 (3) South Asian Diasporas: Imagining Home Abroad

Examines fundamental questions of home, nation, identity, ethnicity, and foreignness in the context of the enormous South Asian diaspora. By means of literature, ethnography, and film, the various connotations of diaspora will be explored along with the cultural productions of members of the South Asian diaspora (both Indian and Pakistani). Taught in English.

Additional Information: Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 3811 (3) The Power of the Word: Subversive and Censored 20th Century Indo-Pakistani Literature

Provides an overview of a selection of writings by important 20th century Indo-Pakistani authors, which will permit students to get acquainted with Indian literature. Provides insight into the experience of social and political events in the 20th century and the reaction of the government to the critical analysis and portrayal of these events. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 3831 (3) The Many Faces of Krishna in South Asia Literature and Culture

Using both textual and visual sources, the multiple facets of Krishna in Indian religious experience will be explored through poetry and prose, painting and sculpture, music, dance, and drama. Taught in English.

Additional Information: Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 3851 (3) Devotional Literature in South Asia

Focuses on the medieval and modern periods (1200-present), and the languages of North India and Pakistan (Hindi, Urdu, Panjabi). Students engage with English translations of works by Tulsidas, Surdas, Kabir, Mirabai, Nanak, Khusrau, Ghalib, Anis and Iqbal. Recurring themes include issues of authorship and interpretation; religious and aesthetic encounter; and the legacy of these traditions in modern South Asian society and literature. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Hindi Courses in English
Departmental Category: Asia Content

HIND 4900 (1-3) Independent Study

Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Hindi

History (HIST)

Courses

HIST 1011 (3) Greeks, Romans, Kings & Crusaders: European History to 1600

Examines the history and formation of Europe from its roots in the ancient Near East to Greece to the creation of Medieval states and kingdoms. Topics may include the rise of Christianity, Barbarian migrations, religious persecution, the role of gender and minority status, the growth of trade and European encounters, the Black Death, the European Renaissance the Protestant Reformation.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context
Departmental Category: Europe: Ancient and Medieval
MAPS Course: Social Sci World Context
MAPS Course: Social Science

HIST 1012 (3) Empire, Revolution and Global War: European History Since 1600

Examines the history of modern Europe from 1600. Topics may include religious conflict, absolutions, the Scientific Revolution, the global impact of European colonialism and imperialism, the Enlightenment, the French and Industrial Revolutions, and the emergence of romanticism, nationalism, liberalism, socialism and modernism. Concludes by analyzing World War I and II, communist and fascist totalitarianisms, decolonization and the Cold War. Formerly HIST 1020

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context
Departmental Category: Europe: Modern
MAPS Course: Social Sci World Context
MAPS Course: Social Science

HIST 1015 (3) American History to 1865

Examines American history from pre-Columbian times to the Civil War, including ancient cultures, exploration, colonization, Native American responses, the rise of race slavery, the American Revolution, political developments, Anglo-American expansion, slave life and culture, the market revolution, industrialization, reform and disunion. Introduces students to history as a dynamic discipline that shapes our understanding of the past and present. S. history.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: United States Context
Departmental Category: United States: Chronological Periods
MAPS Course: Social Science
MAPS Course: Social Science US Context

HIST 1018 (3) Introduction to Early Latin American History to 1810

Introduces students to the history of what is now called Latin America from about 1450 to the wars of independence in the nineteenth century. Examines pertinent aspects of the societies and cultures of indigenous people, the history of European conquest, and the most salient features of the Spanish and Portuguese colonial empires in America.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions

HIST 1025 (3) American History since 1865

Explores political, social and cultural changes in American life since Reconstruction. Focuses on shifting social and political relations as the U.S. changed from a nation of farmers and small-town dwellers to an urban, industrial society; the changing meaning of American identity in a society divided by ethnicity, race and class; and the emergence of the U.S. as a world power.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Departmental Category: United States: Chronological Periods

MAPS Course: Social Science

MAPS Course: Social Science US Context

HIST 1028 (3) Introduction to Modern Latin American History since 1800

Introduces students to the history of Latin America from independence to the present. Investigates the social implications of various models of economic development, the opportunities and difficulties resulting from economic ties with wealthier countries, the consequences of ethnic, gender and class divisions, and the struggles of Latin Americans to construct equitable political systems.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1051 (3) The World of the Ancient Greeks

Surveys the emergence, major accomplishments, failures and decline of the world of the ancient Greeks, from Bronze Age civilizations of the Minoans and Mycenaeans through the Hellenistic Age (2000-30 B.C.)

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1051

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Ancient and Medieval

HIST 1061 (3) The Rise and Fall of Ancient Rome

Surveys the rise of ancient Rome in the eighth century B.C. to its fall in the fifth century A.D. Emphasizes political institutions, foreign policy, leading personalities, and unique cultural accomplishments.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1061

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Ancient and Medieval

HIST 1113 (3) Introduction to British History to 1660

Deals with Roman, medieval and early modern periods. Covers the demographic, economic, social patterns, political and religious developments, and cultural changes that contributed to the formation of the English nation.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Specific Countries

HIST 1123 (3) Introduction to British History Since 1660

Deals with the period from the 17th century to the present. Political, economic, social and imperial developments that contributed to creation of the modern industrial and democratic state are the major issues covered.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Europe: Specific Countries

HIST 1218 (3) Introduction to Sub-Saharan African History to 1800

Provides an introduction to African history, beginning with early man and ending in 1800. Moves rapidly through civilizations as different as Ancient Egypt, Mali, Oyo and the Cape Colony, touching on important developments and highlighting themes relevant to the history of Africa as a whole. Including migration, technology, environment, trade, gender, religion, slavery and more.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1228 (3) Introduction to Sub-Saharan African History Since 1800

Introduces students to the history of Sub-Saharan Africa from 1800 to the present. Major topics of study included the trans-Atlantic slave trade, African state-building, European colonialism, African responses to colonialism and issues facing independent African nations, ranging from debt to HIV/AIDS.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

HIST 1308 (3) Introduction to Middle Eastern History

Interdisciplinary course that focuses on medieval and modern history of the Middle East (A.D. 600 to the present). Introduces the Islamic civilization of the Middle East and the historical evolution of the region from the traditional into the modern eras. Covers social patterns, economic life, and intellectual trends, as well as political development.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1438 (3) Introduction to Korean History

Surveys the history of Korea from the ancient period to the early twenty-first century. Topics will include: transnational political and cultural origins of Korea, transformation of gender relations, and effects of wars and colonial experience. Special attention given to the transnational character of historical developments in Korea, as well as historical debates involving neighboring countries in East Asia.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1518 (3) Introduction to South Asian History to 1757

Introduces the history of South Asia, providing a general acquaintance with the narratives and interpretations of ancient and medieval history of the Indian subcontinent from the rise of the Indus Valley Civilization in 3500 BCE to the end of the Mughal Empire in 1757 CE. Intended for students with little or no prior knowledge of the region.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1528 (3) Introduction to South Asian History since 1757

Introduces the history of modern South Asia from 1757 to the present. Examines themes such as the nature of British colonial state formation in South Asia, social transformation under British rule, modes of anticolonial resistance movements, particularly Mahatma Gandhi's nonviolent civil disobedience movement, Muslim nationalism and the formation of Pakistan, and current political conflicts involving India, Pakistan and Afghanistan.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 1618 (3) Introduction to Chinese History to 1644

Introduces students to the history of China from Neolithic period to Ming period (1368-1644). Investigates the social patterns, gender relations, economic structure, intellectual trends, and political developments of China. Pays special attention to China's long-standing interaction with the rest of the world, which played a crucial role in the historical development of Chinese society.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 1626 (3) Introduction to Central and East European History since 1770

Examines major themes and events in the history of East-Central Europe from the late 1700s to the present. Themes include the impacts of nationalism, fascism, liberal democracy and communism in shaping the history of the region. Topics include World War I, World War II and the Holocaust, the Cold War, the fall of Communism, the Ukrainian revolution and more.

Equivalent - Duplicate Degree Credit Not Granted: CEES 1626
Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Europe: Specific Countries

HIST 1628 (3) Introduction to Chinese History since 1644

Introduces students to modern Chinese history and culture, from the 17th century to the present. Considers the pertinent aspects of modern China, focusing on its social patterns, economic structure, intellectual trends and political developments.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 1708 (3) Introduction to Japanese History

A broad interdisciplinary survey of the history of Japan from earliest times to the 20th century. Explores the development of political institutions, social structures, cultural and religious life, economic development, and foreign relations in an historical perspective.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 1800 (3) Introduction to Global History

Applies a broad perspective to the global past in order to illuminate how common historical patterns and processes as well as unique elements shaped the human experience. Using a thematic approach, introduces highlights cross-cultural interactions among societies, and, when relevant, how historical processes that began centuries ago still impact the contemporary world. Topic will vary by semester. Department enforced prerequisite: 3 hours of any history coursework.

Requisites: Restricted to students with 27-180 credits (Sophomore, Junior, or Senior) History (HIST) majors and minors only.
Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 1818 (3) Introduction to Jewish History: Bible to 1492

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1818 and RLST 1818

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 1828 (3) Introduction to Jewish History since 1492

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and anti-semitism.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1828 and RLST 1828

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context
Departmental Category: World Areas: Specific Regions

HIST 1830 (3) Global History of Holocaust and Genocide

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1830 and RLST 1830

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Methodological, Comparative, and Global

HIST 2015 (3) Themes in Early American History

Examines major themes in the development of colonial societies in North America from the 15th to the early 19th centuries. Explores intercultural relations, economic development, labor systems, religion and society, and family life. Specific course focus may vary.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: United States Context
Departmental Category: United States: Chronological Periods

HIST 2100 (3) Revolution in History

Examines the causes, character, and significance of political revolution in world history. Concentrating on one of the major revolutions of modern history, it examines why revolutions occur, who participates in revolution, and to what effect. Specific course focus varies.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Methodological, Comparative, and Global

HIST 2110 (3) History of Early Modern Societies

Examines major themes in Early Modern history in a variety of global contexts. Issues to be explored could include intellectual developments, religion, popular culture, social history, economic and political changes, and states and warfare, usually in a specific region or nation (i.e. Europe, Latin America, the Atlantic World, Spain, Russia, China, Japan, etc.). Topics vary in any given semester.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Methodological, Comparative, and Global

HIST 2126 (3) Issues in Modern U.S. Politics and Foreign Relations

Traces the historical development of modern U.S. politics and foreign relations. Analyzes subjects such as the Cold War, the Vietnam War, the War on Terror, and the relationship between foreign and domestic politics, and the developing meaning of political conservatism, liberalism, and radicalism in the U.S. Explains the impact of race, gender, class, and immigration. Topics vary in any given semester.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

HIST 2166 (3) The Vietnam Wars

Traces the causes, course, and outcome of the wars in Vietnam from 1940 until 1975. Explains the successes of the revolutionaries and the failures of the French and Americans. Analyzes the development of Vietnamese nationalism, French colonialism, and U.S. intervention.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4166

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

Departmental Category: Asia Content

HIST 2170 (3) History of Christianity 1: To the Reformation

General introduction to the history of Christianity from its beginnings through the first period of the Protestant Reformation. Examines religious life and the church in relation to its social and cultural setting.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Methodological, Comparative, and Global

HIST 2220 (3) History of War and Society

Focuses on war and society in a variety of global contexts. Explores the character, origins, and social, political, and intellectual impacts of war in contexts ranging from several centuries of international conflict to the experience of individual nations in specific wars. Topic varies in any given semester; contact Department of History for details.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Historical Context

Departmental Category: Methodological, Comparative, and Global

HIST 2326 (3) Issues in the History of U.S. Society and Culture

Examines the origins, development, and impacts (social, political, cultural, economic, etc.) of significant issues and themes in the cultural, intellectual, and/or social history of the United States from independence to the present day. Explains the impact of race, gender, ethnicity, and class on these issues. Topics vary in any given semester.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

HIST 2437 (3) African American History

Surveys African American history. Studies, interprets and analyzes major problems, issues and trends affecting African Americans from about 1600 to the present.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2432

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 2

HIST 2516 (3) America Through Baseball

Baseball could not have existed without America. Explains how the game fit into the larger context of social, cultural, economic and political history from the 19th century to the present. Studies the events and people who made baseball the national pastime.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4556

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: United States: Topical Courses 1

HIST 2616 (3) History of Gender in America

Introduces the social and cultural construction of femininity and masculinity in America from 1500 to the present. Explores gender as a status acquired and performed through tasks, clothing, adornment and bodily movement. Examines gender ideals, expression and practices such as gender crossing, gender bending and gender plan.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: Human Diversity

Departmental Category: United States: Topical Courses 1

HIST 2629 (3) China in World History

Examines the multiple connections between Chinese history and other parts of the world over the course of China's long history. Specific course focus may vary by instructor/term.

Requisites: History (HIST) majors are restricted from taking this course.

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 3012 (3) Seminar in Modern European History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Modern

HIST 3018 (3) Seminar in Latin American History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 3020 (3) Historical Thinking & Writing

Develops the research techniques and habits of mind required to succeed in the History major, honing students' critical, analytical, and synthetic skills while introducing them to History as a discipline and a way of understanding the world. Students practice the kinds of writing required in upper-division History classes. Topics will vary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prereq courses of HIST 1800 and ARSC 1080 or 1150 or CLAS 1020 or ENGL 1001 or PHIL 1500 or WRTG 1100 or 1150 or 1250 (all min grade C-). Restricted to students with 27-180 credits (Soph, Jr, or Sr) History (HIST) majors only.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Methodological, Comparative, and Global

HIST 3109 (3) Seminar in Asian History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 3110 (3) Honors Seminar

Practical historiography for students who wish to write a senior honors thesis. Emphasizes choice of topic, critical methods, research, organization, argumentation, and writing.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Arts Sciences Honors Course
Departmental Category: Methodological, Comparative, and Global

HIST 3112 (3) Seminar in Renaissance and Reformation

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Modern

HIST 3113 (3) Seminar in Medieval and Early Modern English History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 3115 (3) Seminar in Early American History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 3116 (3) Seminar in American Diplomatic History

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 3120 (3) Honors Thesis

Department enforced prerequisite: HIST 3110 and instructor consent.

Additional Information: Arts Sciences Honors Course
Departmental Category: Methodological, Comparative, and Global

HIST 3133 (3) Seminar in Britain since 1688

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 3212 (3) Seminar in Early Modern Europe

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: Europe: Modern

HIST 3218 (3) Seminar in African History

Deals with the history and anthropology of selected west African societies in the period before the imposition of European colonial rule.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 3317 (3) Seminar in the American West

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 3328 (3) Seminar in Middle Eastern History

Examines selected issues in modern Middle Eastern history. Check with the department concerning the specific subject of the seminar.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).

Recommended: History GPA of 2.0 or higher.

Grading Basis: Letter Grade

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 3414 (3) Seminar in Modern European Thought and Culture**Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Topical**HIST 3415 (3) Seminar in Recent American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Chronological Periods**HIST 3416 (3) Seminar in American Society and Thought****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 3417 (3) Seminar in African American History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 2**HIST 3511 (3) Seminar in Medieval History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 3516 (3) American Culture and Reform, 1880--1920**

Addresses the issues of reform, religion, and culture that emerged as a 19th century world view confronted a 20th century America.

Requisites: Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 3616 (3) Seminar in U.S. Women's History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: United States: Topical Courses 1**HIST 3628 (3) Seminar in Recent Chinese History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content**HIST 3713 (3) Seminar in Russian History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Europe: Specific Countries**HIST 3718 (3) Seminar in Japanese History****Repeatable:** Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content**HIST 3800 (3) Seminar in Global History**

Organized around themes that change year to year, this seminar allows students to explore and research processes, phenomena, and events of global significance in historical context. Stress will be upon subjects that span multiple world areas. Possible topics include: the international arms trade; slavery; health and disease; youth culture; women's rights; genocide. See department for current theme.

Repeatable: Repeatable for up to 6.00 total credit hours.**Requisites:** Requires prerequisite course HIST 3020 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) History (HIST) majors (excludes minors).**Recommended:** History GPA of 2.0 or higher.**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 3840 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Methodological, Comparative, and Global**HIST 3841 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Ancient and Medieval**HIST 3842 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Modern**HIST 3843 (1-3) Independent Study****Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Additional Information:** Departmental Category: Europe: Specific Countries

HIST 3844 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Europe: Topical

HIST 3845 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: United States: Chronological Periods

HIST 3846 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 3847 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 3848 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 3849 (1-3) Independent Study

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 4013 (3) Law and Society in Premodern England to 1688

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5013

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4018 (3) Aztecs, Incas, and the Spanish Conquest of the Americas

Building upon contemporary texts and modern histories of both famous and ordinary people, this course examines the indigenous empires known as the Aztecs and the Incas. It also examines the encounter of Europeans and native people, following the history of exploration and conquest from the time of Columbus to about 1550. Equal consideration is given to the course's three components: Aztec, Inca and the Spanish conquest.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1018 or HIST 3020.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4020 (3) Topics in Comparative History

Explores historical themes from a comparative perspective. Encourages students to think more analytically about historical change. Consult current online schedule for specific topics. Often team-taught by more than one faculty.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite two 4000-level History courses in differing content areas.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4021 (3) Athens and Greek Democracy

Studies Greek history from 800 B.C. (the rise of the city-state) to 323 B.C. (the death of Alexander the Great). Emphasizes the development of democracy in Athens. Readings are in the primary sources.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4021 and CLAS 5021

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4031 (3) Alexander the Great and the Rise of Macedonia

Covers Macedonia's rise to dominance in Greece under Philip II and the reign and conquests of Alexander the Great.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4031 and CLAS 5031

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1509 or CLAS 2039 or CLAS 4139 or CLAS 4149 or CLAS 2041 or CLAS 4021 or CLAS 4041 or HIST 1051 or GREK 3113.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4040 (3) The History of Space Exploration and Defense

This course examines the development and impact of American, Soviet/Russian, and European civilian and military space activities from the dawn of the space age to the space challenges of the 21st century.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4041 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4041 and CLAS 5041 and PHIL 4210

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1061 or HIST 1011 or HIST 1051 or HIST 1061 or PSCI 2004 or PHIL 3000.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4048 (3) Latin American Revolutions

Examines the origins, development and continuing influence of 20th-Century Latin American revolutionary movements, with a focus on placing these struggles in comparative historical context. Explores various approaches to revolution and the general role of left political formations in Latin America. Specific focus can vary by semester with examples drawn from various Latin American countries, including Mexico, Guatemala, Cuba, Chile and Nicaragua.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5048

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1018 or HIST 1028 or HIST 3020.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4050 (3) A Global History of World War II

Examines World War II in a global perspective. This era witnessed transformations in the social, political and economic orders across the globe. Traces the domestic and international developments, including military issues, that shaped the period in Europe, Asia, Africa and North America and assesses the war's legacy.

Requisites: Requires prerequisite course of HIST 1012 or 1025 or 1028 or 1123 or 1228 or 1308 or 1528 or 1628 or 1708 or 1800 or 1828 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global
Departmental Category: Asia Content

HIST 4053 (3) Britain and the Empire, 1688-1964

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5053

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the east as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5061 and CLAS 4061 and CLAS 5061

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4071 (3) Seminar in Ancient Social History

Considers topics ranging from demography, disease, family structure, and the organization of daily life to ancient slavery, economics, and law. Focuses either on Persia, Greece, or Rome and includes a particular emphasis on the methodology required to reconstruct an ancient society, especially the interpretation of problematic literary and material evidence, and the selective use of comparisons with better known societies. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4071 and CLAS 5071

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4081 (3) The Roman Republic

Studies the Roman Republic from its foundation in 753 B.C. to its conclusion with the career of Augustus. Emphasizes the development of Roman Republic government. Readings are in the primary sources. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4081 and CLAS 5081

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4083 (3) Revolution and Nationalism in Modern Ireland

Surveys Irish nationalist movements since the eighteenth century, treating constitutional nationalism, revolutionary republicanism and Gaelic cultural movements while also examining the development of Unionism in Ulster as a response to political and cultural nationalism. Emphasizes the political, religious and cultural roots of the current sectarian crisis in Northern Ireland and analyzes that crisis up to the present day.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1123.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4091 (3) The Roman Empire

Studies Imperial Roman history beginning with the Roman Revolution and ending with examination of the passing of centralized political authority in the western Mediterranean. Emphasizes life, letters and personalities of the Empire.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4091 and CLAS 5091

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4109 (3) World War II in Asia and the Pacific

For Asia, World War II began with the Mukden Incident (1931), resulting in the Japanese domination of Manchuria and leading to a full-scale war between China and Japan in 1937. Only after the Japanese attacked the U.S. Pacific fleet at Pearl Harbor four years later did the United States enter the war. Discusses the various socioeconomic and political factors leading to the war in Asia, examines the nature of the conflict on the Asian mainland and in the Pacific, and assesses legacy of the war on all those involved.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 4116 (3) History of U.S. Foreign Relations, 1865-1940

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5116

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4117 (3) Colorado History

Presents the story of the people, society, culture, and environment of Colorado from the earliest Native Americans, through the Spanish influx, the fur traders and mountain men, the gold rush, railroad builders, the cattlemen and farmers, the silver boom, the twentieth-century tourists, city-dwellers, workers and activists. Highlights the historical origins of twenty-first century institutions, problems, challenges, and opportunities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4118 (3) History of Mexico to 1821

Studies Mexican history beginning with roots and evolution of pre-Columbian civilizations and concluding with the events of Mexican independence in 1821. Emphasizes society and culture of the Aztecs and Mayans, the Spanish conquest of Mexico, and the colonial regime of New Spain.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4122 (3) Europe During the Renaissance

Explores the history and culture of Western Europe, 1300-1520. Comprehensive in scope, with analysis of political, economic, social, religious, intellectual and artistic matters. Discusses significance of the Renaissance for origins of modern civilization.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011.

Additional Information: Departmental Category: Europe: Modern

HIST 4123 (3) Medieval England

Treats the major developments in English history from the Anglo-Saxon period through the 15th century. Emphasizes late medieval English society during the 13th and 14th centuries.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4125 (3) Early American History to 1763

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5125

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4126 (3) History of U.S. Foreign Relations Since 1941

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5126

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4128 (3) The History of Modern Mexico Since 1821

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5128

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1028 or HIST 3020.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4131 (3) The Origins of Christianity

Surveys the sources for the development of ancient Christianity from the ministry of Jesus Christ to the conversion of the emperor Constantine in the early 4th century. Through lectures and a close reading of primary source materials in translation, students will examine the social activity and theological development of early Christians in their Roman and Jewish context.

Requisites: Requires prerequisite course of HIST 1011 or HIST 1061 or HIST 2170 or CLAS 1061 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4133 (3) The Tudors: British History 1485-1603

Deals with the history of England from 1485 to 1603. Examines patterns of daily life, the impact of the Reformation and the Renaissance and the development of Parliament and the monarchy under the Tudor rulers, especially Henry VIII and Elizabeth.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4143 (3) The Making of Great Britain: British History 1603-1714

Covers the history of the British Isles from 1603 to 1714, the era of the English Civil War and the Glorious Revolution. Traces economic and social relationships, cultural change and religious and political conflict under the Stuart monarchs.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1012 or HIST 1113 or HIST 1123.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4146 (3) U.S. Military History since 1898

Examines America's national defense and war efforts from the Spanish American War to the present, emphasizing causes and consequences of modern conflicts, and the impact of military activities on American society.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4153 (3) Emergence of Modern Britain, 1688-1851

Surveys British history from the Revolution of 1688 to the Great Exhibition in 1851. Topics include creation of the United Kingdom, traditional popular culture, birth of a consumer society, the British Enlightenment, the Evangelical Revival, loss of the American colonies, imperial expansion in Asia, war with Revolutionary and Napoleonic France, the Industrial Revolution, and the impact of utilitarianism and political radicalism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1113 or HIST 1123.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4158 (3) History of Modern Brazil

Surveys the post independence history of 19th and 20th century Brazil. Looks at the development of Brazilian nationalism and political institutions and focuses heavily on race, ethnicity, gender and sexuality in Brazil, understanding how different peoples have settled and accommodated themselves to the Brazilian environment. Finally, it will look at Brazilian economic development and its consequences at the beginning of the 21st century.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4166 (3) The Vietnam War in Politics and Culture

Examines America's second-longest and most divisive war from the beginning of the U.S. involvement in the 1950s to the repercussions echoing into the 1980s. Considers the global context, motives, and evolution of U.S. involvement, support for and opposition to the war at home, the war's repercussions in international policy and domestic politics, and representations of the war in popular culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 2166

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

Departmental Category: Asia Content

HIST 4190 (3) French Connections: Contemporary France and America in Historical Context

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3500

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Methodological, Comparative, and Global

HIST 4205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

Equivalent - Duplicate Degree Credit Not Granted: HIST 5205

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4212 (3) The Age of Religious Wars: Reformation Europe, 1500-1648

Traces the history of Europe from the end of the Hundred Years War through the Thirty Years War. During this period Europe experienced tremendous changes including emerging religious heresies, the advent of the Spanish Inquisition, violent civil wars, the witch craze, and the Thirty Years War, a precursor to the World Wars of the 20th century.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Additional Information: Departmental Category: Europe: Modern

HIST 4215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5215

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4217 (3) The American West in the 19th Century

Explores cultural, social and political interaction in the American West during the 19th century. Themes include environmental change; conflict and syncretism across race, class, and gender lines; mythic images, and their relationship to the "Real" West.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4218 (3) Lost Kingdoms & Caliphates: West Africa to 1900

Investigates the formation and dissolution of West Africa's kingdoms, caliphates and stateless societies during the era of the trans-Atlantic and trans-Saharan slave trades. Through a survey of oral and written sources, this course examines West Africa's geopolitical transformation in warfare, jihad, trade and slavery, especially in relation to the African Diaspora to the Americas and Muslim world.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4222 (3) War and the European State, 1618-1793

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

Equivalent - Duplicate Degree Credit Not Granted: HIST 5222

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Modern

HIST 4223 (3) The French Revolution and Napoleon

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades of revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5223

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4227 (3) The American West in the 20th Century

Explores cultural, social, and political interaction in the American West during the 20th century. Themes include popular culture, state-federal relationships, environmental change, urbanization, immigration, and cultural formation.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4232 (3) From Absolutism to Revolution in Europe, 1648-1789

Studies the history of Europe from the end of the Thirty Years War through the outbreak of the French Revolution. Central themes include the establishment of more centralized, increasingly bureaucratic states; global expansion and economic commercialization; cultural developments such as the Scientific Revolution and the Enlightenment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1123.

Additional Information: Departmental Category: Europe: Modern

HIST 4233 (3) History of France since 1815

Examines the ongoing struggle between the revolutionary and counter-revolutionary traditions of France and how it shaped the political history and affected the social, cultural and intellectual character of the nation from 1815 to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4235 (3) Jacksonian America

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5235

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4238 (3) History of Southern Africa

Examines the history of southern Africa history from the earliest times to the present. Short background readings and lectures cover southern African's history and class discussions of novels are layered over these basics. Topics of study include Cecil Rhodes and the diamond/gold mines; Shaka and the Zulu "nation"; apartheid; Nelson Mandela and the anti-apartheid movement; issues facing South Africa today.

Requisites: Requires prerequisite course of HIST 1218 or HIST 1228 or HIST 3020 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4258 (3) Africa under European Colonial Rule

Looks at the British, French, Portuguese and German empires that undertook the "Scramble for Africa" in the late 19th century. Themes include slavery and the slave trade; colonization and "pacification"; African resistance to European rule; missionaries and converts; decolonization and anti-colonial uprisings; issues facing Africa today, including oil, war and the Rwandan genocide.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1218 or HIST 1228 or HIST 3020 or ANTH 1150 or ANTH 3100 or ANTH 4630 or GEOG 3862 or PSCI 3082.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4303 (3) Venice and Florence during the Renaissance

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5303

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4312 (3) 19th Century Europe

Concerned with major social, political and cultural developments in Europe from circa 1800 to the outbreak of World War I. Special emphasis is placed upon the Napoleonic experience, the rise of modern nationalism, romanticism, Darwinism and its social applications, the Industrial Revolution, imperialism, the emergence of modern ideologies, and the background of World War I.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4313 (3) History of Modern Italy

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4250

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4315 (3) Civil War and Reconstruction

Describes the forces at work in the antebellum period that led to sectional warfare; social, economic, and political changes effected by the war; the American agony of reconstruction; and the long-range results of that difficult era.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4320 (3) The History of the Mediterranean, 1000-1600

Familiarizes students with the Mediterranean ecumene covering concepts such as the Renaissance, the Crusades, traders and travelers, religions and cities. Explores both conflicts (military, confessional) and exchanges (commercial, artistic, scientific) thus helping students think cross culturally, comparatively and thematically. Emphasizes the Mediterranean contribution to historical developments of western Europe, the Middle East, and North Africa.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1061 or HIST 1308 or HIST 4061 or HIST 4071 or HIST 4081 or HIST 4091 or HIST 4711.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4326 (3) Epidemic Disease in US History

Focuses on the impact of infectious epidemic disease on American history, from smallpox and cholera to influenza, AIDS and Ebola. Addresses early depopulation of the Americas; contagion and social upheaval; interpretations of pestilence; social construction of disease; urbanization; doctors and alternative practitioners; public health; prejudice and infection; the ethics of quarantine; public versus individual interests; and the paradox of prevention.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4328 (3) The Modern Middle East, 1600 to the Present

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5328

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1308.

Additional Information: Departmental Category: World Areas: Specific Regions
Departmental Category: Asia Content

HIST 4329 (3) Islam in the Modern World: Revivalism, Modernism, and Fundamentalism, 1800-2001

Examines the more important movements of reform in Muslim world (including Africa, the Middle East and India) from the 18th century to the present, and their origins and intellectual import. Due to the trans-regional nature of this broad movement of reform, particular attention is paid to how these movements related to local political, economic and social contexts, and how they, in turn, moved across larger networks of oceanic commerce and trade. Concludes with extended case studies of Islamic reformism in modern Egypt and India, and their ultimate influence on the politics of contemporary Islamist movements, especially the intellectual position of Ussama B. Ladin.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1308.

Additional Information: Departmental Category: World Areas: Comparable and General
Departmental Category: Asia Content

HIST 4336 (3) Nineteenth-Century American Thought and Culture

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the early republic to the beginning of the modern era. Addresses developing arguments about democracy, religion, transcendentalism, gender, race, union/disunion, the Darwinian revolution, utopia/dystopia realism and naturalism in literature and the arts.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4338 (3) History of Modern Israel/Palestine

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4338

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4339 (3) Borderlands of the British Empire

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5339

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012 or HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 4343 (3) Spain and Portugal during the Golden Age

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 4064.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5343

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1018.

Additional Information: Departmental Category: Europe: Topical

HIST 4346 (3) Twentieth-Century American Thought and Culture

Examines the emergence of intellectual traditions and cultural trends in their social and political contexts from the beginning of the modern era through the onset of the postmodern. Addresses developing arguments about democracy, science, race, gender, faith, American identity, radicalism and conservatism, modernist thinking and artistic expression, and the role of intellectuals in society.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4348 (3) Topics in Jewish History

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4348

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4349 (3) Decolonization of the British Empire

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5349

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1123 or HIST 1228 or HIST 1308 or HIST 1528 or HIST 4053 or HIST 4238 or HIST 4258 or HIST 4328 or HIST 4329 or HIST 4338 or HIST 4339 or HIST 4538 or HIST 4548 or HIST 4558.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 4366 (3) Culture Wars: Modernism, Mass Culture, and the Modern U.S.

Examines how U.S. public moralists, intellectuals, and artists from the end of the nineteenth century to World War II both celebrated and attacked the rise of two characteristic features of modernity: mass culture (amusement parks, popular music, radio, movies), and modernist literary and artistic expression. Addresses how Americans both constructed and violated the line between "popular" and "high" culture.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4378 (3) History of Modern Jewish-Muslim Relations

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4378

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4412 (3) Europe, 1890-1945

Examines the origins, character and significance of the First and Second World Wars for the major nations of Europe during the first half of the 20th century.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4414 (3) European Thought and Culture, 1750-1870

Explores major developments in European thought from the Enlightenment to Nietzsche. Special attention given to the individuals whose ideas have had the greatest influence on modern intellectual history, e.g., Rousseau, Hegel, Herder, Marx, Kierkegaard, Baudelaire, Darwin, and others.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4415 (3) Teddy Roosevelt's America - the U.S. from 1877 to 1917

Examines the social, economic, political, and cultural history of the United States from the end of Reconstruction to the eve of World War I. Topics include the struggles of labor and industry, race and immigration, western and environmental issues, city life and new technologies, feminism and Progressivism, and Indian wars and imperialism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025 or ENVS 1000.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4416 (3) Environmental History of North America

Examines how people of North America, from precolonial times to the present, interact with, altered, and thought about the natural world. Key themes include Native American land uses; colonization and ecological imperialism; environmental impacts of food and agriculture; industrialization, urbanization and pollution; energy transitions; cultures of environmental appreciation; the growth of the conservation and environmental movements.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4422 (3) World War I in Europe

Examines the origins of World War I; the military, social and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the 20th century world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5422

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4423 (3) German History Since 1849

Cultural, political and social history of Germany since 1849.

Emphasizes German unification, Bismarckian foreign policy, the rise of neoromanticism, Weimar politics and the rise of national socialism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4424 (3) Modern European Thought and Culture, 1870-Present

Emphasizes Nietzsche and the youth revolt against middle class society, the literary and artistic avant garde (impressionism to existentialism), the psychoanalytic movement, the European right and left, and post-WWII European thought.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4425 (3) United States History, 1917-1945

Examines U.S. history from World War I through World War II. Key themes include: warfare; the rise of the modern state; consumer culture; the shift from conservative politics to the New Deal liberalism; the women's movement; immigration restriction; segregation; the Great Migration, and civil rights; conflicts between secular modernism and religious fundamentalism; and new technologies such as the automobile.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4433 (3) Nazi Germany

Focuses on the political, social, cultural, and psychological roots of national socialism, with the nature of the national socialist regime, and those politics and actions that came directly out of its challenge to values central to Western civilization. Studies how Nazism came out of this civilization.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4435 (3) United States History, 1945-1973

Examines the History of the United States during the Cold War, with an emphasis on social and cultural issues at home. Also addresses the economic and political evolution of the American people and the nation's role in world affairs.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4437 (3) African American History, 1619--1865

Explores the history of Africans in America from the first arrivals to emancipation, and their role in the social, cultural, economic, and political evolution of the United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4442 (3) Europe since 1945

Explores Europe from the end of World War II through the present day. Topics include postwar reconstruction; the cold war; anticommunist opposition and new social movements; consumer culture and punk music; the fall of communism; the Yugoslav wars; European unity.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Modern

HIST 4444 (3) Topics in Modern European Thought

Explores a selected theme in European thought since the Enlightenment. Topics vary each term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4445 (3) United States History since 1973

Traces political, diplomatic, economic, and social developments in the United States from 1973 to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 4454 (3) Jewish Intellectual History

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4454

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Topical

HIST 4511 (3) Europe in the Dark Ages (400-1000 A.D.)

Examines the history of Europe from the fall of the Roman Empire to the turn of the first millennium. Treats social, political and religious transformations in the barbarian kingdoms, and considers the persistence of Roman institutions and culture and the impact of Christianity in northern Europe.

Requisites: Requires prerequisite course of HIST 1011 or HIST 2170 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4516 (3) U.S. Society in the 19th Century

Concerned with the American family and community in the changing social environments of the 19th century. Examines families of different ethnic and class backgrounds, observing how they are changed by new economic conditions, reform, or new political institutions.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4521 (3) Europe in the High Middle Ages (1000-1400 A.D.)

Examines the history of Europe from the emergence of feudal institutions to the rise of nation states, with specific attention to social, intellectual and religious change, the role of law and ritual, the crusades and European expansion, and urban growth and identity in the West.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 2170.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4526 (3) Immigrants, Workers and the 1 percent - Recent U.S. Social History

In the 21st century we see a widely divided U.S. society, with a privileged "one percent" on one end, and a striking pattern of poverty on the other. How did the U.S. get this way? This course shows students how to explore social change through the people of the 20th century, their experiences, and the words they left behind.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4527 (3) Mexican-American History since 1848

Examines Mexican-origins people in the United States from the 19th century through the present. Focuses on Mexican-American history as both an integral part of American history and as a unique subject of historical investigation. Using primary and secondary sources, students will examine how Mexicans and Mexican-Americans have negotiated, influenced, and responded to political, social, cultural, and economic circumstances in the U.S.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4528 (3) Islam in South and Southeast Asia (1000 to the Present)

Examines the history of Muslim societies in South and Southeast Asia from 1000 to the present. Focuses on themes such as the rise of Islamic empires in South Asia, Sufism, trade and the spread of Islam in Southeast Asia, the rise or Muslim nationalism and religious fundamentalism, and the impact of modernization and globalization on Muslims of the region.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Requisite 6 hours of any history coursework.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4534 (3) Modern European Jewish History

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4534

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Europe: Topical

HIST 4538 (3) History of Modern India

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5538

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite 6 hours of any history coursework.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4544 (3) History of Yiddish Culture

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5544 and JWST 4544

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HEBR 2350 or JWST 2350.

Additional Information: Departmental Category: Europe: Topical

HIST 4546 (3) Popular Culture in the Modern United States

Traces the history of cultural expression in the United States since the late nineteenth century. From art, fiction, and music to the movies, amusement parks, shopping, and sports, popular culture offers clues to decipher shifting patterns of consumption, globalization, race, gender, politics, technology, and media. Includes instruction and practice interpreting cultural materials in historical context.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1025 or ATLS 2000.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4548 (3) Women in Modern India

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5548

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1528.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4556 (3) The History of America through Baseball

Baseball serves as a window to view the American experience. Covers U.S. history since 1830, addressing the major topics that reflect on American society, such as professionalization, labor management conflict, race, gender, culture, politics, economics and diplomacy.

Equivalent - Duplicate Degree Credit Not Granted: HIST 2516

Requisites: Requires prerequisite course of HIST 1025 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4558 (3) Buddha to Gandhi: A History of Indian Nonviolence

Focuses on the intellectual history of nonviolence in India from the time of the Buddha to Mahatma Gandhi who led India to national independence from the British Empire in 1947. Pursues this history in light of the encounter between Indian and western cultural traditions in modern India.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4616 (3) History of Gender and Sexuality in the United States to 1870

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities a served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5616 and WGST 4616

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4617 (3) Native North American History I: Human Settlement to 1815

Explores the establishment and development of human societies in North America prior to 1492; the varied experiences of contact; the crises, opportunities, and transformations that attended colonialism; Indians and the inter-imperial contests of the eighteenth century; and the struggles of native peoples confronting the newly-independent United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4618 (3) Early Modern China, 960-1842

Examines political, social, and cultural history of China from the Song Dynasty (960-1279) to the opium War (1839-1842). Topics covered include the development of imperial political institution and gentry society, Conquest Dynasties, Neo-Confucianism, China's "medieval economic revolution", Chinese world order in East Asia, Qing multiethnic empire, Chinese overseas migration, and the coming of the West.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4619 (3) Women in East Asian History

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4619 and HIST 5619

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 4620 (3) A Global History of Sexuality: The Modern Era

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4620

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4623 (3) History of Eastern Europe Since 1914

Examines the struggle of nations of eastern Europe to assert their independence, from break-up of the imperial system at the end of World War I, through the Soviet bloc that emerged after World War II, to the establishment of democratic governments after the 1989 revolutions.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4626 (3) History of Gender and Sexuality in the United States from 1870

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4626

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4627 (3) Native North American History II: 1815 to Present

Explores the longevity and continuity of human history in North America by discussing pre-European social and cultural developments. By examining ways in which Indian societies west of the Mississippi River responded to Euro-Americans, the Indians' role in western North American history is demonstrated.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics as Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5628

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the United States through investigation of lesbian/gay identity formation, community development, politics, and queer cultural resistance.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5636 and WGST 4636

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1025 or LGBT 2000.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4638 (3) Contemporary China: Radicalism and Reform, 1949 to Present

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5638

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4640 (3) Women, Gender and War

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4640

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1015 or HIST 1012 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4643 (3) Poland since the 16th Century: Democracy and Nation

Traces themes of democracy and nationalism in Polish history from the "Noble Republic" of the early modern era through the struggles with fascism and communism in the 20th century, to Poland's current position on the eastern edge of Western Europe.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4648 (3) Inventing Chinese Modernity, 1800 to Present

Examines the long and painful transformation, during the modern period of native Chinese concepts about the meaning of life, the proper order of politics and society, the role of the individual, the nature and role of human emotions, the place of the gods, the definition of nation, the proper relations between the sexes, and China's place in the global order.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4658 (3) China and Islam from the 7th Century to the 20th Century

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5658

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1618 or HIST 1628 or CHIN 1012.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4688 (3) Window on Modern China

Examines the relationship between China's recent history and its booming contemporary economy and society through on-location study in a Chinese city. The course makes use of a rich array of historical and other kinds of sites to teach students to think critically about themes and events that played a shaping role in the unfolding of modern Chinese history.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4711 (3) The Medieval Crusades: Holy War and Its History, 1095-1400

Studies the innovation, impact and meaning of holy war and the expansion of Christendom during the High Middle Ages. Topics include the definition of crusade and crusaders, religious persecution and tolerance, the expansion of European modes of government, war memory, colonization and its aftermath, the meaning of the Holy Land and the home front.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 2170.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4713 (3) History of Russia through the 17th Century

Introduces the history and culture of Russia from the 9th to the 17th century. Emphasizes selected topics in social, economic, religious and cultural history, including the formation of the Russian state conversion to Orthodox Christianity, the Mongol invasion and the reign of Ivan the Terrible.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4718 (3) Ancient, Classical, and Medieval Japanese History

Begins with the prehistoric and protohistoric periods. Explores the development of Japan's classical age and traces the rise and attenuation of an elite warrior government.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4723 (3) Imperial Russia

Surveys major cultural, social, and economic changes from the reign of Peter the Great through World War I.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4726 (3) A Nation of Immigrants: Immigration in American History

Examines the shifting kaleidoscope of immigration to the United States in the 19th and 20th centuries. Considers immigrant motives, cultures and experiences; changing cultural and political ideas about the value of immigration; the relationship of immigration and immigration policy to ideas about the American national project; the creation and consequences of immigration law.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 4728 (3) Modern Japanese History

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5728

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4733 (3) The Russian Revolution and the Soviet Regime

Covers in detail the significant social, economic and political events of Soviet Russia from the February Revolution of 1917 to the present.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4738 (3) History of Early Modern Japan (1590-1868)

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

Equivalent - Duplicate Degree Credit Not Granted: HIST 5738

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 4758 (3) The History of Postwar Japan, 1945 to Present

Explores political, economic, social and cultural factors in postwar Japan. Although the defeat in 1945 is often seen as "zero hour", a moment of near total disjunction, the outlines of postwar Japan emerged during World War II. Beginning with the 1930s, traces growth and development, social change, globalization, the quest for collective identity and other themes in the evolving Japanese nation-state.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5761 and CLAS 4761 and CLAS 5761

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 4800 (3) Special Topics in Global History

Organized around themes that change yearly, this class allows students to study and research processes, phenomena, and events of global significance in historical context. Will stress historical subjects that span multiple geographic regions of the globe. Topics could include the global history of: the arms trade; slavery; health and disease; youth culture; women's rights; genocide, the environment, migration, economic trade, warfare exploration etc...

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4803 (3) Special Topics in European History

Covers specialized topics in European history, usually focusing on a specific country or theme.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite HIST 1011 or HIST 1012.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 4808 (3) Special Topics in World Areas History

Covers specialized topics in the history of World Areas outside of Europe and/or North America, usually focusing on one country or region.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 4820 (3) Human Rights: Historical Perspectives

Examines the history of modern ideas of human rights. Focuses on themes such as the universalism/cultural relativism debate, colonialism, nationalism, refugees and stateless peoples, the United Nations and humanitarianism, ethnic genocide in Rwanda, and human rights abuses by the Taliban regime in Afghanistan.

Requisites: Requires a prerequisite of 6 hours of credit in any History course. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 4827 (3) Modern U.S. Jewish History since 1880

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4827

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 4930 (1-6) History Internship

Matches selected students with supervised internships in professional archives research libraries, historical associations, and special projects. Interns apply their academic area specialty to their work in the field. Internships have a work and academic (reading and writing) component. **Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) History (HIST) majors and minors only.

Recommended: Prerequisite completion of lower-level history coursework (for example HIST 1015 or HIST 1025).

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 5000 (3) Historical Methods: Introduction to the Professional Study of History

Introduces purposes, materials, and techniques of historical scholarship. Theory, practice, and criticism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 5012 (3) Graduate Colloquium in European History

Acquaints students with key works in the literature of European history, and addresses matters of method and interpretation. Department enforced requisite: admission to the graduate program in history.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5013 (3) Law and Society in Premodern England to 1688

Examines the origins and developments of English legal and political institutions, including kingship, the common law, procedure and the court and jury system and sets such developments in the context of broader social and religious changes from the Anglo-Saxon period to the 17th century. Emphasizes the implications of these institutions for the development of contemporary American, English and British colonial legal systems.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4013

Requisites: Restricted to graduate students only.

Recommended: Prerequisite HIST 1011 or HIST 1113.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5048 (3) Latin American Revolutions

Examines the origins, development and continuing influence of 20th century Latin American revolutionary movements, with a focus on placing these struggles in comparative historical context. Explores various approaches to revolution and the general role of left political formations in Latin America. Specific focus can vary by semester with examples drawn from various Latin American countries, including Mexico, Guatemala, Cuba, Chile and Nicaragua.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4048

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5053 (3) Britain and the Empire, 1688-1964

Examines the external polity of Great Britain from 1688 to 1964 in Europe, the East, Africa and the Americas.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4053

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5061 (3) Twilight of Antiquity

Explores the reasons for the fall of the Roman Empire in the western Mediterranean and its survival in the East as Byzantium. Emphasizes Christianity; barbarians; social, economic and cultural differences; contemporary views of Rome; and modern scholarship. No Greek or Latin is required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4061 and CLAS 4061 and CLAS 5061

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 5106 (3) Graduate Colloquium in United States History

Students gain an acquaintance with major works in the field and discuss current issues of interpretation and methodology.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5116 (3) History of U.S. Foreign Relations, 1865-1940

Traces the rise of the United States to world power. Explores the interactions of expansionist and isolationist impulses with politics, ideology, culture and economics, with a focus on the Spanish American War and the acquisition of empire, World War I and the coming of World War II. Instructor's permission required for non-history graduate students.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4116

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5125 (3) Early American History to 1763

Explores the colonial era of American history from the pre-Columbian period to the end of the Seven Years' War. Topics include pre-contact Native societies, exploration, European settlement and Native American responses, labor system and the rise of slavery, imperial wars, and the developments in religion, society, politics and culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4125

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5126 (3) History of U.S. Foreign Relations Since 1941

Traces the development of the United States as a superpower. Details American power and diplomacy in World War II and the rise of the national security state in the Cold War. Explores the Korean, Vietnam and Persian Gulf Wars, and the era of modern-day globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4126

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5128 (3) The History of Modern Mexico Since 1821

Centers on the Mexican search for political consolidation and stability through the 19th, 20th and 21st centuries. Focuses on the Mexican Revolution (1910-1940) and the post revolutionary rule of the Institutional Revolutionary Party. Examines the War on Drugs and the causes of Mexican migration to the United States.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4128

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5129 (3) Colloquium in Modern Asian History

Introduces major topics and themes in Asian history. Analyzes readings relating to topics such as imperialism, cultural agency, gender, race, nationalism, decolonization, and revolution.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 5205 (3) The Colonial Wars and the Coming of American Independence, 1739-1776

Investigates imperial warfare and its effects during the late colonial period, concentrating on the French and Indian War (1754-1763), the disruption of Anglo-American relations and the origins of the War of American Independence (1775-1783).

Equivalent - Duplicate Degree Credit Not Granted: HIST 4205

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5215 (3) The Revolutionary War and the Making of the American Republic, 1775-1801

Investigates the Revolutionary War and its impact on the creation of American political institutions, as well as its cultural, social and economic effects, from the Battles of Lexington and Concord through the inauguration of Thomas Jefferson.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4215

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5222 (3) War and the European State, 1618-1793

Studies the development of the European states in response to international power struggles in the 17th and 18th centuries (up to the French Revolution).

Equivalent - Duplicate Degree Credit Not Granted: HIST 4222

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5223 (3) The French Revolution and Napoleon

Traces the origins, course, and consequences of the most important modern revolution, the French Revolution of 1789. While seeking to explain how a liberal movement for progressive change soon degenerated into the factional bloodbath of the Terror, will also examine the revolution's global impact and how three decades or revolutionary warfare lead to the rise and fall of Napoleon Bonaparte.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4223

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5235 (3) Jacksonian America

Focuses on the social and cultural history of the Jacksonian Era. Issues include the transformation of the market economy, slavery, moral reform, Indian removal, changes in ideas about men's and women's natures and roles, western expansion, and political culture.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4235

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5248 (3) History of Anglo-American Criminal Justice

Explores the social, cultural, and legal history of Anglo-American criminal justice from the 17th to the 20th centuries. Also examines tensions between various methods that historians employ to study crime and law.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5303 (3) Venice and Florence during the Renaissance

Comparative urban study of Florence and Venice from 13th through 16th centuries. Principal subjects are the distinctive economies of the cities, political developments, Renaissance humanism, patronage of the arts, and foreign policy.

Equivalent - Duplicate Degree Credit Not Granted: HIST 5303

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5328 (3) The Modern Middle East, 1600 to the Present

Primarily from 1800 to the present. Attention divided equally between the region's political history and international relations and its patterns of economic, social and cultural modernization in the main countries.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4328

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5339 (3) Borderlands of the British Empire

Examines the development of the borderlands of the British empire through imperial expansion, consolidation, and early decolonization. Focuses on the 19th and early 20th centuries. Topics include domination, resistance and negotiation in areas such as India, Afghanistan, the Palestine Mandate. Aims for students to acquire skills in comparative history and to develop a better understanding of the roots of contemporary conflicts.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4339

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 5343 (3) Spain and Portugal during the Golden Age

Surveys the history of Spain and Portugal from the late medieval period through early modern period. Explores the thought, art, politics and socio-economic milieu of the Golden Age. Topics include attitudes toward minorities, the Inquisition, the Age of Exploration and the establishment of colonial empires in Asia and the Americas, court culture and architecture, religious conflicts and literary production. Formerly HIST 5064.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4343

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 5349 (3) Decolonization of the British Empire

Examines the end of the British Empire. Focuses on connections between imperial territories, such as networks of anticolonial activists and links between British decision makers. Students will acquire research skills and develop a better understanding of the roots of contemporary conflict. Prior coursework in British imperial history and excellent writing skills are required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4349

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 5422 (3) World War I in Europe

Examines the origins of World War I; the military, social, and cultural character of the conflict; and its enduring impact in the post-1918 world. By thinking about the war as both a military undertaking and an experience that affected domestic and global politics, the course will explore why World War I constituted an event of major importance to Europe and the twentieth-century world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4422

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5538 (3) History of Modern India

Examines the history of India from the British conquest of India in the late 18th century to independence in 1947. Emphasizes the impact of British rule on the political, economic and social development of modern India.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4538

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 hours of any history coursework.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5544 (3) History of Yiddish Culture

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4544 and JWST 4544

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Europe: Topical

HIST 5548 (3) Women in Modern India

Examines the history of women and gender in India from the late 18th century to the present. Explores topics such as the changing legal status of women in the colonial and postcolonial period, marriage, domesticity and patriarchy, and women's education and participation in anti-colonial and postcolonial politics, women, work and the environment, violence against women, and women and globalization.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4548

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5616 (3) History of Gender and Sexuality in the United States to 1870

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4616 and WGST 4616

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5619 (3) Women in East Asian History

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state, and cultural systems. Topic varies in any given semester.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4619 and WGST 4619

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 5628 (3) Modern China: Collapse of Imperial Brilliance, 1644-1949

Examines the brilliance of the Qing dynasty, its collapse in 1911, and the bloody and chaotic several decades that followed, up to the 1949 Communist Revolution. Focuses on such topics as Qing imperialism in Central Asia, global capitalism and Western imperialism in China, the opium trade, domestic violence, nationalism, concepts of modernity, competing revolutionary movements, and WW II in Asia.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4628

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5636 (3) Lesbian and Gay History: Culture, Politics, and Social Change in the United States

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics, and queer cultural resistance.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4636 and WGST 4636

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5638 (3) Contemporary China: Radicalism and Reform, 1949 to Present

Examines the dramatic, often tragic, and globally transformative history of China under the Chinese Communist Party. Focuses on such topics as political, social, and cultural revolution, nationalism, Maoism, the Great Leap Forward, Red Guards and the Great Proletarian Cultural Revolution, the Deng Xiaoping era, relations with Taiwan, the 1989 Tiananmen Massacre, and China's rise as a world power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4638

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5658 (3) China and Islam from the 7th Century to the 20th Century

Traces how "Muslims in China" transformed themselves into "Chinese Muslims" while at once accommodating and conflicting with Chinese states and people throughout history until the present time.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4658

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5728 (3) Modern Japanese History

Begins with early modern Japan, proceeds through the era of rapid modernization after the Meiji Restoration in the mid-19th century, and concludes with Japan's gradual descent into prolonged war, first with China and then in the Pacific.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4728

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5738 (3) History of Early Modern Japan (1590-1868)

Covers the history of early modern Japan (1590-1868). Explores the political, social, cultural and economic context of Japan's history from the era of Warring States through the rise and fall of the Tokugawa military government (Shogunate).

Equivalent - Duplicate Degree Credit Not Granted: HIST 4738

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 5761 (3) Roman Law

Studies the constitutional and legal history of ancient Rome; emphasizes basic legal concepts and comparisons with American law. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4761 and CLAS 4761 and CLAS 5761

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 5840 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 5841 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 5842 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 5843 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 5844 (1-3) Independent Study-Europe/Topical

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 5845 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 5846 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 5847 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 5848 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 5849 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 6012 (3) Readings in Modern European History

Requisites: Restricted to History (HIST) graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 6019 (3) Readings in World History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 6020 (3) Modern Empires: Readings in Imperial History

Introduces major topics and themes in imperial history. Reviews central theories of modern colonial empire, ranging from economic and political motivations for expansion, to the cultural and social impact of empire, to post-colonialism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6028 (3) Readings in Modern Latin American History

Examines major themes and topics in the social, political and economic history of Latin America. Possible topics include nationalism and state-building, neocolonialism, revolution and reaction, race, and gender.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite HIST 5128.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 6030 (3) Readings: Frontiers and Borderlands in the Americas

Introduces classic and recent scholarship on frontiers and borderlands in the Americas. Chronological focus will vary by semester, from contact through twentieth century. A hemispheric approach encourages comparative insights about topics such as colonialism and ecological change, war and violence, indigenous resistance, acculturation, ethnogenesis, and evolving ideas about race, gender, and identity at the margins of empires and nation-states.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6109 (3) Readings in Asian History

Explores a specific theme in Asian History in depth. Topic may vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 6113 (3) Readings in English History to 1714

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 6115 (3) Readings in American Colonial History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 6116 (3) Readings in American Diplomatic History

Requisites: Restricted to graduate students only.

Recommended: Requisite undergraduate work in American history.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6123 (3) Readings in English History Since 1688

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 6150 (3) Critical and Theoretical Issues in Museums

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 6150 and ARTH 6150 and ANTH 6150

Requisites: Requires prerequisite course of MUSM 5011 (minimum grade D-).

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6212 (3) Readings in 17th Century Europe

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 6317 (3) Readings in the American West

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 6326 (3) Readings in United States Intellectual History

Examines the history of ideas and the social history of intellectuals in American society during the 19th and 20th centuries. Stresses social and political dimensions and the changing cultural and institutional contexts of intellectual discourse.

Requisites: Restricted to History (HIST) graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6329 (3) Readings in Comparative Ethnohistory

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 6330 (3) History of Sex and Sexuality

Examines major historical trends in the study of meanings and practices of sex and sexuality. Focuses on emergence and negotiation of sexual matters in circumstances where sex and identity were not coterminous.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6349 (3) Decolonization in Transnational Perspective: The End of the British Empire in S Asia & Middle East

Examines Britain's withdrawal from South Asia and the Palestine mandate. Topics include collaboration, anticolonial resistance, Indian and Palestinian nationalisms, zionism, transcolonial connections, counter insurgency, and partition.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 6410 (3) Readings in Environmental History

Offers historical perspective on the complex and interdependent relationship between human social and cultural institutions and the natural world. Considers interdisciplinary methodologies incorporating history, biology, geography, law, and other disciplines. Formerly HIST 6417.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6413 (3) Readings in Modern German History

Requisites: Restricted to graduate students only.

Recommended: Requisite general background in European history.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 6414 (3) Readings in European Intellectual History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 6420 (3) Memory and History in Transnational Perspective

Engages in debates about historical methods and how the past is represented. Central topics will include memory and the forces of nationalism and war; commemoration and monuments; the role of memory in the construction of race and ethnicity; personal past and cultural remembrance; and the relationships between academic, public, and popular histories.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6427 (3) Readings in African American History

Introduces classic and recent scholarship, and critical issues in African American history, from slavery to the present.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 6511 (3) Readings in Medieval History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 6526 (3) Readings in U.S. Social History, 1880--1940

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6528 (3) Reading in South Asian History

Introduces major topics and themes in South Asian history. Reviews central theories relating to topics such as religion, nationalism, law, gender, colonialism, and literature.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

Departmental Category: Asia Content

HIST 6546 (3) Readings in Cultural History and Theory

Introduces standard works and recent developments in cultural history. Explores structuralism and post-structuralism, semiotics, social construction, relativism, hegemony, and the idea of postmodernity in the uses of culture as an historical category.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6610 (3) Readings in Gender History

Examines the field of gender history that includes an understanding of women's and/or men's experience as lived and socially or culturally constructed. Regional or national focus and time period to be determined by the faculty member teaching the course in any given semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6616 (3) Readings in the History of American Women

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6756 (3) Race and Nationalism

Focuses on analytical, ideological, cultural, and political tensions between understandings of race and nationalism. Readings are interdisciplinary, but students identify and analyze tensions between race and nationalism at particular historical moments.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 6800 (3) Readings in Global History

Explores various topics, regions, and methods in history and historical writing by utilizing a global/thematic approach. Geared toward graduate students in History, but students from other disciplines with graduate standing may enroll with instructor consent. Topic and content of course will vary depending on instructor.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 6950 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 7052 (3) Seminar: Modern European History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 7110 (3) Research Seminar in Atlantic History 1500-1800

Discusses the concepts and methods that inform the field of Atlantic history in the early modern era. Readings and research papers explore the interactions of peoples from Europe, Africa, and the Americas, including the exchange of ideas, peoples, commodities, and cultural practices.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 7119 (3) Graduate Research Seminar in Asian History

Prepares students for research in historical documents in Asian languages in order to write a substantial original research paper based on primary and secondary source materials.

Requisites: Restricted to graduate students only.

Recommended: Requisite background in Asian history.

Additional Information: Departmental Category: World Areas: Comparable and General

Departmental Category: Asia Content

HIST 7153 (3) Seminar: English History, 800--1688

Requisites: Restricted to graduate students only.

Recommended: Requisite background in English or European history.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 7155 (3) Seminar: Early American History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 7156 (3) Seminar: American Diplomatic History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 7252 (3) Seminar: Early Modern Europe, 16th to 18th Centuries

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 7257 (3) Seminar: History of the American Frontier

Requisites: Restricted to History (HIST) graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 7326 (3) Seminar: U.S. Intellectual History

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 7415 (3) Graduate Seminar in Modern United States History

Introduces students to various research approaches and methods in modern U.S. historiography and requires them to produce a substantial and original research paper using both primary and secondary sources.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 7424 (3) Research Methods in Medieval/Early Modern European History

Introduces students to research skills needed to work with historical manuscripts. Students learn to read late medieval/early modern handwriting, explore CU's microfilmed collections of manuscripts, and write a research paper based on the manuscript materials.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 7485 (3) Seminar: United States History, 1948–Present

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 7556 (3) Seminar: American Society and Thought

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 7581 (3) Latin Paleography

Discusses the development of formal scripts from the late Roman Empire to the 15th century. Provides practice in identification, transliteration, and translation of medieval manuscripts.

Requisites: Restricted to graduate students only.

Recommended: Requisite reading knowledge of Latin.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 7840 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Methodological, Comparative, and Global

HIST 7841 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Ancient and Medieval

HIST 7842 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Modern

HIST 7843 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Specific Countries

HIST 7844 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Europe: Topical

HIST 7845 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Chronological Periods

HIST 7846 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 1

HIST 7847 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: United States: Topical Courses 2

HIST 7848 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Specific Regions

HIST 7849 (1-3) Independent Study

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: World Areas: Comparable and General

HIST 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Methodological, Comparative, and Global

Honors (HONR)

Courses

HONR 1001 (1) Honors Coseminar

Honors coseminars are designed to combine an honors seminar experience with the shared experience of an organized lecture course. Designed typically for 15 students, coseminars are taken for an additional 1 credit hour. Coseminars provide honors students with an opportunity to extend their common experience in the course lecture into an enriched interactive, critical thinking opportunity.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

Additional Information: Arts Sciences Honors Course

HONR 1810 (3) Honors Diversity Seminar

Students will develop an appreciation for, and experience with, diverse perspectives. In particular this includes: racial/ethnic, gender, sexual orientation, and class perspectives, for constructing knowledge as they proceed through their undergraduate studies. Three themes provide the framework for the course: education for the next century, the 21st century citizen, and the modern individual in a diverse society. Topics explored include privilege, stigmatization, targeted and nontargeted grouping, and oppression. Engaging in independent research and experiential, empathetic experiences is required.

Requisites: Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Human Diversity

HONR 2250 (3) Ethics of Ambition

Through selected readings in classical literature on ethics and through more contemporary readings and films, examines critical ethical issues relating to the competition of ambitions and the alternative styles of choosing between courses of action in a dangerous world. Uses biographies of those whose lives illustrate both the complexities of the struggles and the profundity of possibilities. Considers the unconscious metaphors of national visions and ambitions, the competing ethics of ends and means, the conflicting ambitions in a pluralistic society, and the transcendent ambitions of visionaries.

Equivalent - Duplicate Degree Credit Not Granted: FARR 2660

Requisites: Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Ideals and Values

HONR 2251 (3) Introduction to the Bible

Studies the major works, figures, and genres of the Bible and attempts to understand what they meant to their own time and why they became so important to Western civilization and contemporary America.

Requisites: Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Historical Context

HONR 2500 (3) Open Topics

Variety of new courses at the 2000 level. See honors program announcements for specific contents.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

Additional Information: Arts Sciences Honors Course

HONR 2860 (3) The Figure of Socrates

Investigates why Socrates intrigued great writers like Aristophanes, Plato, Xenophon, and Aristotle and why, through his life and execution by the Athenian democracy, he still influences Western ethics, politics, and education and is central to cultural literacy.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Literature and the Arts

HONR 3004 (3) Women in Education

Honors women in education and their legacy. Introduces women educators, beginning in the late 19th century, whose significant theories of education and work in teaching have had an impact on all of our lives, in history and in society. Explores the educational theories and methods of several representative women educators and analyzes them through an investigation of their professional and personal lives.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3004

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Human Diversity

HONR 3220 (3) Advanced Honors Writing Workshop

Intensive practice of expository writing skills, particularly argumentation in longer forms. Course includes extensive practice in researching secondary sources, synthesizing large bodies of information, structuring cogent arguments for diverse sources, etc.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Written Communication

HONR 3270 (3) Journey Motif in Women's Literature

Investigates the application of the theme of the journey to developmental narratives by analyzing modern British and American writings by women. Applies methods from psychology, feminist studies, gay studies, cultural studies to concepts of development, regression, progress, escape.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Human Diversity

HONR 3550 (1-6) Open Topics

Investigates special topics in humanities, social sciences, and natural sciences. Topics vary from semester to semester and from course to course. See Honors program announcements for specific contents. Open to Honors-qualified students beyond the freshman year. May be repeated for up to six credit hours for different topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sciences Honors Course

HONR 3810 (3) Privilege and Modern Social Construction

Examines social constructions that lead to productive interactions between and among American social communities. Using case studies and humanistic accounts, students analyze the lived experiences of a unique group or successful citizens who routinely evidence productive practices of multicultural engagement. Through interactions with policy makers and community practitioners, students design and enact activities that allow them to reconstruct their personal patterns of privilege practices of their peer groups in various settings.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sciences Honors Course

HONR 4000 (3) Open Topics

Variety of new courses at the 4000 level, see Honors Program announcements for specific contents.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course

HONR 4025 (3) Heroines and Heroic Tradition

Given recent controversies about the roles of women in power, this course re-evaluates heroic traditions as the stories that ground our sense of public endeavor. What do we mean by heroic? What is a heroine? Are heroines different from heroes?

Requisites: Enrollment allowed for first-year students invited into the Honors Program for the current academic year (not including Honors RAP students) and continuing students with a minimum cumulative GPA of 3.300.

Additional Information: Arts Sciences Honors Course
Arts Sci Core Curr: Human Diversity

HONR 4055 (3) Discourse Analysis and Cultural Criticism

Discourse analysis critically investigates the founding assumptions by which systems of meaning operate. Its practice is aimed at a rigorous, systematic analysis of both specific cultural issues and the dynamics by which structures of meaning may be maintained or transformed.

Requisites: Requires a corequisite course of HONR 4056. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sciences Honors Course

HONR 4056 (1-3) Service Practicum: Discourse Analysis and Cultural Criticism

Help communities in need, with credit hours varying according to time commitment. The practicum provides experiential and intellectual understanding of the discourses and dynamics that maintain major cultural hierarchies of values and of resource distribution.

Requisites: Requires a corequisite course of HONR 4055. Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sciences Honors Course

HONR 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sciences Honors Course

HONR 4959 (3-6) Honors Thesis

Requires approval of Honors Program.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sciences Honors Course

Humanities (HUMN)

Courses

HUMN 1110 (3) Introduction to Humanities: Literature 1

Introduces students to works from the major Western literary periods (Classical, Medieval, Renaissance, Baroque) from the 8th c. BC to the early 17th c. AD comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinary, genre studies, periodization, comparativism, thematology, hermeneutics, criticism, etc.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1120 (3) Introduction to Humanities: Literature 2

Introduces students to works from the major Western literary periods (Baroque, Enlightenment, Romanticism, Realism, Modernism) from the 17th- through the 20th-centuries comparatively, i.e., outside their national literary boundaries. Theorizes interdisciplinarity, genre studies, periodization, comparativism, thematology, hermeneutics, criticism.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1210 (3) Introduction to Humanities: Art and Music 1

Examines the major artistic and musical works in the Western tradition from ancient Greece through the 16th century in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1220 (3) Introduction to Humanities: Art and Music 2

Examines the major artistic and musical works in the Western tradition from the 17th century to 21st-century post-modernism in their larger historical, interdisciplinary, and theoretical ("aesthetic") contexts.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 1400 (3) Mediterranean Foundations

Examines the pre-Modern Mediterranean as the foundational zone of Western Humanism and culture, beginning with Classical Antiquity and through to the dawn of Modernity. Through history, art, literature and thought, it studies the region's role as the crucible of Hellenic-Persian culture, Roman society, of Judaism, Christianity and Islam, the intersection of Europe, Africa and Asia in the development of Modernity.

Grading Basis: Letter Grade

HUMN 1701 (3) Nature and Environment in German Literature and Thought

Critically examines titles in German literature and thought. Nature and environment are used to explore alienation, artistic inspiration, nihilism, exploitation, sexuality, rural versus urban, meaning of the earth, cultural renewal, identity and gender. This "Green" survey of German classics spans Romanticism's conception of nature as unconscious spirit to the politics and values of contemporary Germany's Green party.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 1701

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 2000 (3) Methods and Approaches to the Humanities

Provides a transition from the introductory courses to the upper-division courses. Introduces the various technical methods and topics encountered in the department's comparative, interdisciplinary upper-division courses, including cultural studies, rhetoric, translation, hermeneutics, word/image studies.

Requisites: Restricted to Humanities (HUMN) majors and minors only.

HUMN 2100 (3) Arts, Culture and Media

Promotes a better understanding of fundamental aesthetic and cultural issues by exploring competing definitions of art and culture. Sharpens critical and analytical abilities by asking students to read and compare different theories about arts, culture, media, and identity, and then to apply and assess those theories in relation to a selection of visual and verbal texts from a range of cultural and linguistic traditions.

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 2145 (3) African America in the Arts

Introduces interrelationships in the arts of African Americans and the African American contribution to American culture as a whole.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: United States Context

HUMN 2601 (3) Kafka and the Kafkaesque

Exposes the students to a wide selection of Kafka's literary output and aims to define the meaning of the Kafkaesque by looking not only for traces of Kafka's influence in the verbal and visual arts, but also for traces left in Kafka's own work by his precursors in the literary tradition.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 2601

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3092 (3) Studies in Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3093 (3) Topics in Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3104 (3) Film Criticism and Theory

Surveys the range and function of film criticism, introduces major positions and concepts of film theory and focuses on students' abilities to write about film.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3104

Requisites: Requires prerequisite course of FILM 1502 (minimum grade D-).

HUMN 3200 (3) Fictions of Illness: Modern Medicine and the Literary Imagination

Examines the ways in which the rise of modern medicine fueled the literary imagination with a new focus, new patterns of perception and potent metaphors. Through a study of various works of fiction, critical theory and medical history, the course traces how medical discoveries and the increasing professionalization of medicine manifested itself in modern literature.

Requisites: Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

HUMN 3210 (3) Narrative

Explores the nature of sacred and secular narrative in literature, film, and the visual arts.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3211 (3) The Craft of Mystery

Explores examples of and theories about the formation and growth of the genre of detective fiction, especially in the late 19th and early 20th centuries. Explores the social conditions of the times in which the texts were written and the possible resulting influences on style. Compares the texts and theories to examples from other genres and time periods.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3212 (3) Shipwrecks, Mutinies, and Other Catastrophes at Sea

Explores the theatrical analogy that frames our understanding of catastrophes at sea and their literary and visual representation, paying particular attention to issues of gender, race, and sexuality, which are intentionally banned from such representations, but turn out to be their secret focus.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3240 (3) Tragedy

Studies some of the great tragic works of art, music, and literature from the Greeks to the 20th century. Tragic theory is invoked as an aid to interpretation.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3290 (3) Foundations of Disability Studies

Introduces students to the interdisciplinary field of disability studies by investigating key concepts in disability theory, disability history and culture, media representations of people with disabilities, and pertinent bioethical issues.

HUMN 3310 (3) The Bible as Literature

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3310 and JWST 3310

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 3321 (3) Culture and Literature of Ancient China

Focuses on the religious, cultural, philosophical, and literary aspects of ancient Chinese civilization (1500 B.C.-A.D. 200). Special attention is paid to foundational works that influenced later developments in Chinese culture. All readings are in English.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 3321

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Departmental Category: Asia Content

HUMN 3341 (3) Literature and Popular Culture in Modern China

Surveys 20th century Chinese literature and popular culture against the historical background of rebellion, revolution and reform. Emphasizes close and critical reading skills and an understanding of how aesthetic texts reflect and critically engage with historical and cultural experiences. Assignments include novels, essays, short stories, poems, plays, songs, films and scholarly articles. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 3341

Recommended: Prerequisite CHIN 1012 or CHIN 1051.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Asia Content

HUMN 3500 (3) Literatures of Consciousness

Facilitates a complex and productive understanding of consciousness by analyzing and synthesizing interdisciplinary works (including literature, film and theoretical and scientific texts). This interdisciplinary approach enables students to think deeply about the following questions: what is consciousness? How do we think and perceive? What does it mean to be "neurotypical"? What does all of this have to do with who we are?

Requisites: Requires a prerequisite course of HUMN 2000 (minimum grade C-) or restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 3505 (3) The Enlightenment: Tolerance and Emancipation

Examines Enlightenment notions of reason, humanity and social progress. Topics include 18th century views on government, science, education, religion, slavery and gender roles.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3505

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 3640 (3) Modernisms: Art and Theory from 1900 to 1960

Offers an introduction to Modernism in various media, emphasizing in particular the historical development of the visual arts from German Expressionism and Cubism to Neo-Dada and Pop Art. Readings in literature will include Proust, Beckett, Blanchot and poets associated with various art movements. Theoretical readings range from Saussure and Freud to Adorno and Jameson. Recommend prerequisite: HUMN 2000.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 3660 (3) The Postmodern

Analyzes the cultural and critical practices as well as the thought that defines the postmodern period at the end of 20th century.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3660

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3702 (3) Dada and Surrealist Literature

Surveys the major theoretical concepts and literary genres of the Dada and Surrealist movements. Topics include Dada performance and cabaret, the manifesto, montage, the ready made, the Surrealist novel, colonialism and the avant-garde, and literary and philosophical precursors to the avant-garde.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3702

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3802 (3) Politics and Culture in Berlin 1900-1933

Examines early 20th century German culture, with emphasis on the Weimar Republic (1918-1933) in light of contemporaneous political discussions. The course presents modern art and literature (Expressionism, Dada, Brecht's epic theater) and architecture and design (Bauhaus, Werkbund) as well as political movements of women, sexual minorities, and Berlin's Jewish communities. Taught in English. Offered through CU Study Abroad Program.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3802

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 3811

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Asia Content

HUMN 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts. Attention is given to various approaches of literary analysis and interpretation. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 3841

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Asia Content

HUMN 3850 (3) The Mediterranean Religion Before Modernity

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3850

Additional Information: Arts Sci Core Curr: Historical Context

HUMN 3860 (3) Politics and the Arts in the Information Age

Examines the political aspects of the art and literature of the information age, with a focus on conceptual practices since 1965. The course investigates political theories of art along side sculpture, performance, installation, poetry, and graphic design.

Recommended: Requisite HUMN 2000 or restricted to students with 57-180 credits (Junior or Senior).

HUMN 3930 (1-6) Humanities Internship

Students gain academic credit and professional experience working in museums, galleries, arts administration, and publishing. They work 3-18 hours per week with their professional supervisor and meet regularly with a faculty advisor who determines the reading and writing requirements. An interview with faculty advisor is required.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 3935 (1-3) Humanities Internship: Literature and Social Violence
See HUMN 4835.

Requisites: Requires enrollment in corequisite course of HUMN 4835.

HUMN 4000 (3) The Question of Romanticism

Interdisciplinary study of literature, art, and music from 1780 to 1830 in France, England, and Germany.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4004 (3) Topics in Film Theory

Provides topic-centered analyses of controversial areas in film theory. Students read extensive materials in the topic area, analyze and summarize arguments as presented in the literature, write "position" papers and make oral presentations in which they elaborate their own arguments about specific assigned topics, establishing critical dialogue with the primary materials.

Equivalent - Duplicate Degree Credit Not Granted: FILM 4004 and ARTF 5004

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of FILM 3051 (minimum grade D-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Film (FILM or FMST) or Humanities (HUMN) majors only.

HUMN 4010 (3) Hitchcock and Freud

Applies Freudian psychoanalysis to the films of Alfred Hitchcock. Students will familiarize themselves with the Freudian methodology by reading a number of books and essays and then apply both Freud's general ideas as well as specific texts to particular aspects, both formal and contentual, of his films. Particular attention will be given to the important field of "feminism and psychoanalysis" as it relates to the study of the role of women in Hitchcock's films.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 4011 (3) The Criminal-Hero

Studies various theories of literary transgression by Aristotle, Nietzsche, Freud, Bataille and others to understand the many works, beginning with Genesis and the Iliad and including contemporary works such as Norman Mailer's *The Executioners Song* and the films of Herzog (*Aguirre*, *Nosferatu*) and Scorsese (*Taxi Driver*, *Cape Fear*) which feature this paradoxical figure.

HUMN 4020 (3) Reading, Chance, and Guessing

Considers the method of the humanities as opposed to those of the natural and social sciences, especially in view of their respective ability or claim to predict the future and to master chance.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4030 (3) The Art of Travel

Examines the art of travel: not where to go and what to do, but rather philosophical concepts about why people travel. Areas of discussion will include exploration, discovery, escape, pilgrimage, the grand tour, expatriotism, exile, nomadism, armchair travel, and the sense of home. Materials will include books by travel writers, novels, films, essays, short stories, art, music, and historical documents.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4050 (3) Representations of People with Disabilities

Examines the representation of people with disabilities in canonical and contemporary literature and drama, and introduces students to disability theory and the history of people with disabilities.

HUMN 4060 (3) Modern Critical Theory

Explores, through guided discussions, the concept of theory itself and how a theory is constructed. Emphasizes the close reading of theory in order to learn to analyze critically, considering theory as something to be thought about rather than simply applied.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4082 (3) 19th Century Art and Literature

Interdisciplinary study of English fiction and poetry together with related movements in visual arts.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4092 (3) Advanced Studies in the Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4093 (3) Advanced Topics in the Humanities

Students should check with the department for specific semester offerings.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4100 (3) Writing the World in Traditional China

Examines the history and implications of the central role played by writing in pre-modern China, especially with regard to traditional constructions of the world, including relations with aesthetics, the non-human, and the spiritual. Key works of Chinese literature and thought from different periods are studied, with the aim of determining a particular type of Chinese humanism. All readings in English.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Asia Content

HUMN 4110 (3) Greek and Roman Epic

Students read in English translation the major epics of Greco-Roman antiquity such as the Iliad, Odyssey, Argonautica, Aeneid, and Metamorphoses. Topics discussed may include the nature of classical epic, its relation to the novel, and its legacy. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4110 and CLAS 5110

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4111 (3) Modern and Contemporary Culture

Examines the legacy of the historical avant-garde (1910-1930) in postwar and contemporary culture: 1945 to the present. We will study the construction of a "neo-avant-garde" in diverse fields (art, film, philosophy) as well as the methodology of "social art history" which, like the artistic neo-avant-garde, critically analyzes the relation between aesthetic production and global capitalism.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Grading Basis: Letter Grade

HUMN 4120 (3) Greek and Roman Tragedy

Intensive study of selected tragedies of Aeschylus, Sophocles, Euripides and Seneca in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4120 and CLAS 5120

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4130 (3) Greek and Roman Comedy

Studies Aristophanes, Plautus, and Terence in English translation. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4130 and CLAS 5130

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4131 (3) The Greek and Roman Novel

Studies a number of complete Greek and Roman novels from Classical Antiquity and their predecessors and contemporary neighbors in the genres of Greek prose fiction. Ancient texts in English translation.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4140 and CLAS 5140

HUMN 4135 (3) Art and Psychoanalysis

Explores psychoanalytic theory as it relates to our understanding of literature, film and other arts. After becoming familiar with some essential Freudian notions (repression, narcissism, ego/libido, dreamwork, etc.), students apply these ideas to works by several artists (e.g., Flaubert, James, Kafka, Hoffmann and Hitchcock).

Equivalent - Duplicate Degree Credit Not Granted: FILM 4135

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4140 (3) The Age of Dante: Readings from The Divine Comedy

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4140 or 4145 or ITAL 4147

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages

Studies Boccaccio's masterpiece, the Decameron, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4150

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Literature and the Arts

HUMN 4155 (3) Philosophy, Art, and the Sublime

Explores philosophies of art, theories of the sublime, and the relation between art and morality through philosophy, literature, and the visual arts. Includes works by Plato, Longinus, Burke, Rousseau, Kant, Mary Shelley, Melville, Friedrich, Turner, and Pollock.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 4170 (3) Fiction and Reality: Literature, Science, and Culture

Explores the significance of how one defines "fiction" and "reality". Begins by defining the core concepts and compares them with related terms. Lectures and discussions analyze the implications of these concepts from the perspective of a variety of disciplines and in the context of diverse issues in order to develop a critical awareness of them. Reading and writing intensive.

Recommended: Requisite HUMN 2000 and restricted to students with 57-180 credits (Junior or Senior).

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4502 (3) Nietzsche: Literature and Values

Emphasis is placed on Nietzsche's major writings spanning the years 1872-1888, with particular attention to the critique of Western values. A systematic exploration of doctrines, concepts and ideas leading to the values of creativity.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4502

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

HUMN 4504 (3) Goethe's Faust

Systematic study of the Faust motif in Western literature, with major emphasis on Faust I and II by Goethe and Thomas Mann's Doctor Faustus.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4504 and GRMN 5504

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4552 (3) The Harlem Renaissance: Fr Black Wmn's Club Mvmnt to Hip Hop

Offers an interdisciplinary and intersectional overview of the origins and evolution of the Harlem Renaissance. Explores classic texts, music and works of art emerging from the Harlem Renaissance and related events and movements of its epoch: the Black Women's Club Movement, New Negro Movement, Pan-African Movement, Lost Generation, Jazz Age, World War I and World War II.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4552 and ETHN 5552

Requisites: Requires prerequisite course of ETHN 1022 or ETHN 2001 or ETHN 3212 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

HUMN 4555 (3) Interpreting Art

Introduces various methods of interpretation (New Criticism; Reader Response; structuralism, post-structuralism, psychoanalysis, art history, etc.) with which to examine how one determines the meaning of the work of art. Methodologies are studied in close conjunction with particular poems, paintings, stories and films.

Requisites: Requires either prerequisite course of HUMN 2000 (minimum grade D-) or restricted to students with 57-180 credits (Junior or Senior).

HUMN 4650 (3) Religion, Power, Modernity

Examines the representation of religion in relationship to the claims made by modern narratives of power in fables, literature, graphic novels, visual materials and critical writings.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

HUMN 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4730

Additional Information: Arts Sci Core Curr: Human Diversity

HUMN 4811 (3) 19th Century Russian Literature

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4811

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4821 (3) 20th Century Russian Literature and Art

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4821

Additional Information: Arts Sci Core Curr: Literature and the Arts

HUMN 4835 (3) Literature and Social Violence

Provides a theoretical understanding of heightened awareness arising from literary and sociological investigations of contemporary sources of social violence (gang culture, racism, domestic violence), combined with the concrete knowledge offered by an internship in a social service agency. Optional internship credit is available.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Contemporary Societies

HUMN 4840 (1-3) Independent Study

May be repeated for a maximum of 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

HUMN 4845 (3) Reading Culture: The Meanings We Make

Analyzes a range of literary and cultural texts through the lens of critical theory in order to come to more understanding of how we are making meaning, how those meanings make us and how we might use that awareness to open new fields of possibility, both in our readings of texts and in our reactions to cultural contexts and conventions.

Grading Basis: Letter Grade

HUMN 4950 (1-6) Honors Thesis

Supervised project on a topic of the student's own choosing. It should demonstrate ability in interdisciplinary (such as literature and art, art and music, film and literature, literature and theory), extensive research, critical thinking, and excellent writing skills. The thesis is submitted to the Honors Program of the College of Arts and Sciences and is orally defended.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Humanities (HUMN) majors only.

Humanities for Engineers (HUEN)

Courses

HUEN 1010 (3) Humanities for Engineers

Explores a wide variety of challenging and interesting humanistic themes (love, responsibility, ambition, etc.) in many forms (fiction, philosophy, plays, poetry, art, music, etc.). In small discussion-based classes, emphasizes the writing, public speaking and critical thinking skills needed to excel as a professional engineer. Fulfills College of Engineering writing requirement for first-year freshmen only.

Requisites: Restricted to students with 0-26 (Freshmen) College of Engineering majors only.

HUEN 1843 (3) Special Topics

Explores different important themes in the humanities; check with the department for specific semester topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Engineering majors only.

HUEN 1850 (3) Engineering in History: The Social Impact of Technology

Explores how engineering has shaped who we are, how we think, and what we think about, by examining preconceived notions of progress, property, time, and work. Textbook readings plus original sources in philosophy, literature, psychology, and economics provide a rich and stimulating tour of engineering history.

Requisites: Restricted to students with 0-56 (Freshmen or Sophomore) College of Engineering majors only.

HUEN 2010 (3) Tradition and Identity

Explores the place and possibility of personal identity both within and against the influence of tradition, including family, culture, language, and social, political and economic institutions. Via literature and film, wrestles with the nature of freedom, self-determination, and belonging.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2020 (3) The Meaning of Information Technology

Surveys the history of information technologies and modern techniques of information production, storage, transmission, and retrieval. Emphasizes understanding not only the technological transformations in interpersonal, organizational, and mass communication, but also the technological, social and political changes that underlie the movement toward a digital society.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 2000

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2100 (3) History of Science and Technology to Newton

Spans invention and discovery from the Stone Age to the age of Newton, raising questions about culture, history, and personal expectation; studies Pyramids, odometers, cathedrals, Galileo, etc., on the way.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2120 (3) History of Modern Science from Newton to Einstein

Surveys the great discoveries and theoretical disputes from Newtonian celestial mechanics to the theory of relativity. Includes physics, astronomy, chemistry, geology, and biology; closely examines scientific method, evolution, light and quantum theory. Uses original sources by Newton, Faraday, Lavoisier, Darwin, etc., for immediate contact with the great minds in science.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2130 (3) History of Modern Technology from 1750 to the Atomic Bomb

Surveys the great innovations from the Steam Age to the Atomic Age: transportation, modern construction, communications, internal combustion, etc. Supplements textbook accounts with drawings, patents, and original selections by Edison, Carnegie, Tesla, Bell, etc. Studies the sociological impact of social change via contemporary sources in literature, philosophy, painting and film.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 2210 (3) Engineering, Science, and Society

Explores challenges that engineering and science pose for society plus the ways that societies shape or impede science and engineering. Case studies range from contemporary issues (global warming, nuclear weapons, and genetic engineering) to classic cases (the execution of Socrates). Core texts in the Western Tradition supplement contemporary articles and films.

Requisites: Restricted to College of Engineering majors only.

HUEN 2843 (1-3) Special Topics

Explores different important themes in the humanities; check with the department for specific semester topics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

HUEN 3100 (3) Advanced Humanities for Engineers

Explores what it means to be a fully human being: through group discussion, closely examines individual works of culturally and historically significant philosophy, literature and art. Includes extensive writing. Fulfills the College of Engineering & Applied Science writing requirement. Department prerequisite: a minimum GPA of 3.0.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

HUEN 3200 (3) Humanities for Engineers 2

Continues HUEN 3100's discussion of the human condition by exploring culturally and historically significant works of multiple genres in small-group seminars. Alert class participation is required, and writing skills will be honed through regular assignments.

Requisites: Requires prerequisite course of HUEN 3100 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

HUEN 3350 (3) Gods, Heroes and Engineers: The Western Quest for Excellence

Investigates the intensely competitive quest of the ancient Greeks for excellence in everything from art and literature to science and war and also the odyssey of the mind generated by this quest, culminating in our modern world.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

Grading Basis: Letter Grade

HUEN 3430 (3) Ethics of Genetic Engineering: A Multidisciplinary Approach

Investigates the metaphorical, ideological and scientific constructs that inform debates over the genetic modification of humans, animals and plants. Begins with a close reading of Shelley's *Frankenstein*, proceeds to a consideration of philosophical arguments for and against human modification and concludes with a consideration of the scientific and political contexts that inform the regulation of genetically modified foods.

Requisites: Restricted to College of Engineering (ENGRU) undergraduates only.

Grading Basis: Letter Grade

HUEN 3700 (3) Culture Wars in Rome

Investigates in Rome, Italy (during Maymester), the cultural contrasts among three different cities: ancient, pagan, aristocratic Rome; medieval, Christian, theocratic Rome; and modern, secular, democratic Rome. Draws on evidence from Roman literature, politics, art and architecture. Must have completed a minimum of 26 credit hours by start of course. Requires some preparatory work in Boulder.

Repeatable: Repeatable for up to 6.00 total credit hours.

HUEN 3750 (3) Xi'an, China: Self-Awareness and Images of the Other

Explores Chinese culture abroad, focusing on ideas of self and other within special historical, social, political and economical circumstances. Chinese and American concepts of self and society, of individual, collective and national identities will be analyzed. Held on the campus of Xi'an Jiaotong University, China.

Requisites: Requires prerequisite course of HUEN 1010 (minimum grade D-).

Additional Information: Departmental Category: Asia Content

HUEN 3840 (1-3) Independent Study

Offers an opportunity for students to do independent work in the humanities. Subject arranged to fit the needs of the student. Department consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) College of Engineering students only.

HUEN 3843 (1-3) Special Topics

Explores different important themes in the humanities, check with department for specific semester topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering students only.

HUEN 4200 (3) Humanities for Engineers 4

Provides opportunity to pursue a variety of humanistic themes related to Herbst Humanities Program.

HUEN 4800 (1) Leadership & Ethics in the Real World

Indonesian (INDO)

Courses

INDO 1010 (5) Beginning Indonesian 1

Provides a thorough introduction to the modern Indonesian language, emphasizing speaking, listening, reading and writing skills. This course is proficiency-based. Activities aim to place the student in the context of the native-speaking environment from the very beginning. Students will be provided opportunities to participate in local Southeast Asian cultural events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Indonesian

INDO 1020 (5) Beginning Indonesian 2

Continuation of INDO 1010. Provides a thorough introduction to the modern Indonesian language, emphasizing the context of the native-speaking environment from the very beginning. Students will be provided with opportunities to participate in local Southeast Asian events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

Requisites: Requires prerequisite course of INDO 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Indonesian

INDO 2010 (4) Intermediate Indonesian 1

Aims to increase the students' proficiency in listening, speaking, reading, and writing in modern Indonesian. Students will use only Indonesian in class. Evaluation based on classroom performance, homework, tests, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

Requisites: Requires prerequisite courses of INDO 1010 and INDO 1020 (all minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Indonesian

INDO 2020 (4) Intermediate Indonesian 2

Continuation of INDO 2010. Aims to increase the students' proficiency in listening, speaking, reading, and writing in modern Indonesian. Students will use only Indonesian in class. Evaluation based on classroom performance, homework, tests, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Students with previous experience with Indonesian or Malay should contact the instructor for placement.

Requisites: Requires prerequisite course of INDO 2010 (minimum grade C).

Additional Information: Departmental Category: Indonesian

INDO 3010 (3) Advanced Indonesian 1

Develops students' proficiency in language skills in modern Indonesian. Emphasis is on students' command in leading discussion and writing in formal Indonesian. Students read classic and contemporary authentic materials. Evaluation based on classroom performance, essays, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Fluent Indonesian or Malay speakers who wish to learn more about Indonesian cultures should contact the instructor for placement.

Requisites: Requires prerequisite course of INDO 2020 (minimum grade C).

Additional Information: Departmental Category: Indonesian

INFO 3020 (3) Advanced Indonesian 2

Continuation of INFO 3010. Develops students' proficiency in language skills in modern Indonesian. Emphasis is on students' ability to lead discussion and write in formal Indonesian. Students read classic and contemporary authentic materials. Evaluation based on classroom performance, essays, and final project. Students will be provided with opportunities to participate in local Southeast Asian cultural events. Fluent Indonesian or Malay speakers who wish to learn more about Indonesian cultures should contact the instructor for placement.

Requisites: Requires prerequisite course of INFO 3010 (minimum grade C).

Additional Information: Departmental Category: Indonesian

Information Science (INFO)

Courses

INFO 1101 (3) Computation in Society

Introduces students to modern information and communication technology, the basic principles of software and programming, the fundamental role of algorithms in modern society, computational reasoning, the major organizations in the information sector and fundamental interactions between humans and information technology. Appropriate for students with limited prior experience with computing. Fulfills the CMCI computing requirement.

Grading Basis: Letter Grade

INFO 1111 (4) Representations Seminar and Studio

Expands students' perspectives on fundamental categories of human experience and helps them develop critical perspectives on how that experience is constructed. Focuses on the ways in which experiences and world views reflect cultural and social differences. Studio format enables students to directly understand how systems of convention live in the simplest of representations.

Grading Basis: Letter Grade

INFO 1112 (4) Representations Seminar and Studio

Expands students' perspectives on fundamental categories of human experience and helps them develop critical perspectives on how that experience is constructed. Focuses on the ways in which experiences and worldviews reflect cultural and social differences. Studio format enables students to directly understand how systems of convention live in the simplest of representations.

Requisites: Requires enrollment in corequisite course of INFO 1111.

Grading Basis: Letter Grade

INFO 1121 (4) Interactions Seminar and Studio

Provides an introduction to thinking about human-centered design and the universal requirements of interactions with data, information and technologies. Studio experiences challenge students to consider the impact that design choices in information and computing technologies have on a) enabling diverse audiences to access, manipulate and experience information, and b) how differences get encoded by data structures, ultimately reflecting biases.

Requisites: Requires enrollment in corequisite course of INFO 1122.

Grading Basis: Letter Grade

INFO 1122 (3) Interactions Seminar

Surveys key concepts and theories in Information Science, focusing on the ways information enables new ways of living, working and thinking. Students will critically examine texts, systems and interpretations of data from a variety of disciplinary perspectives that speak to how people, infrastructures and contexts constrain and enable uses of information.

Requisites: Requires enrollment in corequisite course of INFO 1121.

Grading Basis: Letter Grade

INFO 1201 (3) Computational Reasoning 1: Expression and Media Transformation

Introduces principles of computational thinking through the manipulation, transformation and creation of media artifacts, such as images, sound and web pages. Students will be exposed to a high-level overview of algorithms, functions, data structures, recursion and object-oriented computer programming through a series of assignments that emphasize the use of computation as a means of creative expression.

Grading Basis: Letter Grade

INFO 1301 (3) Quantitative Reasoning 1: Intuitions and Evidence

Surveys concepts and techniques for characterizing and quantifying data. Students will learn to use different types of quantitative data, to summarize data with descriptive statistics, to measure similarity of different datasets, to interpret probabilities and statistical significance and to quantify and predict changes in data.

Grading Basis: Letter Grade

INFO 2001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

Grading Basis: Letter Grade

INFO 2131 (4) Ecosystems Seminar and Studio

Provides direct experience analyzing complex social systems of systems and develops students' ability to learn to listen for (and mediate among) diverse, discordant voices and values within larger communities, organizations and institutions. Employs a variety of qualitative research techniques in the studio, including interviewing, participant observation and ethnographic reflections on differences in communities of practice.

Requisites: Requires enrollment in corequisite course of INFO 2132.

Grading Basis: Letter Grade

INFO 2132 (3) Information Science Ecosystems Seminar

Surveys key concepts and theories in Information Science, focusing on the ways that communities, organizations and institutions influence the design and use of information. Students will critically examine texts, systems and interpretations of data from multiple disciplinary perspectives that speak to the complex interactions among the people and technologies that surround us and the ecosystems form by and through data.

Requisites: Requires enrollment in corequisite course of INFO 2131.

Grading Basis: Letter Grade

INFO 2201 (3) Computational Reasoning 2: Representations of Data

Surveys techniques for representing data and expressing relationships among data, both at small scales (for example, via programmatic data structures) and at large scales (for example, in various kinds of database systems). Introduces fundamentals of algorithm analysis and the trade-offs involved in managing data using different approaches, tools and organizing principles.

Requisites: Requires prerequisite course of INFO 1201 or CSCI 1300 or CSCI 1310 (minimum grade C-).

Grading Basis: Letter Grade

INFO 2301 (3) Quantitative Reasoning 2: Uncertainty and Inference

Introduces intermediate-level methods for quantitative data analysis, focusing on foundational concepts in probability and statistical inference along with complementary computational skills and tools. The course will cover basic probability concepts, common probability distributions and methods for estimating their parameters, multivariate regression with applications to forecasting and classification and a variety of methods of statistical significance testing.

Requisites: Requires prerequisite course of INFO 1201 and INFO 1301 (all minimum grade C-).

Grading Basis: Letter Grade

INFO 3001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen fields.

Grading Basis: Letter Grade

INFO 3101 (3) History of Information, Science and Society

Focusing on two topics: the changing role of information in everyday life over time and the increasing role of information in disciplinary studies such as social science, engineering, computer science, mathematics, digital humanities. Examines information related academic disciplines, businesses, industries and technologies from multiple perspectives from the 17th century to the present.

Grading Basis: Letter Grade

INFO 3401 (3) Information Exploration

Teaches students how to use information to identify interesting real world problems and to generate insight. Students will learn to find, collect, assemble and organize data to inspire new questions, make predictions and work towards solutions. They will learn to appropriately apply different methods (including computational, statistical and qualitative) for exploratory data analysis in a variety of domains.

Requisites: Requires prerequisite course of INFO 2201 and INFO 2301 and INFO 1121 or INFO 2131 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 3402 (3) Information Exposition

Teaches students to communicate information to a wider audience and construct stories with data across a variety of domains. Students will learn to use data for rhetorical purposes, applying visual, statistical and interpretative methods. Students will learn to think critically about ethical and social implications of using data in expository media, including identification of bias.

Requisites: Requires prerequisite course of INFO 1301 or INFO 2301 (minimum grade C). Restricted to students with 57-180 credits (Junior or Senior) Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 3501 (3) Problems in Information Science: Peer Production and Crowdsourcing

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations. Problems in Information Sciences is a series that brings contemporary research to the classroom in the form of progressive, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5501

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 3502 (3) Problems in Information Science: Online Communities

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5502

Grading Basis: Letter Grade

INFO 3503 (3) Problems in Information Science: Everyday Information Behavior

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information on line. Students learn to analyze the informational dimensions that occur in their everyday lives.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5503

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 3504 (3) Problems in Information Science: Digital Identity

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. "Problems in Information Science" is a series that brings contemporary research to the classroom in the form of progress, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5504

Grading Basis: Letter Grade

INFO 3505 (3) Problems in Information Science: Designing for Creativity and Learning

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5505

Grading Basis: Letter Grade

INFO 4001 (1) Information Science Portfolio and Professional Development

Facilitates career development through the disciplined reflection about and presentation of one's work using a variety of modalities across a variety of media. Students will be introduced to individuals and organizations representing a diversity of career paths in their chosen field.

Grading Basis: Letter Grade

INFO 4601 (3) Ethical and Policy Dimensions of Information, Technology and New Media

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5601

Requisites: Restricted to students with 55 or more hours.

Grading Basis: Letter Grade

INFO 4602 (3) Mastery in Information Science: Information Visualization

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5602

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 4603 (3) Mastery in Information Science: Survey Research Design

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5603

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 4604 (3) Applied Machine Learning

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5604

Requisites: Requires prerequisite courses of INFO 2201 and INFO 2301 (all minimum grade D-).

Grading Basis: Letter Grade

INFO 4605 (3) Mastery: Ethnographic Research in Applied Settings

Familiarizes students with ethnography as a research tool as it is used in corporate and consulting research. Systematically explores issues and topics in research for the purposes of product design and development.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5605

Requisites: Requires a minimum of 45 hours taken.

Grading Basis: Letter Grade

INFO 4611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

Equivalent - Duplicate Degree Credit Not Granted: INFO 5611

Requisites: Restricted to students with a minimum of 45 units.

Grading Basis: Letter Grade

INFO 4700 (3) Senior Capstone

Provides senior level INFO students an opportunity to demonstrate the culmination of their learning in the major by designing and implementing a significant information system or developing a research question, typically in response to a problem of personal interest related to or informed by their secondary area of specialization. Reinforces project planning, public presentation and ethic skills.

Requisites: Restricted to Information Science (INFO) majors only with a minimum of 90 hours.

Grading Basis: Letter Grade

INFO 4800 (1-3) Leadership Practicum in Information Science

Equips students for taking on leadership roles in the interdisciplinary context of information science. Students will learn to facilitate learning among students with diverse backgrounds and expertise, developing communication and mentoring skills and gaining exposure to a variety of learner-centered design strategies and pedagogical approaches. Enrollment is by invitation and at the discretion of the instructor.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 4841 (1-4) Undergraduate Independent Study

Undergraduate independent study.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 4871 (3) Special Topics

Special topics.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

INFO 4900 (1-6) Research Experience in Information Science

Provides research experience in information science. Students will contribute to the construction of new knowledge of novel systems, helping to answer current research questions or to solve contemporary problems in the domain. Enrollment is by invitation and discretion of the advising faculty member.

Repeatable: Repeatable for up to 12.00 total credit hours.

Grading Basis: Letter Grade

INFO 4931 (1-6) Undergraduate Internship

Undergraduate internship.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Information Science (INFO) majors only.

Grading Basis: Letter Grade

INFO 5000 (3) Introduction to Doctoral Studies in Information Science

Introduces students to practices associated with successful advancement in a doctoral program, rigorous scholarship in Information Science and more expert and early participation in their scholarly community of practice.

Grading Basis: Letter Grade

INFO 5101 (3) Theories and Concepts in Information Science

Surveys foundational theories and concepts in Information Science.

Students will learn to read and reflect critically about seminal texts, tracking their intellectual genealogies from a variety of originating disciplines to their appropriation by Information Science. Students will apply these theories to contemporary issues and problems.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.

Grading Basis: Letter Grade

INFO 5201 (3) Interdisciplinary Ways of Knowing

Introduces principles of research design and surveys the breadth of research methods appropriated by the field of information science.

Students will explore the diversity of epistemological orientations that make up the field, that influence the types of often mixed research methods applied and that shape the kinds of questions that are and are not explored.

Grading Basis: Letter Grade

INFO 5301 (3) Computation for Research in Information Science

Introduces principles of computational thinking through the manipulation, transformation and creation of data artifacts used in research. Students will be exposed to a high-level overview of algorithms, functions, data structures, recursion and object-oriented computer programming through a series of assignments that emphasize the use of computation as a means of scholarship.

Grading Basis: Letter Grade

INFO 5401 (3) Information and Ideas in Design Disciplines

Introduces principles and practices from user-centered design disciplines and examines how those principles and practices intersect with contemporary issues in information science. Theory, research and exemplary practices from interaction, graphic, product, communication and experience design are introduced through readings, problems and case histories. Project provide direct experience with common design tools and processes.

Grading Basis: Letter Grade

INFO 5501 (3) Problems in Information Science: Peer Production and Crowdsourcing

Analyzes the mechanisms of peer production and crowdsourcing systems like Wikipedia and OpenStreetMap. Students will investigate how these crowdsourced platforms work socially and technically, develop skills using tools for their analysis and critically evaluate platform and community limitations. Problems in Information Sciences is a series that brings contemporary research to the classroom in the form of progressive, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3501

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

INFO 5502 (3) Problems in Information Science: Online Communities

Explores practical and theoretical topics in online communities through inquiry into one or more particular online communities. Student projects will explore online communities as social and technical systems, including their alignment with conceptualizations of community, expressed and apparent interests, nature of membership and participation, history, participants' motivations for involvement, and explicit, implicit, and infrastructural features that enable and constrain behaviors.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3502

Grading Basis: Letter Grade

INFO 5503 (3) Problems in Information Science: Everyday Information Behavior

Familiarizes students with practical and theoretical topics in the discipline of information behavior and its application to everyday events, activities and environments. Explores the information dimension of various everyday activities such as buying a car, playing a game or looking up health information on line. Students learn to analyze the informational dimensions that occur in their everyday lives.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3503

Grading Basis: Letter Grade

INFO 5504 (3) Problems in Information Science: Digital Identity

Explores and analyzes identity in a digital era. Through applied research, students investigate both social and technical aspects of how identity is captured, represented and experienced through technology using theoretical, empirical and design-based inquiry. Methods and platforms studied vary by semester. "Problems in Information Science" is a series that brings contemporary research to the classroom in the form of progress, project-based inquiry.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3504

Grading Basis: Letter Grade

INFO 5505 (3) Problems in Information Science: Designing for Creativity and Learning

Analyzes learning technologies, discusses learning theories and develops prototypes to investigate strategies for engaging people in creative and inclusive learning experiences. Students explore design, learning and technology by examining sociotechnical systems like construction kits, online communities and makerspaces with a critical lens on equity and inclusion. Studio format enables students to apply constructionist ideas into the design of technology-enabled environments.

Equivalent - Duplicate Degree Credit Not Granted: INFO 3505

Grading Basis: Letter Grade

INFO 5601 (3) Ethical and Policy Dimensions of Information, Technology and New Media

Explores ethical and legal complexities of information and communication technology. By combining real-world inquiry with creative speculation, students will probe everyday ethical dilemmas they face as digital consumers, creators and coders, as well as relevant policy. Explores themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4601

Grading Basis: Letter Grade

INFO 5602 (3) Mastery in Information Science: Information Visualization

Explores the design, development and evaluation of information visualizations. Covers visual representations of data and provides hands-on experience with using and building exploratory tools and data narratives. Students create visualizations for a variety of domains and applications, working with stakeholders and their data. Covers interactive systems, user-centered and graphic design, perception, data storytelling and analysis, and insight generation. Programming knowledge is strongly encouraged.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4602

Grading Basis: Letter Grade

INFO 5603 (3) Mastery in Information Science: Survey Research Design

Familiarizes students with practical and theoretical topics in using survey methods for conducting information science research. Through discussion and real world assignments, students will learn when and why to use surveys for collecting data; effective, efficient and ethical approaches to maximizing response; sampling issues; development of valid items and scales; and how to implement, analyze and report on survey data collection.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4603

Grading Basis: Letter Grade

INFO 5604 (3) Applied Machine Learning

Introduces algorithms and tools for building intelligent computational systems. Methods will be surveyed for classification, regression and clustering in the context of applications such as document filtering and image recognition. Students will learn the theoretical underpinnings of common algorithms (drawing from mathematical disciplines including statistics and optimization) as well as the skills to apply machine learning in practice.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4604

Grading Basis: Letter Grade

INFO 5605 (3) Mastery: Ethnographic Research in Applied Settings

Familiarizes students with ethnography as a research tool as it is used in corporate and consulting research. Systematically explores issues and topics in research for the purposes of product design and development.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4605

Grading Basis: Letter Grade

INFO 5611 (3) Mastery in Information Science: Ubiquitous Computer Experience Design

Introduces the field of ubiquitous computing, including sensors, ambient displays, tangibles, mobility, location awareness and context awareness. These topics are explored from a user-centered design perspectives, focusing on how a situated models of computing affect requirements gathering, interaction design, prototyping and evaluation. Students gain mastery with contemporary "UbiComp" technologies and learn to incorporate them into a user-centered design process.

Equivalent - Duplicate Degree Credit Not Granted: INFO 4611

Grading Basis: Letter Grade

INFO 5841 (1-3) Independent Study

Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

INFO 5871 (3) Special Topics

Topics will vary by semester.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

INFO 5931 (1-3) Internship

Internship

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

INFO 6101 (3) Theories and Concepts in Information Science

Surveys foundational theories and concepts in information science. Students will learn to read and reflect critically about seminal texts, tracing their intellectual genealogies from a variety of originating disciplines to their appropriation by information science. Students will apply these theories to contemporary issues and problems.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.

Grading Basis: Letter Grade

INFO 6201 (3) Interdisciplinary Ways of Knowing

Introduces principles of research design and surveys the breadth of research methods appropriated by the field of information science. Students will explore the diversity of epistemological orientations that make up the field, that influence the types of often mixed research methods applied and that shape the kinds of questions that are and are not explored.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.

Grading Basis: Letter Grade

INFO 6301 (3) Computation for Research in Information Science

Introduces principles of computational thinking through the manipulation, transformation and creation of data artifacts used in research. Students will be exposed to a high level overview of algorithms, functions, data structures, recursion and object oriented computer programming through a series of assignments that emphasize the use of computation as a means of scholarship.

Grading Basis: Letter Grade

INFO 6401 (3) Information and Ideas in Design Disciplines

Introduces fundamental principles and practices from user-centered design disciplines and examines how those principles and practices intersect with contemporary issues in information science. Theory, research and exemplary practices from interaction, graphic, product, communication and experience design are introduced through readings, problems and case histories. Projects provide direct experience with common design tools and exposure to leading practitioners.

Grading Basis: Letter Grade

INFO 6500 (1) Information Science Seminar

Enculturates graduate students in the discipline of Information Science through weekly seminar series that hosts guest speakers, internal faculty and graduate speakers and other community building and professional development activities.

Repeatable: Repeatable for up to 8.00 total credit hours.

Grading Basis: Letter Grade

INFO 6871 (3) Special Topics

Topics will vary by semester.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

INFO 7000 (3) Introduction to Doctoral Studies in Information Science

Introduces students to practices associated with successful advancement in a doctoral program, rigorous scholarship in information science and more expert and early participation in their scholarly community of practice.

Requisites: Restricted to Information Science (INFO) Ph.D. graduate students only.

Grading Basis: Letter Grade

INFO 7841 (1-3) Independent Study

Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to PhD students only.

INFO 7871 (3) Special Topics

Topics will vary by semester.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to PhD students only.

INFO 8991 (1-10) Dissertation

Dissertation.

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to PhD students only.

Integrative Physiology (IPHY)

Courses

IPHY 1950 (3) Introduction to Scientific Writing in Integrative Physiology

Provides an overview of writing skills and strategies, emphasizing those most important to the sciences, especially physiology. Focuses on fundamental skills, objective analysis, and scientific persuasion, with attention to clear organization and style, academic and scientific mechanics, and distinctions between audiences.

Requisites: Restricted to students with 0-86 credits (Freshmen, Sophomore or Juniors) only.

Additional Information: Arts Sci Core Curr: Written Communication MAPS Course: English

IPHY 2010 (1-3) Seminar in Integrative Physiology

Introduces a small group of lower-division students to current research topics in integrative physiology. Emphasizes relevant applications to real-world situations.

Repeatable: Repeatable for up to 6.00 total credit hours.

IPHY 2400 (2) Introduction to Medical Terminology for Future Health Professionals

Provides an introduction to medical terminology used within the health professions. Word roots, prefixes and suffixes used in medical records for major body systems will be examined and explained. The structure and functions of the major systems will be defined and described.

Recommended for IPHY students and students interested in pursuing a career in the health professions. No prerequisites required.

Grading Basis: Letter Grade

IPHY 2420 (3) Nutrition for Health and Performance

Focuses on the basic anatomy, physiology, and chemistry of nutrition.

Topics include weight management, the role of diet and lifestyle in disease prevention, specific nutrient deficiencies and toxicities, nutrition standards and guidelines, sports nutrition recommendations, agricultural practices, and food policy issues. IPHY juniors or seniors are excluded from taking this course.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 3400

Requisites: Restricted to non-IPHY majors or IPHY freshmen/sophomores (students with 0-56 credits) only.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

IPHY 2500 (1) Perspectives in Health and Medicine

Designed to increase awareness of issues that surround international and U.S. health care. Provides broad overview of topics relevant to 21st century medical practice. Includes guest lectures by faculty and practitioners from Denver Metro region, followed by opportunities to integrate new concepts using small group discussion and writing. Topics change each semester and may include: global development and health; socio-cultural issues in health care; health disparities; applied bioethics; health care system reform; narrative medicine.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Grading Basis: Pass/Fail

IPHY 2750 (3) Introduction to Exercise Psychology

Focuses on how psychological factors influence exercise and motor performance in both clinical and sport settings. Major topics include motivation, arousal, stress, imagery, self-confidence, concentration and burnout. Principles of psychological skills training are also discussed.

IPHY 2800 (4) Introduction to Statistics

Examines the application of statistics to research relevant to integrative physiology. Includes instruction and hands-on experience with related computer programs and interpretation of the results of their use.

Requisites: Restricted to Integrative Physiology (IPHY) majors only.

Recommended: Prerequisite MATH 1300.

IPHY 2910 (1-6) Practicum in Integrative Physiology

Offers practical experience in organized situations with direct supervision.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

IPHY 3010 (1-2) Teaching in Integrative Physiology

Provides an opportunity to assist in teaching specific laboratory sections in IPHY under direct faculty supervision. Students must make arrangements with the faculty member responsible for the course in which they plan to assist.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

IPHY 3060 (4) Cell Physiology

Lect. and lab. Introduces the biology of eukaryotic systems at molecular, cellular and systems levels of integration, emphasizing the complementarities of structure and function and physiological mechanisms of regulation at the cellular and molecular level. Department enforced prerequisite: one year of general biology (lecture + lab).

Requisites: Requires prerequisite course of IPHY 3430 or IPHY 3470 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

IPHY 3400 (3) Nutrition for IPHY Majors

Focuses on the science of nutrition, reviewing the basic anatomy, physiology and chemistry of nutrition. Concepts will focus on what the body needs for proper nutrition, how they are obtained, absorbed and processed by the body. Studies will expand to include the following: diet types, nutrition during life stages (i.e. pregnancy), different disease states and real world applications.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 2420

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Recommended: Prerequisite IPHY 3410.

Grading Basis: Letter Grade

IPHY 3410 (3) Introduction to Human Anatomy

Introduces the basics of human anatomy. Department enforced prerequisite: one year of general biology (lecture + lab).

IPHY 3415 (2) Human Anatomy Laboratory

Introduces structures of the human anatomical systems using human cadavers and animal tissue. This laboratory is meant to complement IPHY 3410. Department enforced prerequisites: one year of general biology (lecture + lab) and corequisite: IPHY 3410.

IPHY 3430 (3) Introduction to Human Physiology

Introduces the physiology of the nervous, muscular, cardiovascular, respiratory, urinary, immune, endocrine, digestive and reproductive systems. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Requisites: Requires prerequisite courses of CHEM 1133 and CHEM 1134 or CHEM 3321 and CHEM 3451 (all minimum grade C-). Restricted to non-Integrative Physiology (IPHY) majors only.

Recommended: Prerequisites IPHY 3410 and IPHY 3415.

IPHY 3435 (2) Physiology Lab

Introduces laboratory experience in selected aspects of human and comparative physiology for students in pharmacy and allied health programs. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 2800 (or equivalent); IPHY 3410, IPHY 3415 and IPHY 3430 (prerequisites for majors; recommended courses for non-majors); IPHY 3430 (non-majors only).

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-).

Recommended: Corequisite IPHY 3480 (majors only).

IPHY 3440 (3) Clinical Nutrition

Exploration of clinical nutrition concepts from a health care provider perspective. Examines how and why diseases develop and what nutritional therapy and intervention is appropriate for disease resolution.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

Recommended: Prerequisite IPHY 2420.

IPHY 3450 (3) Comparative Animal Physiology

Introduces principles of animal physiology and responses to environmental change. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

IPHY 3460 (5) Comparative Vertebrate Anatomy

Introduces major components of the vertebrate body and how they are organized into a whole organism, emphasizing function, evolution, and diversity of these basic features. Laboratories involve dissection of representative groups and demonstrations. Involves animals and/or animal tissues. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

IPHY 3470 (3) Human Physiology 1

Focuses on scientific thinking, cell physiology, neurophysiology, endocrinology, immunology and musculoskeletal physiology. First semester of a two-semester sequence for IPHY and NRSC majors only. Department enforced prerequisites: IPHY 3410 and one year of general biology (lecture and lab) and one year of general chemistry (lecture and lab).

Requisites: Requires prerequisite courses of CHEM 1133 and CHEM 1134 or CHEM 3321 and CHEM 3451 (all minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

IPHY 3480 (3) Human Physiology 2

Focuses on the physiology of the respiratory, cardiovascular, urinary, digestive and reproductive systems. The second semester of a two-semester sequence for IPHY and NRSC majors. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3410 and 3415.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Recommended: Corequisite IPHY 3435.

IPHY 3490 (3) Introduction to Epidemiology

Examines the history and uses of epidemiology, measures of disease frequency and occurrence, association and causality, analytic epidemiology, evidence-based screening and outbreak investigations.

Recommended: Prerequisites IPHY 2800 and SOCY 2061 and PSYC 3101.

IPHY 3500 (2) Applied Clinical Research

Introduces fundamental concepts of clinical research to those interested in pursuing a career in medicine or medical research. In addition to lectures introducing students to research design, errors in research and basic biostatistics, there will be significant emphasis on participation in on-going medical research at Denver Health Medical Center and The Children's Hospital. This unique experience will provide students with first-hand exposure to all aspects of clinical research. Department enforced prerequisites: one year of general biology (lecture + lab).

Recommended: Prerequisite CHEM 3111 and premedical focus and/or previous research experience.

IPHY 3580 (3) Sleep, Circadian Rhythms and Health

Examines the history of sleep and circadian rhythms; lifespan development of sleep and rhythms; observational, physiological and clinical measures of sleep; screening for sleep and circadian disorders; associations between poor sleep and circadian misalignment and health; and evidence-based sleep and circadian interventions/preventions in healthy and clinical samples. Department enforced prerequisites: one year general biology plus labs, and one semester of statistics.

IPHY 3660 (3) Dynamics of Motor Learning

Focuses on information processing approaches and dynamical systems theory as explanations for human motor learning and the coordination of movement. Various topics are discussed from both perspectives including practice organization, attainment of elite performance, and the production of novel movements.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

IPHY 3700 (3) Scientific Writing in Integrative Physiology

Takes a process-based approach to writing. Assignments and classroom experiences emphasize critical thinking, using scientific evidence and reasoning to construct original arguments, and applying conventions and problem-solving skills to craft successful documents. Department enforced prerequisite: IPHY 2800 or equivalent.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Additional Information: Arts Sci Core Curr. Written Communication

IPHY 3800 (3) Forensic Biology

Introduces basic concepts of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology, and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

IPHY 3810 (1) Forensic Biology Laboratory

Introduces basic laboratory techniques and procedures of modern forensic science with emphasis on biological aspects such as forensic entomology, forensic botany, hair analysis, forensic anthropology and forensic DNA analysis. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Recommended: Corequisite IPHY 3800.

IPHY 4010 (1-3) Seminar in Integrative Physiology

Introduces a small group of students to current research topics in integrative physiology, evaluation of current research and discussion of critical issues. Department enforced prerequisite: IPHY 2800 or equivalent.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

IPHY 4200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5200

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

IPHY 4440 (4) Endocrinology

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5440

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

IPHY 4470 (3) Biology of Human Reproduction

Anatomy and physiology of human reproduction, including gender determination, embryology, puberty, menstrual cycle, pregnancy, lactation, menopause, sexual behavior, sexual abnormalities and contraception. Open to nonmajors. Department enforced prerequisites: one year of general biology (lecture + lab).

Recommended: Prerequisites IPHY 3470 and IPHY 3480 (majors) or IPHY 3430 or (non-majors) or IPHY 4440.

IPHY 4480 (3) Comparative Reproduction

Focuses on comparative anatomy and physiology of reproductive system and the evolution of reproductive behavior in vertebrates and invertebrates. Topics include courtship, mating, fertilization, estrous and menstrual cycles and environmental control of seasonal reproduction. Department enforced prerequisite: one year of general biology (lecture + lab).

Recommended: Prerequisite IPHY 3480 (majors) or IPHY 3430 (non-majors).

IPHY 4490 (3) Case Studies in Public Health

Explores case studies in public health in how they have influenced our approach to disease outbreaks and disease resolution. Examines famous case studies in infectious disease, zoonoses and non-infectious diseases, including environmental and occupational exposure to see how they have changed our understanding of disease and responses by health and medical personnel. Examines special populations within public health, as well as discuss modern public health challenges.

Requisites: Requires prerequisite courses of IPHY 3490 (minimum grade D-).

Grading Basis: Letter Grade

IPHY 4540 (5) Biomechanics

Applies the principles of physics and physiology to the analysis of human movement. Quantitative analysis of the forces, torques, mechanical energy, power impulses and momentum associated with human movement. Mechanical properties of muscles, tendons, ligaments and bones. Department enforced prerequisites: PHYS 2010 or PHYS 1110 or IPHY 3410 and IPHY 2800.

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to Integrative Physiology (IPHY) or Neuroscience (NRSC) majors only.

Recommended: Prerequisites MATH 1300 or MATH 1310 or APPM 1350 and IPHY 3415.

IPHY 4580 (3) Sleep Physiology

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-).

IPHY 4600 (3) Immunology

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5600

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY), Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Recommended: Prerequisite IPHY 3060.

IPHY 4650 (5) Exercise Physiology

Examines physiological and biochemical adjustments that occur in the body with acute and chronic exercise. Topics center on physiological mechanisms pertaining to metabolic, cardiovascular, and hormonal alterations, the role of exercise in health and disease, soreness and fatigue, immune function, as well as exercise during varied environmental conditions. Department enforced prerequisites: IPHY 2800 or equivalent and IPHY 3480. Department enforced corequisite: IPHY 3410.

Requisites: Requires prerequisite course of IPHY 3470 and 3480 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

IPHY 4660 (3) Critical Thinking in Integrative Physiology

Covers specific integrative physiology topics in areas such as animal physiology, endothelial function, neurobiology, exercise immunology and exercise physiology. Department enforced prerequisite: 13-hours of IPHY coursework.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

IPHY 4680 (3) Critical Thinking in Exercise Physiology

Covers specific exercise physiology topics such as cellular cause of fatigue and muscle soreness, heart disease, regulation of blood flow, diabetes, aging, training adaptations, exercise at high altitude, ergogenic aids and excitation-contraction of muscle. Department enforced prerequisite: IPHY 4650.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree majors only.

IPHY 4720 (4) Neurophysiology

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5720

Requisites: Requires prerequisite course of IPHY 3470 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree or Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

IPHY 4730 (3) Integrative Motor Control

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5730

Recommended: Prerequisites IPHY 3410 and IPHY 3470.

IPHY 4740 (3) Theory of Motor Skill Learning

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory, and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 5740

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 4850 (1) Honors Thesis Seminar

To be taken during the final academic year prior to graduation. Consists of a lecture component on Honors thesis writing and defense, as well as a seminar component where Honors candidates present their thesis research in a practice defense talk.

Recommended: Prerequisite IPHY 3700, minimum 3.3 GPA and a declared IPHY major and approval by departmental honors committee.

Grading Basis: Pass/Fail

IPHY 4860 (1-6) Independent Study: Undergraduate

Students may register for more than one section per term.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

IPHY 4870 (1-3) Honors Thesis

Department enforced prerequisites: IPHY 2800 and IPHY 3700.

Additional Information: Arts Sciences Honors Course

IPHY 4890 (3) Community-Based Primary Health Care

Introduces models of Community-Based Health Care (CBPHC), relevant research regarding the models and methods of implementation in rural low resource settings. This 3 week summer global seminar in Nicaragua also includes public health data collection in a rural area in conjunction with local health promoters. Provides students with practical skills in the implementation of CBPHC in rural low resource settings.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite GEOG 3692.

Grading Basis: Letter Grade

IPHY 4930 (1-6) Internship

Provides an opportunity for field/laboratory work in a variety of different settings. Consult with faculty for approval. Department enforced prerequisite: completion of at least two of the major core classes.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 4940 (1-6) Application for Clinical Internship

Provides an opportunity for clinical experience in a clinic or hospital setting with which the University has an established Affiliation Agreement. Consult with faculty for approval. Department enforced prerequisite: completion of two 3000-level courses.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IPHY 5010 (1) Graduate Student Research Forum

Special topics spanning the broad scope of integrative physiology are covered in a seminar-style format. Presentations by current IPHY faculty are augmented by graduate student presentations of thesis and dissertation work.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 5100 (2) Colloquium in Integrative Physiology

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5102 (2) Introduction to Physiology Genomics

Covers recent developments in genomics: a body of revolutionary new approaches that deal with the analysis of all the DNA sequence in the cell. Relies on a genomics text and student presentation/discussion aided by a study guide.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

Recommended: Prerequisite IPHY 5200.

IPHY 5200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4200 and PSYC 5200

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

IPHY 5262 (3) Application of Bioinformatics and Genomics

Explore public websites, databases, and bioinformatic tools that can be used for analysis of genomic data. These include NCBI Resources, genome databases, gene expression databases, tools for nucleotide and algorithms analyses and protein databases. Students develop a mini-grant proposal that is required to incorporate use of some of the tools covered.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

Recommended: Prerequisite IPHY 5200 and IPHY 5102.

IPHY 5300 (3) Statistical Genetics for Complex Traits

Focuses on the methods of mapping complex disease genes in both population and family-based samples. Topics include both linkage and association analyses of qualitative and quantitative phenotypes.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5440 (4) Endocrinology

Introduces mammalian endocrine system. Provides a thorough analysis of chemical communication by hormones and related bioregulators with emphasis on the major endocrine systems such as the thyroid, gonad, pituitary and the brain. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab).

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4440

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5550 (3) Exercise Biochemistry

Examines the underlying biochemical mechanisms that are responsible for the physiological adaptations to short- and long-term dynamic exercise including carbohydrate, fat, and protein metabolism. The interaction of key biochemical alterations as it relates to disease (diabetes, obesity, and aging) and exercise will be addressed.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

Recommended: Prerequisite IPHY 4650 and one year of general chemistry (lecture + lab).

IPHY 5580 (3) Sleep Physiology

Describes the physiology and neurobiology of sleep and impact of sleep, sleep deprivation, and sleep disorders on immune, endocrine, cardiovascular, respiratory, and neural systems, as well as examines changes in sleep across the life span. The integrative nature of sleep and circadian rhythms in normal

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 5600 (3) Immunology

Studies the immune system, a multi-cellular system that functions to protect us from disease. Introduces concepts associated with the development and function of individual cells of the immune system (T-cells, B-cells, neutrophils, dendritic cells, macrophages), as well as their integrative roles in physiology and host defense.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4600

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

Recommended: Prerequisites one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab); IPHY 3470.

IPHY 5720 (4) Neurophysiology

Explores the function of the nervous system, including how the properties of neurons influence nervous system activity, how the nervous system controls the activity of muscles and how the sensory effects of muscle activity influence the function of the nervous system. Department enforced prerequisites: one year of general biology (lecture + lab) and one year of general chemistry (lecture + lab), IPHY 2800 (or equivalent); IPHY 3410.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4720

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Grading Basis: Letter Grade

IPHY 5730 (3) Integrative Motor Control

Investigates human motor control by integrating concepts from exercise physiology, biomechanics, and sport psychology. Applications are made to clinical and educational exercise contexts.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4730

Recommended: Prerequisites IPHY 3410 and IPHY 3470.

IPHY 5740 (3) Theory of Motor Skill Learning

Offers a critical analysis of motor learning theories, including Adam's closed loop theory, Schmidt's schema theory and the influence of contextual interference on learning and performance. Also covers feedback and practice organization. Projects and presentations required.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4740

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

IPHY 5800 (4) Advanced Statistics and Research Methods in Integrative Physiology

Introduces advanced statistical techniques important for analyzing data rising in biomedical research, including physiology. Statistical reasoning will be emphasized through problem solving and applications using statistical software packages.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

Recommended: Prerequisite IPHY 2800.

IPHY 5840 (1-6) Graduate Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6010 (1-3) Seminar

Presents special topics in integrative physiology.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6650 (3) Cellular Cardiovascular Physiology

Focuses on the cellular control of cardiac and smooth muscle contraction, at rest and in response to acute and chronic exercise. Addresses certain pathophysiological and physiological adaptive mechanisms.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Recommended: Prerequisite IPHY 4650.

IPHY 6660 (3) Locomotion Energetics and Biomechanics

Critiques and discusses both classic and cutting edge scientific research in the area of terrestrial locomotion.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Recommended: Prerequisites IPHY 4540 and IPHY 4650.

IPHY 6670 (2) Hypothesis Testing in Locomotion Biomechanics

Focuses on the scientific process including formulating and testing hypotheses in studies of locomotion. Students analyze primary articles to determine whether the studies tested hypotheses and to generate new hypotheses that logically follow from previous studies.

Requisites: Restricted to Integrative Physiology (IPHY) or Integrative Physiology Concurrent Degree (C-IPHY) graduate students only.

IPHY 6680 (3) Matlab for Physiological and Biomechanical Research

Introduces Matlab programming skills needed to write and modify programs for data acquisition and analysis, statistics, plotting, and simulation.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6830 (3) Professional Skills for the Research Scientist

Discusses grant and manuscript writing, scientific presentations, peer-review, setting up/directing a research laboratory, research ethics, mentoring and other professional skills.

Requisites: Restricted to Intergrative Physiology (IPHY) doctoral students only.

IPHY 6840 (1-3) Research Project

Involves a scholarly investigation of a selected topic using literature and/or experimental techniques. Advisor required.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 6940 (1) Master's Degree Candidate

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

Grading Basis: Pass/Fail

IPHY 6950 (1-6) Master's Thesis

Must have 4 credit hours and may be repeated up to 6 total credits.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) graduate students only.

IPHY 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Requisites: Restricted to Intergrative Physiology (IPHY) doctoral students only.

Intermedia Art, Writing, & Performance (IAWP)

Courses

IAWP 6000 (3) Introduction to Practice-Based Research

Introduces students to practice-based research methods in intermedia art, writing and performance.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

IAWP 6100 (3) Theory and Practice of Doing

Introduces students to the theory of doing and making. Guiding questions include: what does it mean to place "doing" at the center of one's research agenda? What does it mean to do hands-on work in an art/design studio, a digital humanities lab, a media lab, a media archaeology lab, a makerspace or a hackerspace?

Equivalent - Duplicate Degree Credit Not Granted: ENGL 5529

Grading Basis: Letter Grade

IAWP 6200 (3) Intermedia Collaboratory

Collaborative studio course in which students focus on emerging practices in intermediate art, writing and performance while collaboratively building art, writing and/or performance projects that are presented to the community as public events and programs including exhibitions, publications and performances.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

IAWP 6700 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

IAWP 6800 (3) Intermedia Seminar

Focuses on intermedia arts, writing and performance as they relate to digital media, communication and information.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

Grading Basis: Letter Grade

IAWP 6871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

IAWP 7841 (1-3) Independent Study

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

IAWP 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

IAWP 8991 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 40.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

International Affairs (IAFS)

Courses

IAFS 1000 (4) Global Issues and International Affairs

Introduces the student to the international affairs program. The course examines political and economic development in several countries in many different world regions. Examines historical trends and development as well as current political and economic issues.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Asia Content

IAFS 3000 (3) Special Topics in International Affairs

Junior or senior level umbrella seminar spanning a variety of topics relevant to the study of international affairs. Subjects addressed under this heading vary according to student interest and faculty availability.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) or Political Science (PSCI) majors only.

IAFS 3010 (3) Islam, Geopolitics and Society: Gender, Identity and Place

Examines Islam, geopolitics and society in various locations throughout the globe, such as Afghanistan, Egypt, France, Germany, India, Indonesia, Iran, Iraq, Ireland, Israel/Palestine, Morocco, Pakistan, Saudi Arabia, Turkey, Yemen, the UK and the US. Addresses issues of gender, identity and place to illustrate the complexity and diversity of social experiences within the milieu of Islam and geopolitics.

Grading Basis: Letter Grade

IAFS 3500 (3) French Connections: Contemporary France and America in Historical Context

Faculty-led Global Seminar, based in Bordeaux, France provides an opportunity to compare French history and contemporary culture, economy, and culture to that of the United States. Lectures in Boulder and Bordeaux are supplemented by interactions with officials, scholars, business leaders, interest groups, and organizations in France. Offered through Study Abroad.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4190

Additional Information: Arts Sci Core Curr: Historical Context

IAFS 3520 (6) Global Seminar: Justice, Human Rights and Democracy in Israel

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4302

Recommended: Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Asia Content

IAFS 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3530 and RLST 3530

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

IAFS 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3600 and GSLL 3600

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Human Diversity

IAFS 3610 (3) Topics in International Affairs and Jewish Studies

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3610

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IAFS 3621 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4481 and RUSS 5481

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

IAFS 3630 (3) Radical Nationalism in Contemporary Northern Europe

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film.

Equivalent - Duplicate Degree Credit Not Granted: SCAN 3301

Additional Information: Arts Sci Core Curr: Ideals and Values

IAFS 3631 (3) Arctic Society and Culture

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

Equivalent - Duplicate Degree Credit Not Granted: SCAN 3631

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

IAFS 3640 (3) Data Analysis for Global Environmental Affairs

Develops data analysis techniques for global environmental data including demographic, economic, agricultural, fisheries and energy sectors. Designed to support the development of basic and intermediate data analysis skills for students in the Global Environmental Affairs certificate program. Includes hands-on exploration of up-to-date global data sets from a variety of sources. Fulfills the application requirement for the ENVS major.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3640

Grading Basis: Letter Grade

IAFS 3650 (3) History of Arab-Israeli Conflict

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3650

Requisites: Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

Recommended: Prerequisite HIST 1308 or HIST 1828 or JWST 1828.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

IAFS 4500 (3) The Post-Cold War World

Capstone course for international affairs majors. Examines the ways in which the end of the Cold War, the collapse of failed states, and the rise of global terrorism changed the world. Studies how peoples, governments and nongovernmental organizations face new social, political, economic and security challenges in an era of globalization. Includes discussion, oral reports, critical book reviews, and research papers.

Requisites: Restricted to students with 87-180 credits (Senior) International Affairs (IAFS) majors only.

IAFS 4800 (3) Honors Seminar in International Affairs

Directed research course tailored to the particular research interests of the students enrolled. Devoted to research methodology and the development of students' research. Department enforced prerequisite: overall 3.30 GPA and IAFS 3.40 GPA.

Additional Information: Arts Sciences Honors Course

IAFS 4810 (3) Honors in International Affairs

Continuation of IAFS 4800. Students complete original research begun in the fall and write, defend their honors thesis and meet regularly with the instructor.

Requisites: Requires prerequisite course of IAFS 4800 (minimum grade C-).

Additional Information: Arts Sciences Honors Course

IAFS 4900 (1-6) Independent Study in International Affairs

Provides an opportunity to earn academic credit for learning outside the formal class structure. Students interested in doing in-depth research propose a research project to a faculty sponsor and then work closely with that person to produce a piece of original research. Department enforced prerequisite: restricted to students with 57-180 credits (Juniors or Seniors), GPA of 3.00 or better, grade of C or better in all lower-division courses, and at least 6 upper-division courses.

Repeatable: Repeatable for up to 6.00 total credit hours.

IAFS 4930 (3-6) Internship in International Affairs

Working individually under the guidance of a public or private organization, students are assigned to projects selected for their academic suitability. Written assignments occur throughout the semester.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) International Affairs (IAFS) majors only.

International Business Cert (INBU) Courses

INBU 2800 (3) Special Topics

Variable topics in international business drawing from a variety of business disciplines, industry trends and best practices.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Leeds School of Business majors only.

INBU 3101 (3) Operations Management Global Seminar

Examines concepts, tools and techniques used in the management of operations. Focuses on how firms add value and compete with high quality products and efficient services. Emphasizes the use of models for designing and improving operations to deliver product and services. Based on an experiential learning approach that balances lecture with business visits to an international location. Credit can be granted for this course and MGMT 3100, but only one will count towards the major.

Requisites: Requires a prerequisite course of BCOR 1025 (minimum grade D-). Restricted to Business majors only.

Grading Basis: Letter Grade

INBU 3300 (3) International Business and Management

This survey course takes a broad and comprehensive perspective on managing and operating in a rapidly growing global economy. Explores regional and national approaches to international management, including trade practices, country penetration strategies, international finance and accounting, marketing across cultures, global service and manufacturing operations, cultural and legal differences, ethical and sustainability issues and global competitive strategy.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) or International Affairs (IAFS) majors with 52-180 units completed.

Additional Information: Departmental Category: Asia Content

INBU 3301 (3) Doing Business in China

This survey course examines how to conduct international business in China. Explores all the major functional areas of international business as they apply to U.S. companies in China: marketing, human resources, operations, finance, accounting, government relations, cultural and legal differences, ethical and sustainability issues, and global competitive strategy. Open to non-business students.

Requisites: Restricted to students with 52-180 units completed.

Additional Information: Departmental Category: Asia Content

INBU 3333 (3) Leading and Managing Across Cultures in Northern Europe

Explains the "whats" and the "whys" of cultural differences in international management as it covers leadership, motivation, communication, planning, decision making process, change, structure, organizational culture, strategy, negotiation, team work and international assignments in a multicultural environment and in a multidisciplinary context from the perspective of practicing managers. Students will meet with international business professionals from European companies.

Equivalent - Duplicate Degree Credit Not Granted: BUSM 3006

Requisites: Restricted to students with 52-180 units completed.

INBU 3450 (3) International Marketing

Describes the economic, geographic, political and social forces that have shaped and continue to define global markets. Examines topics critical to success in international markets, including assessment of a firm's international capabilities, techniques for gauging the potential of international markets, international segmentation approaches and alternative arrangements for entering foreign markets. Compares and contrasts product, price, distribution, logistics, promotion and research decisions made in global versus domestic markets. Introduces students to financial arrangements characteristic of international marketing, including exchange rates and controls, balance-of-payment principles, import licensing agreements and tariffs.

Equivalent - Duplicate Degree Credit Not Granted: INBU 5100

Requisites: Requires prerequisite class of BCOR 2001 or BCOR 2400 (minimum grade D-). Restricted to Business (BUSN), Advertising (ADVT) or International Affairs (IAFS) majors with 52-180 units completed.

INBU 4151 (3) International Operations in Hong Kong

Compares systems of production/operations management in the United States with those in Asia. Contrasts various regional and national approaches to business, quality management, labor practices, management styles, international competitiveness, productivity, distribution systems, trade practices, and strategies for penetrating foreign markets. Examines different sociocultural environments, government-business relationships, banking industries, operations strategies, and the potential for transferring industrial management practices and techniques between countries.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

INBU 4200 (3) International Financial Management

Examines the financial policies and problems associated with firms doing business internationally. Topics include the foreign exchange environment, country risk, managing foreign exchange exposure, international working capital management, international capital budgeting, and international financial markets.

Requisites: Requires prerequisite courses of BCOR 2002 or BCOR 2200 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

Additional Information: Departmental Category: Asia Content

INBU 4825 (1-6) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in International Business Entrepreneurship.

Requisites: Restricted to students with 57-86 credits (Junior).

INBU 4900 (1-12) Independent Study

Department instructor required. Departmental form required.

INBU 4910 (3-6) Global Internship

Business programs must balance theory and practice in order to produce graduates who are not only proficient in the language of business, but also have hands-on experience in their areas of emphasis. Internships are an effective way of acquiring the practical experience that business graduates need. A global internship consists of a practical international experience that includes an academic component.

Requisites: Restricted to Business (BUSN) majors only.

Grading Basis: Letter Grade

INBU 4925 (6) Entrepreneurship and Empowerment in South Africa

The EESA program is broken into two main elements. The first element consists of workshop sessions that address various aspects of an entrepreneurial venture and the consulting experience. The second element involves the actual field experience in the form of consulting interventions. Students will consult with two entrepreneurs, evaluate their venture and implement tangible deliverables that make the biggest impact.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

INBU 5100 (3) International Business and Marketing

Describes the economic, geographic, political and social forces that have shaped and continue to define global markets. Examines topics critical to success in international markets, including assessment of a firm's international capabilities, techniques for gauging the potential of international markets, international segmentation approaches and alternative arrangements for entering foreign markets. Compares and contrasts product, price, distribution, logistics, promotion and research decisions made in global versus domestic markets. Introduces students to financial arrangements characteristic of international marketing, including exchange rates and controls, balance-of-payment principles, import licensing agreements and tariffs.

Equivalent - Duplicate Degree Credit Not Granted: INBU 3450

Additional Information: Departmental Category: Asia Content

INVST Community Studies (INVS)

Courses

INVS 1000 (4) Responding to Social and Environmental Problems Through Service Learning

By integrating theory with required community service, students explore how problems are shaped by cultural values and how alternative value paradigms affect the definition of problems in areas such as education and the environment. Students examine different approaches to solving problems and begin to envision new possibilities.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Departmental Category: Invst Community Studies

INVS 1513 (3) Civic Engagement: Using the Electoral Process as a Tool for Social Change

Designed to educate and inspire civic engagement primarily in the area of electoral politics. Examines various explanations of why people participate in the electoral process and whom they choose to support. Develops the practical skills necessary to participate successfully in the electoral arena. Through a service component, the course provides experience working on a campaign and mobilizing others to participate in the electoral process.

Additional Information: Departmental Category: Invst Community Studies

INVS 1523 (3) Civic Engagement: Democracy as a Tool for Social Change

Educates and inspires students for civic engagement by exploring democratic values and the rights and responsibilities of citizenship. Develops theoretical knowledge and practical skills for participating in a diverse democratic society, especially at the state level, through analyzing legislative issues, making policy recommendations, and advocating for change.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: United States Context

Departmental Category: Invst Community Studies

INVS 2005 (2) Puksta Scholars Practicum

Integrates critical reflection and community-based experiences for undergraduates in the Puksta Scholars Program. This two-semester course will focus on the development of knowledge, attitudes and skills to productively engage the public realm. Examines topics includes ethical leadership, frameworks for social action, project design and participatory action research.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

INVS 2919 (3) Renewing Democracy in Communities and Schools

Examines concepts of activism, citizenship, democracy, power, and diversity through classroom discussions and participation in a local K-12 school's Public Achievement project. Through community-based partnerships, students will develop leadership skills; dialogue with diverse groups of people; identify multiple perspectives around controversial issues; and learn to use research and writing to articulate public problems and advocate for their solutions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 2919

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Invst Community Studies

INVS 3000 (3-4) Innovative Approaches to Contemporary Issues through Service Learning

Explores creative approaches for solving complex social and environmental issues, with a focus on peace and population. Students analyze the root causes of issues in theoretical and historical contexts, and develop their understanding of effective and innovative approaches to change. This course has a requirement of community service.

Recommended: Requisite upper-division status.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Invst Community Studies

INVS 3041 (3) Self and Consciousness

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3041

Requisites: Requires prerequisite courses of SOCY 1001 and SOCY 3001 or SOCY 3011 (all minimum grade D-).

Additional Information: Departmental Category: Invst Community Studies

INVS 3100 (3-4) Multicultural Leadership: Theories, Principles and Practices

Focuses on leadership theories and skills necessary for effectiveness in multicultural settings. Students gain understanding of traditional and culturally diverse approaches to leadership and change through comparative analyses of Western and non-Western theories and practices. Community service required.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3201

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Invst Community Studies

INVS 3302 (3) Facilitating Peaceful Community Change

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3302

Additional Information: Departmental Category: Invst Community Studies

INVS 3402 (3) Implementing Social and Environmental Change

Examines grassroots innovation as a means for creating comprehensive, solution-based strategies to address social and environmental problems. Students develop an understanding of the root causes of problems, identify how changes are initiated at the grassroots level, and learn the theory and practice of effective and responsible change efforts.

Additional Information: Departmental Category: Invst Community Studies

INVS 3931 (3) The Community Leadership Internship, Part 1

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, admission into INVST CLP.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Invst Community Studies

INVS 3932 (3) Community Leadership Internship, Part 2

Develops students' competencies as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community supervisor, students learn organizational leadership skills by serving as volunteer staff members at community-based organizations. Required requisite, membership in INVST CLP.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of INVS 3931 (minimum grade D-).

Additional Information: Departmental Category: Invst Community Studies

INVS 4302 (3) Critical Thinking in Development

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade, and democratization.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 4732

Requisites: Requires prerequisite courses of PSCI 2012 or IAFS 1000 and ECON 2010 and 2020 (all minimum grade D-).

Recommended: Prerequisite one upper-division PSCI course.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Invst Community Studies

INVS 4402 (3) Nonviolent Social Movements

Explores theories of democracy and development in relation to movements for nonviolent social change. Focuses on means and ends, spirituality, leadership, decision-making, civil society, cooperative economics, ecology and decentralized powers.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Sociology (SOCY) or Political Science (PSCI) majors only.

Additional Information: Departmental Category: Invst Community Studies

INVS 4919 (1-2) Teaching Social Justice for Public Achievement

Participate as teaching assistants for the practicum course INVS 2919. Focusing on the issues of democratic education, diversity, social justice and social change, students learn how to foster undergraduates' skills as experiential educators.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of INVS 2919 (minimum grade B).

INVS 4931 (1-6) Community Leadership in Action, Part 1

Develops students' expertise as community leaders. Under the supervision of an instructor and a community advisor, students design a community-based project.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of INVS 3931 and INVS 3932 (all minimum grade D-).

Recommended: Prerequisite admission to INVST CLP.

Additional Information: Departmental Category: Invst Community Studies

INVS 4932 (1-6) Community Leadership in Action, Part 2

Develops students' expertise as community leaders working for a just and sustainable world. Under the supervision of an instructor and a community advisor, students learn organizational and leadership skills by designing, implementing and evaluating a community-based project. First-hand experience provides students with a deepened understanding of the complex issues facing humanity, and competence with solution-based strategies.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of INVS 4931 (minimum grade D-).

Additional Information: Departmental Category: Invst Community Studies

INVS 4999 (1-4) Teaching Social Justice

Students participate in a service-learning practicum under the supervision of a Community Studies instructor. They explore teaching strategies for implementing concrete educational goals. Focusing on the issues of social justice and social change, they learn how to encourage higher levels of creativity and analysis among students.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Invst Community Studies

Italian (ITAL)

Courses

ITAL 1010 (5) Beginning Italian 1

The four skills of listening, speaking, reading, and writing are progressively developed in a predominantly oral presentation. Grammatical concepts are explained and practiced through dialogues, written exercises, and conversations. The cultural focus is on the personal world and life of students.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Italian

ITAL 1020 (5) Beginning Italian 2

Continuation of ITAL 1010, with more difficult grammatical concepts explored. The cultural focus shifts to social and civic areas.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1050

Requisites: Requires a prerequisite course of ITAL 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Italian

ITAL 1050 (5) Fast-Track Italian

Two semesters of beginning Italian in one, for students who have studied other languages or have had previous exposure to Italian.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 1010 or ITAL 1020

Grading Basis: Letter Grade

Additional Information: Departmental Category: Italian

ITAL 1300 (3) La Dolce Vita: Why the Humanities Matter, Italian Style

Introduces students to a critical appraisal of the Humanities in their world. Because the Humanities were rediscovered in the late Middle Ages in Italy, the course explores the Humanities from an Italian-centered perspective, though it broadens the scope of its analysis to make this perspective relevant for students who come from a variety of cultures and backgrounds.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Italian

ITAL 1400 (3) Medieval/Renaissance Women Writers in Italy and France
Introduces major literature through close readings of women's writings in their historical context. Offers a general introduction to women's status and roles in Italy and France. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FREN 1400

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Human Diversity
Departmental Category: Italian

ITAL 1500 (3) That's Amore: Introduction to Italian Culture

Introduces students to representations of Italian society that have persisted through the ages. The course readings allow students to better understand how certain stereotypes about Italian society (e.g., Latin lover, Mafia) were born and persist in the present. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Contemporary Societies
Departmental Category: Italian

ITAL 1600 (3) Strategies of Fear: Introduction to Italian Fantastic Literature

Traces the development of the fantastic theme in Italian Literature from its origins (late nineteenth century) to contemporary times. Analyzes the modes of reception and appropriation of non-Italian gothic and fantastic narrative traditions through which Italian writers have subverted the national literary model proposed by realist narrative. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 2110 (3) Intermediate Italian Reading, Grammar, and Composition 1

Enhances the skills learned in the first-year course and develops greater fluency in understanding and speaking. More emphasis is placed on reading and writing through the use of activities featuring cultural themes that present a realistic portrait of contemporary Italy. Taught in Italian.

Requisites: Requires a prerequisite course of ITAL 1020 or ITAL 1050 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages
Arts Sci Core Curr: Foreign Language
Departmental Category: Italian

ITAL 2120 (3) Intermediate Italian Reading, Grammar, and Composition 2

Continuation of ITAL 2110. Some reading in Italian literature and culture with considerable practice in writing and speaking Italian. Fulfills the Graduate School language requirement for the Ph.D.

Requisites: Requires a prerequisite course of ITAL 2110 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 2130 (3) Introduction to Literary Analysis

Increases student's ability to read and analyze literary texts by improving vocabulary and terminology. Students read short stories, essays, short plays, and poems to acquire critical skills and improve expression of opinions and arguments in Italian. Taught in Italian.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3015 (3) Advanced Composition 1

Teaches students to write in Italian in a variety of genres, focusing on the creative aspects of writing. Exercises and themes are drawn primarily from current events and culture (i.e., blogging, journaling, essays and films), but also allows students to develop their critical skills in other areas.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3025 (3) Advanced Composition 2: Introduction to Literary Writing

Introduces students to complex forms of writing within Italian studies. Focuses on the analysis of literary genres (e.g., autobiography, essays, short stories) through a step-by-step process that allows students to craft advanced arguments in Italian. Studies will read Italian literary texts and write and revise in workshop format (e.g., peer review, collaborative assignments).

Requisites: Requires a prerequisite course of ITAL 3015 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Italian

ITAL 3030 (3) Storia dell'arte: Advanced Composition/Conversation 3

Improves vocabulary and fluency in spoken Italian, and competence and confidence in correct and more sophisticated written Italian through the study of the history of Italian art. Exercises and themes focus on Italian Classical, Medieval, Renaissance, and Modern Art.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3040 (3) Italian Conversation Through Cinema

Taught in Italian, the course covers various topics of Italian Cinema from WWII to the present. Focus is on periods, genres, themes, and auteur/directors. Emphasis on review of language structures previously learned and acquisition of new vocabulary to enable students to discuss different aspects of Italian culture, in Italian.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3140 (3) Readings in Italian Literature-20th and 21st Century

Covers a selected reading of major texts, prose, and poetry of 20th and 21st-century literature. Emphasizes critical reading and analysis of modern and contemporary Italian literature in its literary and historical context. Taught in Italian.

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3150 (3) Readings in Italian Literature-19th Century

Introduces students to 19th century literary history through a selected reading of major texts, prose, and poetry. Emphasizes critical reading and analysis of Italian literature in its literary and historical context. Taught in Italian.

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 3160 (3) Readings in Italian Literature--Medieval and Renaissance
Covers a selected reading of major texts, prose, and poetry of Medieval and Renaissance literature. Emphasizes critical reading and analysis of texts in their literary and historical context. Taught in Italian.

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4010 (3) Problems in Translation, Advanced Grammar, and Stylistics 1

Emphasizes practice in translating varying types of prose from Italian into English and English into Italian.

Requisites: Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4030 (3) Contemporary Italian Culture, Politics, and the Media

Serves as an introduction to the study of the effect that politics and the media have in shaping Italian culture. Makes use of the World Wide Web for instruction. Taught in Italian. Familiarity with Internet helpful.

Requisites: Requires a prerequisite course of ITAL 2130 or ITAL 3015 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4040 (3) Business Italian Style

Provides an introduction to the Italian way of conducting business, with a close view on the company and its world through learning marketing and producing a real company project for the market. Analyzes topics of international marketing and trade using Italian and American economics websites. Focuses on building cross-cultural bridges between the U.S. and Italy to have smoother business relationships and enable students to participate more easily in joint international working teams.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4140 (3) The Age of Dante: Readings from The Divine Comedy

Focuses on close reading of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4145 or ITAL 4147 or HUMN 4140

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4145 (3) The Age of Dante in Italian

Focuses on close readings of Dante's poetry with emphasis on the intellectual, religious, political, and scientific background of the medieval world. Taught in Italian.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4140 or ITAL 4147 or HUMN 4140

Requisites: Requires prerequisite course of ITAL 2130 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4147 (3) Visualizing Dante's Inferno: A Global Seminar in Florence Italy

Focuses on close reading of Dante's Inferno. Examines the specific sites and art in Florence and nearby cities that Dante references in the Inferno, as well as visual representations of Hell created both before and after Dante's poem. Taught in English. Offered through the CU Study Abroad Program.

Equivalent - Duplicate Degree Credit Not Granted: ITAL 4140 or ITAL 4145 or HUMN 4140

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4150 (3) Boccaccio's Decameron: Tales of Sex and Death in the Middle Ages

Studies Boccaccio's masterpiece, the Decameron, as emblematic of the post-Black Plague era in the late Middle Ages. Focuses on the art of storytelling through gendered perspectives to portray the complexity of the Middle Ages. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4150

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Human Diversity
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4160 (3-5) Italian Literature Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Italian

ITAL 4170 (3) Italian Literature Special Topics

Topics vary each semester. Consult the online Schedule Planner for specific topics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Italian

ITAL 4200 (3) Topics in Italian Culture and Civilization from the Origins through the Renaissance

Taught in English. Topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Italian

ITAL 4250 (3) History of Modern Italy

Examines the major historical, economic and social factors that have shaped the identity of modern Italy, from the enthusiasm of young patriots during Italy's unification in the 1860s to the discontent and domestic terrorism of the 1960s-1980s. Focuses on Mussolini, the Fascist movement and on World War II, as well as the changing role of women. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4313

Additional Information: Departmental Category: Italian

ITAL 4280 (3) Topics in Italian Cinema

Examines different aspects of Italian cinema from the origins of neorealism to the present. May focus on a particular director, the culture of a specific period, or certain themes (e.g., the representation of women, the relationship between cinema and literature, or socio-aesthetic movements like Futurism or Fascism). Taught in English.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Italian

ITAL 4290 (3) Italian Culture Through Cinema

Examines the representations of Italian culture through its cinema. Focusing especially on post-World War II cinema, examines how Italian filmmakers have portrayed Italian history and specific aspects of its culture (i.e., Fascism, post-war reconstruction, the Mafia, patriarchy) in the past 50 years. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Italian

ITAL 4300 (3) Multiculturalism in Italy

Focuses on multiculturalism and difference in contemporary Italian society. Readings assigned explore the experience and co-existence of ethnic and religious minorities in Italy. Students will study how specific minorities live in a major Western-European country and will investigate the connotations that the concept of 'multiculturalism' takes in the Italian context.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Italian

ITAL 4350 (3) From Wops to Dons to Movers and Shakers: The Italian-American Experience

Exposes students to the history of Italian immigration to the United States. By studying how Italians and Americans negotiated different ideas concerning identity, traditions and community, it helps students understand how Italians transformed themselves from a despised and marginalized minority into active participants in the success of the United States in the 20th and 21st centuries. Taught in English.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Italian

ITAL 4500 (4) Italian Theatre

Using theatre as a medium, this course helps students attain a higher level of proficiency in spoken and written Italian. Study of Italian theatre is integrated with acting activities and pronunciation exercises. Culminates in the production of a play. Performance is in Italian and the students participate in the writing of the script. Taught in Italian.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4600 (3) Once Upon a Time in Italy

Examines the evolution of the Italian fairy tale from the 1500s to the 2000s in literature, theater, and film. Considers the tales and their authors in their social-historical context.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Italian

ITAL 4730 (3) Italian Feminisms: Culture, Theory, and Narratives of Difference

Studies Italian women writers, artists and filmmakers. Literary and visual texts are analyzed in dialogue with readings of leading Italian gender theorists. Italian history and culture is reread by following the development of a discourse about women. Taught in English; readings in Italian for Italian majors.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4730

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Italian

ITAL 4840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Italian

ITAL 4930 (1-3) Languages Internship for Professions

Offers opportunities to use Italian skills in service to various sectors of the community, including private industry, government, and education.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of ITAL 2120 (minimum grade C-).

Additional Information: Departmental Category: Italian

ITAL 4980 (3) Italian Senior Honors Thesis

The senior honors thesis is a 40 to 45 page original research paper, written in Italian, and constitutes a requirement for graduating with departmental honors.

Requisites: Requires a prerequisite course of ITAL 3015 (minimum grade C-).

Additional Information: Arts Sciences Honors Course
Departmental Category: Italian

ITAL 4990 (3) Senior Seminar

Preparation of a 15-page research paper in Italian presented to two members of the faculty and defended orally in class.

Requisites: Requires a prerequisite course of ITAL 3015 (minimum grade C-).

Additional Information: Departmental Category: Italian

Japanese (JPNS)

Courses

JPNS 1010 (5) Beginning Japanese 1

Provides a thorough introduction to modern Japanese, emphasizing speaking, listening, reading, and writing in a cultural context.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 1012 (4) Introduction to Japanese Civilization

An interdisciplinary introduction from ancient to modern times. Arts, literature, politics, social relations, religion, and material culture are studied in terms of significant themes and ideas pertaining to the civilization of Japan. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 1020 (5) Beginning Japanese 2

Continuation of JPNS 1010.

Requisites: Requires prerequisite course of JPNS 1010 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 1051 (3) Masterpieces of Japanese Literature in Translation

Surveys Japanese thought and culture through careful reading and discussion of selected masterworks of Japanese literature in translation. Texts include significant works of poetry, fiction, drama, diaries, and essays, from ancient times to the present. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 2110 (5) Intermediate Japanese 1

Continued study of oral and written modern Japanese in a cultural context.

Requisites: Requires prerequisite course of JPNS 1020 (minimum grade C).

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 2120 (5) Intermediate Japanese 2

Continuation of JPNS 2110.

Requisites: Requires prerequisite course of JPNS 2110 (minimum grade C).

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 2441 (3) Japanese Culture through Film and Anime

Examines 20th century Japanese culture through cinematic and animated films. Studies films by Ozu, Kurosawa, Mizoguchi, and contemporary animators Tezuka, Miyazaki, and Kon Satoshi. Considers cultural issues raised in film and anime in light of modern Japanese history and literature. Requires no knowledge of Japanese. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 2811 (3) Heroes and the Supernatural: Word and Image in Old Japan

Examines the fusion of literary and visual arts in twelfth- to nineteenth-century Japan, focusing on illustrated handscrolls and narrative paintings. Students will explore tales of monsters, samurai, fantastic journeys to other worlds, anthropomorphic animals, and the eighteenth- and nineteenth-century precursors of contemporary Japanese comics. This course seeks to analyze visual-literary texts in their historical contexts as both literature and art. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3110 (5) Advanced Japanese 1

Enhances student competence and performance in Japanese language in a holistic and integrative manner.

Requisites: Requires prerequisite course of JPNS 2120 (minimum grade C).

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 3120 (5) Advanced Japanese 2

Continuation of JPNS 3110. Enhances student competence and performance in Japanese language in a holistic and integrative manner.

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 3200 (3) Adv Wrtg Topics on Chinese & Japanese Literature and Civilization

Provides an introduction to the academic study of Chinese and Japanese literature and culture with a focus on writing skills in English through a survey of standard academic writing conventions. Review and assessment of selected textual materials, class presentation, critique, and revision. Recommended for Japanese majors and minors. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: CHIN 3200

Requisites: Restricted to students with a minimum of 45 units.

Additional Information: Arts Sci Core Curr: Written Communication

Departmental Category: Chinese Courses in English

Departmental Category: Asia Content

JPNS 3311 (3) Japanese Colonial and Transnational Literature

Explores the development of Japanese and colonial identities in literature produced in and about Japan's colonies during the first half of the 20th century. We will read works written during and about the Japanese empire by Chinese, Japanese, Korean, Okinawan and Taiwanese writers looking at the different representations of empire. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

JPNS 3321 (3) Fantasy and Sci-Fi in Japanese Literature, Film and Culture

Explores the development of Japanese science fiction and fantasy literature produced in the past century. We will read works written by writers such as Abe Kobo, Hoshi Shin'ichi, Kurahashi Yumiko, Ueda Sayuri and Project Ito. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

JPNS 3331 (3) Business Japanese

Designed to teach Japanese with emphasis on using Japanese for professional purposes. The course aims to foster the skills and the knowledge of effective cross-cultural and interpersonal communication in Japanese and to develop intercultural competence in business contexts.

Requisites: Requires prerequisite course of JPNS 2120 (minimum grade C).

Recommended: Prerequisite JPNS 3110.

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 3511 (3) From Rebellion to Calamity: Contemp Japanese Lit in Transl

Explores post-1945 Japanese literature through close reading of prose fiction (including SF, mystery, horror, e-novel and cell-phone novel genres), poetry, visual narratives (manga) and critical essays. Texts will be considered in historical and cultural contexts, with attention to their relationship to traditional arts and global trends. Taught in English.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese Courses in English

JPNS 3811 (3) Love, Death, and Desire: Classical Japanese Literature in Translation

Surveys the major works and authors of classical Japanese literature, both poetry and prose, from the earliest historical records and literary anthologies through the Heian period (784-1185). Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3811

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3821 (3) Monsters, Monks, and Mayhem: Medieval Japanese Literature in Translation

Surveys the major works and authors of medieval Japanese (poetry, prose, and drama) from the Kamakura and Muromachi periods (1185-1600). Taught in English.

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3831 (3) The Floating World of Play and Passion: Early Modern Japanese Literature in Translation

Surveys the major works, authors, and genres of literature from the Tokugawa through Meiji periods in their historical and cultural contexts.

Attention is given to various approaches of literary analysis and interpretation. Taught in English.

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3841 (3) Tradition and Transgression: Modern Japanese Literature in Translation

Surveys the major works, authors and genres of literature from the late Meiji period and 20th century in their historical and cultural contexts.

Attention is given to various approaches of literary analysis and interpretation. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3841

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3851 (3) Studies in Japanese Popular Culture

Introduces aspects of Japanese popular culture from the early 1990s economic collapse until the present through a variety of artistic mediums including manga, anime, literature, live-action cinema, video gaming, music, and the visual arts. Taught in English.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3861 (3) Imagining the Samurai in Japanese Literature and Culture

Explores the rich history of the imagination of the samurai in Japan, across multiple genres of fiction, poetry, drama, visual art, and cinema, from earliest times to the present. Attention is given to the varied meanings the image of the samurai has held at different historical moments, and to contrasts between the representations of the realities of samurai life. Taught in English.

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3871 (3) Horror and the Macabre in Japanese Literature, Film, Culture

Explores Japanese horror texts from both the pre-modern and modern eras in a variety of genres, including the monogatari, kaidan, kabuki, contemporary horror fiction, film and anime. Texts will be considered in historical and cultural context with attention being given to interactions with and within popular culture. Taught in English.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3881 (3) Environment, Nature and Disaster in Japanese Literature and Culture

Explores the significance of the environment, nature and disaster in Japanese literature and culture through readings in a variety of genres, including fiction, essay, poetry, sci-fi, film and anime. Attention will also be given to environmental/ecological issues, such as conservation, pollution, biodiversity and industrial development. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 3891 (3) Travel/Travel Writing in Japanese Literature and Culture

Explores selected Japanese literary and cultural texts that treat travel and travel writing, including short and long fiction, poetry, memoir, nonfiction, biography and travel commentary. Taught in English.

Recommended: Prerequisite JPNS 1051.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese Courses in English

Departmental Category: Asia Content

JPNS 4030 (3) Japanese Syntax

Deals with syntactic phenomena from five areas of Japanese grammar that cause the most difficulty for learners. Their characteristics are explored in forms and discursal functions that go beyond the explanations in basic, prescriptive grammars of Japanese. Department enforced prerequisite: JPNS 3120 or JPNS 4120 (minimum grade C) or instructor consent.

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4050 (3) Japanese Sociolinguistics: Japanese Language and Society

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5050 and LING 4050

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese

Departmental Category: Asia Content

JPNS 4070 (3) Second Language Acquisition of Japanese

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5070

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4080 (3) Kanji in Japanese Orthography

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5080

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4110 (3) Advanced Readings in Modern Japanese 1

Surveys a variety of material written in modern Japanese, including texts from literature, the social sciences, religion, and cultural history. Emphasizes content and style. Texts and selections vary from year to year.

Requisites: Requires prerequisite course of JPNS 3120 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4120 (3) Advanced Readings in Modern Japanese 2

Continuation of JPNS 4110. Texts and selections vary from year to year.

Requisites: Requires prerequisite course of JPNS 4110 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4150 (3) Japanese to English Translation: Theory and Practice

Introduction to a range of translation tasks and approaches, as well as to professional translation practices, ethics, methods and resources. Emphasis is on application, through translation of representative texts from Japanese into English in the fields of social science, humanities and the arts, journalism, and commerce.

Recommended: Prerequisite JPNS 3110.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4210 (3) Contemporary Japanese 1: Current Issues

Offers intensive review of Japanese language skills beyond the first eight semesters and cultivates further proficiency. Readings will be selected from a wide range of contemporary writings that reflect and represent issues in Japanese as well as global communities. Emphasizes all skills: reading, listening, writing, speaking and translation. Instructional technology is extensively integrated into the curriculum.

Requisites: Requires prerequisite course of JPNS 4120 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4300 (3) Open Topics: Readings in Japanese

Examines selected texts on a particular topic taught by regular or visiting faculty. Topics change each term. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4310 (3) Classical Japanese 1

Introduces reference tools for reading classical Japanese, and grammar, vocabulary, and use of scripts in premodern Japanese, focusing on the 10th century Taketori Monogatari and the 13th century Hojoki.

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Recommended: Prerequisites JPNS 3120 and JPNS 3811 and JPNS 3821.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4320 (3) Classical Japanese 2

Continuation of JPNS 4310. Surveys changes in Japanese literary language from the Nara (eighth century) to Meiji (late 19th century) periods. Attention given to changes in grammar, vocabulary, and use of scripts in premodern Japanese. Introduces representative works of classical Japanese literature of all periods.

Requisites: Requires prerequisite course of JPNS 4310 (minimum grade C).

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4400 (3) Critical Theory and Japanese Literature and Culture

Examines Japanese literary and cultural texts through the lens of specific theoretical paradigms as developed by Japanese and non-Japanese thinkers and academicians. Taught in English.

Recommended: Prerequisite JPNS 1051.

Additional Information: Departmental Category: Japanese Courses in English
Departmental Category: Asia Content

JPNS 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4950 (3) Honors Thesis

Additional Information: Arts Sciences Honors Course
Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 4980 (1) Practical Issues in Japanese Language Pedagogy

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language class. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning. Department enforced prerequisite: JPNS 4120 (minimum grade C) or equivalent.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 5980

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5010 (3) Bibliography and Research Methods

Introduces research materials on Japan in Japanese and Western languages, including bibliographic tools, style sheets, and library resources. Overview of secondary sources and publication outlets/methods of disseminating research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5020 (3) Methods of Teaching Japanese

Surveys pedagogical theory and methods for the teaching of Japanese as a second language, including issues of presentation, interaction, and evaluation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5050 (3) Japanese Sociolinguistics: Japanese Language and Society

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4050 and LING 4050

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5070 (3) Second Language Acquisition of Japanese

Studies language acquisition theories and research on Japanese as a second language (JSL). Covers the issues in JSL from linguistic, cognitive and sociolinguistic perspectives: orthography, grammar, phonology and vocabulary in the contexts of teaching and learning JSL.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4070

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5080 (3) Kanji in Japanese Orthography

Covers the issues in kanji research from historical, sociolinguistic, linguistic, cognitive perspective and vocabulary acquisition theories in the context of teaching and learning the Japanese language.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4080

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5150 (3) Japanese Literary Translation

Explores theories and practice of translation of literary texts as applied to Japanese-English translation; strategies for handling a variety of texts; and professional standards and ethics.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5210 (3) Classical Prose Literature

Examines selected prose works and authors from the Classical, or Heian, period (784-1185). Texts may include selections from diaries, tale literature, and *zuihitsu* such as *Izumi Shikibu Nikki*, *Genji Monogatari*, and *Makura no Soshi*. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5220 (3) Waka, Renga, and Haiku

Studies the three most important poetic forms in Japanese literary history. Emphasizes the reading and analysis of selected texts and authors that best represent these genres. Readings include selections from the first eight imperial poetry anthologies (*hachidaishu*), famous *renga* sequences (Minase Sangin Hyakuin, for example), and the haiku of Basho. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5280 (3) Topics in Classical Japanese Literature

Studies a specific problem or issue in classical (eighth through twelfth century) Japanese literature, e.g., the development of specifically Japanese theories of literature or the concept of genre in the Japanese tradition. Topics vary from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5310 (3) Advanced Classical Japanese 1

Focuses on stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras. Department enforced: knowledge of Classical Japanese at the level of JPNS 4310 is required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5320 (3) Advanced Classical Japanese 2

Advanced analysis of stylistic, grammatical, and orthographic variations in texts of the classical, medieval, and early modern eras, including *kanbun* and *hentaigana*; translation and explication of texts.

Requisites: Requires prerequisite course of JPNS 5310 (minimum grade C). Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5410 (3) Medieval Prose Literature

Focuses on selected prose works and authors from the medieval, or Kamakura and Muromachi periods (1185-1600). Texts may include selections from a variety of war tales, histories, courtly fiction, diaries, memoirs, short prose narratives (*otogi-zoshi*), *Noh* plays, and Buddhist literature such as *Heike Monogatari*, *Towazugatari*, *Izayoi Nikki*, *Tsurezuregusa*, and *Shasekishu*. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5420 (3) Japanese Buddhism and Literature

Studies selected works from the Japanese literary tradition in which Buddhism plays a significant thematic role. Focuses on texts such as the *Nihon Ryoiki*, Buddhist poetry (Shakkyo-Ka) from the imperial poetry anthologies, Heike Monogatari, Hojoki, the poetry of Saigyō and Bashō, and selected Noh plays. Texts and selections vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5480 (3) Topics in Medieval Literature

Focuses on a specific problem or issue in medieval literature, e.g., the spread of literary composition beyond the court. Topics vary from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5610 (3) Japanese Dramatic Literature

Examines major writers and texts of the no, kyōgen, kabuki, and bunraku theaters, including the plays and critical writings of such authors as Kannami Kiyotsugu, Zeami Motokiyo, Konparu Zenchiku, and Chikamatsu Monzaemon. Texts and secondary readings vary from year to year. Knowledge of Classical Japanese at the level of JPNS 4320 is required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5620 (3) Early Modern Japanese Literature and Culture

Examines the literature, arts, drama and culture of Japan's early modern period in the original language, as well as secondary scholarship and methodologies for pursuing work on early modern materials. Genres covered include kana-zōshi, uklyō-zōshi, dangibon, yomihon, sharebon, kibiyoshi, ninjobon, kokkelbon, gokan, halkai, senryō, kyōka, joruri, kabuki, and literary thought.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5810 (3) Modern Japanese Literature

Studies selected texts in Japanese literature from the Meiji Restoration (1868) to the end of the Pacific War. Surveys various literary genres, emphasizing the development of the modern novel as an aspect of Japan's response to Western cultural forms. The unique cultural politics of each of the periods (Meiji, Taishō, and Showa) are illuminated through the filter of both canonical and more marginalized texts. Specific selections vary from year to year.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5820 (3) Contemporary Japanese Literature

Covers developments in Japanese prose fiction and/or other literary genres from the end of the Pacific War in 1945 to the present.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5830 (3) Readings in Modern and Contemporary Japanese Thought and Culture

Examines central issues in Japanese culture and society since the Meiji Restoration (1868) through selected readings of the works of major writers in the fields of literature, anthropology, feminism, political science, and religion, among others. Provides a broad context for cultural studies in modern and contemporary Japan by positioning the most important commentators within their historical and social situations.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5920 (1-3) Topics in Modern Literature and Culture

Close study of a specific problem or issue in modern or contemporary literature or culture: e.g., transwar literary nationalism. Formerly JPNS 5880.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 5980 (1) Practical Issues in Japanese Language Pedagogy

Focuses on practical issues in Japanese language pedagogy for students who will serve as teaching assistants in Japanese language class. Examines the connection between theory and practice as well as practical methods for teaching Japanese. Discusses how to teach Japanese as a second language in a communicative approach and how to assess student language learning. Department enforced prerequisite: knowledge of Modern Japanese at the level of JPNS 4120.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4980

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 6900 (1-6) Japanese Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 6940 (1) Japanese Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 6950 (1-6) Japanese Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

JPNS 8990 (1-10) Doctoral Dissertation

All doctoral students must register for no fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Japanese
Departmental Category: Asia Content

Jewish Studies (JWST)

Courses

JWST 1040 (3) Beginning Biblical Hebrew, Second Semester

Building on HEBR 1030, continues to build expertise in reading the Hebrew Bible. Modern language acquisition and classical grammar study methods equip students with the tools to translate and read the various genres of the Biblical material. Department enforced prerequisite: HEBR 1030 or JWST 1030 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: HEBR 1040

JWST 1234 (3) Mysticism and the Jewish American Literary Tradition

Explores the mystical tradition within Judaism from ancient times to the present. With roots in the Hebrew Bible, Jewish mysticism is one of the oldest forms of mysticism and has had an influence on some of the greatest philosophical traditions of western civilization.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 1340

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

JWST 1818 (3) Introduction to Jewish History: Bible to 1492

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1818 and RLST 1818

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

JWST 1828 (3) Introduction to Jewish History: Since 1492

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1828 and RLST 1828

Additional Information: GT Pathways: GT-HI1 - History
Arts Sci Core Curr: Historical Context

JWST 1830 (3) Global History of Holocaust and Genocide

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1830 and RLST 1830

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

JWST 1900 (3) Introduction to the Hebrew Bible/Old Testament

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

Equivalent - Duplicate Degree Credit Not Granted: RLST 1900

Grading Basis: Letter Grade

JWST 1910 (3) Introduction to the New Testament

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

Equivalent - Duplicate Degree Credit Not Granted: RLST 1910

Grading Basis: Letter Grade

JWST 2350 (3) Introduction to Jewish Culture

Explores the development and expressions of Jewish cultures across the chronological and geographical map of the Jewish people, with an emphasis on the variety of Jewish ethnicities and their cultural productions, cultural syncretism, and changes, including such issues as sexuality and foodways. Sets the discussion in relevant contexts and looks at cultural representations that include literary, religious and visual texts.

Equivalent - Duplicate Degree Credit Not Granted: GSLL 2350

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 2502 (3) Representing the Holocaust

Examines representations of the Holocaust in film, memoirs, poetry, novels, graphic novels, memorials. Considers questions such as: How to depict an event that resists representation? How does the memory of the Holocaust transform over generations? How do representations of the Holocaust inform our understanding of other experiences of racism and genocide? What ethical issues are at stake?

Equivalent - Duplicate Degree Credit Not Granted: JWST 2502

Additional Information: Arts Sci Core Curr: Ideals and Values

JWST 2551 (3) Modern Jewish Literature

Examines Jewish experience through the study of literary texts from around the world, mainly from the 20th and 21st centuries. Discusses issues pertaining to secularism and tradition; diasporas and homelands; modernity and questions of identity raised by the intellectual transitions brought about by political and social emancipation; sexualities; enormous changes wrought by population redistributions, world wars and rapid cultural transformations. Formerly GSLL 2551.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Hebrew

JWST 2600 (3) Judaism, Christianity, and Islam

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2600

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Asia Content

JWST 3100 (3) Judaism

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3100

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

JWST 3110 (3) Of Jewish Legends, Folktales and the Supernatural

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3110

JWST 3120 (3) Radical Jews

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3120

Grading Basis: Letter Grade

JWST 3200 (3) Religion and Feminist Thought

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3200

JWST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 3202 and RLST 3202 and WGST 3201

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 3310 (3) The Bible as Literature

Surveys literary achievements of the Judeo-Christian tradition as represented by the Bible. Formerly JWST 3312.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3310 and HUMN 3310

Additional Information: Arts Sci Core Curr: Ideals and Values

JWST 3401 (3) The Heart of Europe: Filmmakers and Writers in 20th Century Central Europe

Surveys the major works of 20th century central and central east European film and literature. Examines cultural production in the non-imperial countries and non-national languages of the region including Yiddish, Belarusian, Czech, Hungarian, Polish and Romanian, among others. Traces the rise of nationalism over the course of the century from the age of empires through the Cold War.

Equivalent - Duplicate Degree Credit Not Granted: GSSL 3401

JWST 3501 (3) German-Jewish Writers: From the Enlightenment to the Present

Provides insight into the German-Jewish identity through essays, autobiographies, fiction and journalism from the Enlightenment to the post-Holocaust period. Examines the religious and social conflicts that typify the history of Jewish existence in German-speaking lands during the modern epoch.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3501

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3530 and RLST 3530

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 3600 (3) Contemporary Jewish Societies

Uses transnational lens to explore contemporary debates about Jewish people, places and practices of identity and community; places that Jews have called 'home', and what has made, or continues to make those places 'Jewish'; issues of Jewish homelands and diasporas; gender, sexuality, food and the Jewish body; religious practices in contemporary contexts. Readings drawn primarily from contemporary journalism and scholarship.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3600 and GSSL 3600

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 3610 (3) Topics in International Affairs and Jewish Studies

Explores topics in international affairs as it relates to Jewish culture and society. Subjects addressed under this heading vary according to student interest and faculty availability.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3610

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 3650 (3) History of Arab-Israeli Conflict

Explores the origins and development of the Arab-Israeli conflict. Traces Arab-Jewish/Israeli relations from the 19th century through the Palestine Mandate, the evolution of Arab and Jewish nationalism and the creation of Israel to the present day.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3650

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Asia Content

JWST 3930 (3) Internship in Jewish Studies

Learn beyond the classroom by interning in a local non-profit organization that connects with the Program in Jewish Studies through its mission and/or program. Interns will attend class to learn about work place ethics, professional development and leadership skills through a Jewish Studies lens. Interns will be supervised by the faculty member of record as well as the employer housing the intern.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites HEBR 2350 or JWST 2350 or HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828.

JWST 4000 (1-3) Capstone in Jewish Studies

Serves as the final product for students completing the major in Jewish Studies. Students will design a project under the supervision of a mentor that serves as the summation of their past work in Jewish Studies. Capstone projects can take the form of a thesis, film or another media. Instructor consent required for JWST minors.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Jewish Studies (JWST) BA majors only. Excludes JWST minors.

JWST 4050 (3) Anthropology of Jews and Judaism

Explores topics in Jewish anthropology. Uses the lens of anthropological inquiry to explore, discover and analyze different concepts within Jewish culture. Topics explored will include customs, religious practices, languages, ethnic and regional subdivisions, occupations, social composition, and folklore. Explores fundamental questions about the definition of Jewish identity, practices and communities.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4050

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 4101 (3) Topics in Hebrew Studies

Explores topics in Hebrew and Jewish literature and cultures. These may include topics such as diasporic literatures, Jewish artists and thinkers, courses on specific authors, figures or communities. Topics change each semester. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 4101

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 4122 (3) Music in Jewish Culture

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4122

Grading Basis: Letter Grade

JWST 4170 (3) God and Politics

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4170 and RLST 5170

JWST 4180 (3) Is God Dead?

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4180 and RLST 5180

JWST 4203 (3) Israeli Literature: Exile, Nation, Home

Examines the creation and development of Israeli literature from its pre-State beginnings to the present day, from the writings of immigrants for whom Hebrew was not their mother tongue to a literature written by native Hebrew speakers. Considers texts written by Israeli Jewish and Arab writers and explores how ideas of exile, nation, and home play into the Israeli experience.

Equivalent - Duplicate Degree Credit Not Granted: HEBR 4203

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites ENGL 4677 or JWST 4677 or GRMN 2502 or JWST 2502 or JWST 2551 or WRTG 3020.

Additional Information: Arts Sci Core Curr: Literature and the Arts

JWST 4260 (3) Topics in Judaism

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4260 and RLST 5260

Repeatable: Repeatable for up to 9.00 total credit hours.

JWST 4301 (3) Venice: The Cradle of European Jewish Culture

Explores the development of European Jewish culture from the late Middle Ages to the present by focusing on Jewish life in the city of Venice, Italy. Emphasis is on the development of Venetian print culture and emergence of Italy as a center of Jewish publishing in both the religious and secular world. Examines a variety of cultural and historical material including early printings of the Talmud, the creation of Yiddish popular literature, Hebrew rabbinic literature, responses to political turmoil, and the aftermath of the Nazi genocide. Taught in English. Department enforced prerequisite: HEBR 2350 or JWST 2350 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: HEBR 4301

Additional Information: Arts Sci Core Curr: Literature and the Arts

JWST 4302 (6) Global Seminar: Justice, Human Rights and Democracy in Israel

Explore the challenges and complexities of justice, democracy and human rights in Israel and the West Bank through field trips, course work and service learning projects with Jerusalem based non-profit organizations. Acquire new knowledge and lived experience on critical issues facing Israelis and Palestinians with the wider scope of Middle East politics.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3520

Recommended: Prerequisites ANTH 4050 or JWST 4050 and IAFS 3600 or JWST 3600.

Additional Information: Arts Sci Core Curr: Contemporary Societies Departmental Category: Asia Content

JWST 4338 (3) History of Modern Israel/Palestine

Explore the history culture, and politics of this crossroads of Europe and Asia from the late Ottoman period to the present. Topics include: nationalism and colonialism, development of Zionist ideology, Palestinian nationalism, the Jewish community (Yishuv) under British rule, the founding of the State of Israel, Arab-Israeli and Palestinian-Israeli relations, Israel's minorities, and the conflict of religion and state.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4338

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1308 or JWST 2350 or other course work in Middle Eastern or Jewish History.

JWST 4348 (3) Topics in Jewish History

Covers topics in Jewish history from biblical beginnings to present day. Topics vary each semester. Consult the online Schedule Planner for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4348

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of HIST 1308 or HIST 1828 or JWST 2350 (minimum grade D-).

JWST 4378 (3) History of Modern Jewish-Muslim Relations

Examines the modern history and culture of Jewish communities under Islamic rule in the Middle East and North Africa; Jews' and Muslims' encounters with empire, westernization and nationalism; representations of Sephardi and Eastern Jews; Jewish-Muslim relations in Europe and the U.S.; and contact and conflict between Jews and Muslims in (and about) Israel/Palestine. Sources include memoirs, diaries, newspapers and films.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4378

Additional Information: Departmental Category: Asia Content

JWST 4401 (3) The Russian Jewish Experience

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4401 and RUSS 5401

Recommended: Prerequisite any 1000 or 2000-level undergraduate literature course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

JWST 4454 (3) Jewish Intellectual History

Takes students on a journey from Medieval Spain to contemporary United States to explore how Jews, living in different societies, have attempted to reshape and interpret central Jewish values and beliefs in accordance with the prevailing ideas of their host societies. Focuses on the historical context of each Jewish society that produced the thinkers and ideas considered in this course.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4454

Additional Information: Departmental Category: Europe: Topical

JWST 4534 (3) Modern European Jewish History

Focus on the last 500 years of European Jewish history, from 1492 until the present, to examine Jews' place in European history and how Europe has functioned in Jewish history. Does not end with the Holocaust, since, although Hitler and the Nazis attempted to destroy European Jewish civilization, they did not succeed. Rather, this course will spend several weeks looking at European Jewish life in the past sixty year.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4534

Recommended: Prerequisite HIST 1818 or JWST 1818 or HIST 1828 or JWST 1828 or HIST 1012.

Grading Basis: Letter Grade

JWST 4544 (3) History of Yiddish Culture

Jews have produced culture in Yiddish, the vernacular language of Eastern European Jewry, for 1000 years and the language continues to shape Jewish culture today. We will look at the literature, film, theater, music, art, sound and laughter that defined the culture of Eastern European Jewry and, in the 20th century, Jews around the world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4544 and HIST 5544

Recommended: Prerequisite HIST 1818 or JWST 1818 or JWST 1828 or GSSL 2350 or JWST 2350.

JWST 4580 (3) The Holocaust: An Anthropological Perspective

Focuses on the Holocaust during the Third Reich, which involved the murder of millions of people, including six million Jews. Reviews the Holocaust's history, dynamics and consequences as well as other genocides of the 20th century, using an anthropological approach.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4580

JWST 4677 (3) Jewish-American Literature

Explores the Jewish-American experience from the 19th century to the present through writers such as Sholom Aleichem, Peretz, Babel, Singer, Malamud, Miller, Ginsberg and Ozick. The Jewish experience ranges from the travails of immigration to the loss of identity through assimilation. Formerly JWST 3677.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4677

Additional Information: Arts Sci Core Curr: Human Diversity

JWST 4827 (3) Modern U.S. Jewish History since 1880

Explores the experience of Jews in the United States from the 1880's when the great migration of Jews from Eastern Europe began, through the twentieth century. Students will explore the changing ways in which Jews adapted to life in the U.S., constructed American Jewish identities, and helped to participate in the construction of the United States as a nation.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4827

Additional Information: Departmental Category: United States: Topical Courses 2

JWST 4900 (1-6) Independent Study in Jewish Studies

Working with a faculty member in Jewish Studies on an independent study research project provides students with an opportunity to learn outside the formal classroom structure, with individual direction from Jewish Studies faculty on a topic of mutual interest not offered in regularly scheduled classes. (Independent study may not be used to substitute for a regular course not being offered in a given term.)

Repeatable: Repeatable for up to 6.00 total credit hours.

Journalism (JRNL)

Courses

JRNL 1000 (3) Principles of Journalism and Networked Communication

Surveys the history, practices and responsibilities of journalism in a democracy. Examines ethics, best practices in institutional and network settings, reporting and writing, international news systems, personal branding, and strategies for creating and distributing content across media platforms. Promotes the highest professional values and encourages students to be leaders who recognize the possibilities of journalism in a democratic society.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) undergraduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 1871 (1-3) Special Topics for First-Year Students

Special studies in media that are specific for first-year students. May be repeated for a maximum of three credit hours.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 2001 (3) Fundamentals of Reporting

Develops basic news-gathering skills for work in news enterprises. Students learn techniques central to research, reporting, writing and producing stories for various media formats.

Requisites: Requires prerequisite course of JRNL 1000 (formerly JOUR/JRNL 2601) (minimum grade C-). Restricted to Journalism (JRNL) majors only.

JRNL 2401 (3) Media Coverage of Diverse Populations

Explores the ways in which issues of gender, gender expression, sexual orientation, race, ethnicity and religion play out in news coverage and how news organizations approach coverage of marginalized groups in society.

Grading Basis: Letter Grade

JRNL 3102 (3) Photojournalism I

Introduces the basic elements of visual communication. Covers the use of camera systems, digital imaging techniques and other aspects of photojournalism including law, ethics, history and critical decision-making.

Requisites: Requires a prerequisite course of JRNL 1000 or (formerly JOUR/JRNL 2601) (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Journalism (JRNL) majors or Program in Journalism Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 3112 (3) Concepts in Visual Culture

Studies the principles, theories and language of visual communication, emphasizing the evaluation and use of images in mass media. Designed to help students build theories and practices learned in previous classes and perfect their skills integrating words and pictures in communication to gain a greater appreciation of the visual world.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3201 (3) Critical Perspectives on Journalism

Introduces students to the critical perspectives most often employed in qualitative analysis of journalistic texts and practice: Marxism, psychoanalytical criticism, semiology, sociological criticism, structuralism, etc. Emphasis is upon texts from contemporary print and broadcast media, although students may also explore documentary film and literary journalism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3202 (3) Covering Political Campaigns

Provides a blend of theoretical understanding and on the ground experience for students interested in learning about the forces that shape election coverage and the practicalities of reporting on the local and national races for public office.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3211 (3) History of Broadcasting

Offers a broad overview of significant broadcast programs, the institutions and sociocultural and economic influences that have steered the course of radio, television and electronic media history in the United States.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3221 (3) History of Digital Journalism

Explores the history, economics and traditions of digital technologies. Addresses the interaction between digital technologies, culture and economy with particular emphasis on the effects on digital journalism. Concludes with a focus on how these concepts are embraced by new journalism market models.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3231 (3) History of Documentary Film

Explores the evolution of the documentary, both in feature films and on television, to understand how the genre offers both historical context and an understanding of the world in which we live.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3241 (3) History of Journalism

Explores the foundations of journalism practice in a historical context. Students study the evolution of the news industry and analyze examples of contemporary broadcasting, photography, online and print media in light of the past.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3401 (3) Sociology of News

Provides students with an introduction to the factors that shape news reporting and production, including gatekeeping, intermedia agenda setting, pack journalism, beat structures, news values and issues unique to the various platforms on which news is delivered.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3402 (3) Social Media Storytelling

Investigates the theory, ethics and best practices in storytelling across a variety of social media platforms including, but not limited to, Facebook, Twitter, Instagram, Snapchat, Medium and YouTube. Examines best practices for social media engagement. Students develop a story for multiple platforms and analyze the story performance on the sites and make recommendations for best practices.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3552 (3) Editing and Presentation

Explores copy editing, graphic principles and processes, new media technology.

Requisites: Requires prerequisite course of JOUR/JRNL 2001 or JRNL 1000 (formerly JOUR/JRNL 2601) (minimum grade C-). Restricted to Journalism (JRNL) or News Editorial (NSED-BSJR or JNED-BSJR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 3614 (3) Principles of Audio Production

Introduces audio production techniques using digital technologies. Students learn to apply fundamental principles to create professional radio and online programs including podcasting.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) or Program in Journalism and Mass Communication (JOUR) majors with a minimum of 45 hours taken.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 3644 (3) Principles of Television Production

Emphasizes the use of video technologies in both field and studio production, camera and editing work, producing and directing for professional program production.

Requisites: Requires prerequisite course of JRNL 2001 or JRNL 1000 (formerly JOUR/JRNL 260; min grade D-). Restricted to JRNL or BCNS-BSJR or JBCN-BSJR or BCPM-BSJR or JBCP-BSJR majors only with a min of 57 hours taken.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 3651 (3) Media Law and Ethics

Studies state and federal laws and court decisions that affect the media in order to develop knowledge of media rights and responsibilities and an understanding of the legal system. Provides students with an overview of the theory, ethics, codes, and analytical models that are used in journalism, and introduces students to a variety of ethical issues that can arise in journalism.

Requisites: Restricted to College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) undergraduate students only.

JRNL 3674 (3) Television Production 2

Covers studio productions for "Newsteam Boulder." Students also do field projects to sharpen their writing, video production, and editing skills.

Requisites: Requires prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 3704 (3) Sports Writing

Prepares students for the world of sport journalism. Combines the skills of a hard news reporter, the perspective of an entertainment reporter and the persuasive abilities of an editorial writer.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 3804 (3) Sports, Media and Society

Examines how sports, culture and especially the media, with a specific focus on journalism, all come together to influence society. Explores how sports communication affects, and is affected by, the issues and tension that touch society at large, such as law and politics, race, gender, sexuality and disability.

Equivalent - Duplicate Degree Credit Not Granted: MDST 3331

Requisites: Restricted to students with a minimum of 29 credits completed.

Grading Basis: Letter Grade

JRNL 4002 (3) Reporting 2

Assumes mastery of basic reporting and writing skills. Students produce more sophisticated stories on a variety of topics.

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or News Editorial (NSED-BSJR or JNED-BSJR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4011 (3) Principles of Media Relations

Provides students with information about the ethics, history and practice of media relations (community affairs, community relations, customer relations, government relations, industry relations, internal communications, public relations, press agency, public affairs, publicity, etc.). Introduces students from multiple academic disciplines to the genres of writing required for a media relations career.

Grading Basis: Letter Grade

JRNL 4102 (3) Photojournalism Portfolio

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5102

Requisites: Requires a prerequisite course of JOUR/JRNL 3102 (minimum grade C-).

Additional Information: Departmental Category: Print Online Journalism

JRNL 4311 (3) Literary Journalism

Studies the contributions of American literary journalists from Sara Davidson, Joan Didion, Norman Mailer, Hunter S. Thompson and Tom Wolfe; to established writers of nonfiction, including Annie Dillard, Jon Krakauer, Jane Kramer, Adrian Nichole LeBlanc and Terry Tempest Williams; to the newest wave of long-form journalists. Explores the boundaries between fiction and nonfiction and the literary techniques that distinguish creative nonfiction and literary journalism from other reportorial and storytelling forms.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4344 (3) Video Documentary Production

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5344

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4351 (3) Reporting Wars, Conflict and Peace

Explores how journalists report international breaking news with a focus on war, disaster and peace and how these news events affect peoples' lives, governmental decisions and news media operations.

Requisites: Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication students with a minimum of 73 hours taken.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 4354 (3) TV Reporting

Students learn basic broadcast reporting skills – where to find news and how to cover it, how to analyze and organize news stories. Skills are linked with advanced concepts of shooting and editing videotape in order to produce news stories on deadline.

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4401 (3) News and Public Perception

Considers the impact that news and journalistic practice have on the public through processes like agenda setting and second-level agenda setting, as well as issues such as news avoidance, the spiral of silence and political cynicism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4411 (3) International Media and Global Crises

Investigates how media organizations, audiences and other international organizations function during various global crises, such as national disasters, climate change and health epidemics, due to imbalanced distribution of wealth and resources, ethnic tensions and diplomatic failures.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4502 (3) Reporting 3

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5502

Requisites: Requires prerequisite courses of JRNL 3552 and JRNL 4002 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) News Editorial (NSEJ or JNED) or Journalism (JRNL) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4562 (3) Digital Journalism

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5562

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4572 (3) News Corps

CU News Corps provides students the opportunity to immerse themselves in a single project and then produce an in-depth text based or multimedia explanatory/investigative story for publication in professional media. Students spend several weeks studying the subject in question before reporting and producing their stories.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4602 (3) Opinion Writing

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5602

Requisites: Requires a prerequisite course of JRNL 2001 (minimum grade C-).

Additional Information: Departmental Category: Print Online Journalism

JRNL 4614 (1-3) Advanced Audio Practices

Applies advanced skills in producing in-depth audio programming for radio stations in Colorado and for weekly discussion-critique sessions.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of JOUR/JRNL 3614 (minimum grade C-). Restricted to Journalism (JRNL) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4624 (4) News Team

Students participate in Newsteam Boulder a program broadcast live over the Boulder cable television system.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5624

Requisites: Requires prerequisite course of JOUR/JRNL 4354 (minimum grade D-). Restricted to Journalism (JRNL) or Broadcast News (BCNS - BSJR or JBCN-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4634 (1-3) Broadcast Projects

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Prepares radio or television documentaries and informational/entertainment programs.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5634

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4651 (3) Advanced Media Ethics

Examines the responsibilities, the power and the problems of news media through the lens of ethical inquiry. Applies the philosophical and other perspectives from humanities and social sciences to consider ethical frameworks for guiding journalism in an era of technological disruption. Examines issues including privacy, conflicts of interest, undercover reporting, use of graphic images, interviewing trauma victims and other concerns in journalism through the lens of moral philosophy, best practices and codes of ethics.

Requisites: Requires prerequisite course of JRNL 3651 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4674 (1-3) Television Production 3

Provides in-depth experience in directing and producing television programs.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of JOUR/JRNL 3674 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4684 (3) Advanced Camera and Editing

Emphasizes the advanced techniques in digital video camera usage and digital editing for professional broadcast video production.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5684

Requisites: Requires a prerequisite course of JOUR/JRNL 3644 (minimum grade C-). Restricted to Journalism (JRNL) or Broadcast News (BCNS-BSJR or JBCN-BSJR) or Broadcast Production (BCPM-BSJR or JBCP-BSJR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4702 (3) Arts/Cultural Reporting and Criticism

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5702

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4704 (3) Athletic Media Relations

Offers the opportunity to both observe and experience what is required to work in the world of intercollegiate athletic media relations and professional sports public relations. Covers how to write and how to budget the vital components of publications, media bias and crisis management.

Requisites: Requires prerequisite course of JRNL 3704 (minimum grade C-).

Grading Basis: Letter Grade

JRNL 4714 (3) Sports Broadcasting

Teaches students how to do live sports television production. Students will learn the sports TV business from the ground up and be responsible for participating in the broadcasting of three to four live sporting events.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

JRNL 4724 (3) Sports Announcing

Teaches students about sports talk and sports announcing, how to interview sports celebrities and the legal considerations and ethics of the business. Students will be doing play-by-play and color of live sporting events.

Grading Basis: Letter Grade

JRNL 4802 (3) Feature Writing

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5802

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4822 (3) Reporting on the Environment

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5822

Requisites: Requires prerequisite course of JRNL 2001 (minimum grade C-). Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

JRNL 4872 (1-3) Special Topics: Print

Equivalent - Duplicate Degree Credit Not Granted: JRNL 5872

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Journalism (JRNL) or Program in Journalism and Mass Communication (JOUR) majors with a minimum of 57 hours taken.

Additional Information: Departmental Category: Print Online Journalism

JRNL 4874 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Journalism (JRNL or JOUR) majors only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

JRNL 5001 (3) Media Technology Boot Camp

Offers a foundation in the technologies of journalistic storytelling across a variety of established and emerging media platforms, such as print, television, radio, online publications, blogs, social media and emerging forms of communication. Students will emerge from the course with basic competence in the technical tools they will need as journalists.

Requisites: Restricted to graduate students only.

JRNL 5011 (3) Newsgathering and Multimedia Storytelling

Develops skills in research and reporting on public issues and news events, and in the construction of narrative in the journalistic and documentary traditions, using a variety of media platforms.

Requisites: Restricted to graduate students only.

JRNL 5102 (3) Photojournalism Portfolio

Advanced course intended to give students a forum in which technical skills will be brought to professional standards. Build a polished portfolio of work to present to editors and buyers.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4102

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5344 (3) Video Documentary Production

Designed to give students the experience of researching, writing, shooting and editing their own documentaries.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4344

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5502 (3) Newsgathering 2

Involves writing news and features about actual events for publication under deadline pressure. Lab to be arranged.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4502

Requisites: Requires prerequisite courses of JOUR 5511 and JRNL/JOUR 5552 (all minimum grade C-). Restricted to College of Media, Communication, and Information (CMCI) graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5512 (3) In-Depth Reporting

Shows how to dig beneath the surface of issues and events. Focuses on research, interviewing, and writing.

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5514 (3) Newsgathering for Television

Teaches advanced principles and techniques involved in the preparation of news for broadcasting.

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5521 (3) Precision Journalism

Instructs students in data-driven investigative reporting. Includes hands-on, in-depth instruction in gathering data from census reports, commercial databases, global information networks, and other sources, and utilizing spreadsheets to analyze the information in ways that can help deepen and strengthen journalistic stories on a wide variety of subjects.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5552 (3) News Editing

Discusses principles and practice in copy editing and writing headlines for local and wire stories. Practice in page makeup, picture editing, and electronic editing.

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5562 (3) Digital Journalism

Builds upon digital production skills through the creation of multimedia project. Applies media theory to evaluate digital media content and explore how digital forms influence the news industry, politics, culture and society.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4562

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5602 (3) Opinion Writing

Concentrates on several of the subjective areas of journalism. Emphasizes editorial and column writing, editorial pages and blogging.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4602

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5624 (4) News Team

Students participate in Newsteam Boulder a program broadcast live over the Boulder cable television system.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4624

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5634 (1-3) Broadcast Projects

Covers interpretation, preparation, and/or reporting in programs for broadcast media. Prepares radio or television documentaries and informational/entertainment programs. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4634

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Broadcast Journalism

JRNL 5651 (3) Journalism Law & Ethics

Explores the legal and ethical frameworks of journalistic practice and media production. Covers historical as well as current frameworks used in examining the legal and ethical issues that arise in newsgathering and publication. Examines the relationships between ethics and the law in various media context.

Requisites: Restricted to graduate students only.

JRNL 5684 (3) Advanced Camera and Editing

Emphasizes the advanced techniques in digital video camera usage and digital editing for professional broadcast video production.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4684

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 and JRNL 5514 (all minimum grade C-). Restricted to graduate students only.

JRNL 5702 (3) Arts/Cultural Reporting and Criticism

Emphasizes composition of criticism for the performing arts and other areas of entertainment.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4702

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5802 (3) Feature Writing

Provides practice in writing freelance articles. Considers types, sources, methods, titles, illustrations, and freelance markets. Students submit work for publication.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4802

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5812 (3) Science Writing

Helps students acquire the basic skills and knowledge required of science journalists. Also examines issues of scientific importance such as climate change, the nature of scientific knowledge, and how science is covered in various media.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5822 (3) Reporting on the Environment

Involves reporting and writing about the environment by taking into account the scientific, technological, political, economic and cultural dimensions of environmental subjects.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 4822

Requisites: Requires prerequisite courses of JRNL 5001 and JRNL 5011 (all minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Print Online Journalism

JRNL 5841 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5851 (1-6) Graduate Professional Project

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5871 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

JRNL 5872 (1-3) Special Topics: Print**Equivalent - Duplicate Degree Credit Not Granted:** JRNL 4872**Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Print Online Journalism**JRNL 5874 (1-3) Special Topics: Electronic Media****Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to Journalism (JRNL) graduate students only.**Additional Information:** Departmental Category: Broadcast Journalism**JRNL 5931 (1-3) Internship****Repeatable:** Repeatable for up to 3.00 total credit hours.**Requisites:** Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**JRNL 6321 (3) Literary Journalism**

Analyzes the work of journalists who became some of the greatest fiction writers of the 19th and 20th centuries, and examines the increasingly indistinct lines between journalism and narrative fiction.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**JRNL 6651 (3) Media Law**

Graduate seminar in communications law. Studies changing law and applied legal research techniques.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**JRNL 6871 (3) Special Topics****Repeatable:** Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**JRNL 6940 (1) Master's Degree Candidate****Requisites:** Restricted to graduate students only.**Grading Basis:** Pass/Fail**JRNL 7001 (3) Theories of Journalism Studies**

Introduces the principal concepts, literature and theoretical and paradigmatic perspectives of journalism studies, and explores their ties and contributions to parallel domains in the social sciences and humanities.

Requisites: Restricted to graduate students only.**JRNL 7002 (3) Journalism Research Design**

Adopts a holistic and creative approach to bridging theory with method for the purpose of research design. Students explore designs that effectively address research questions through elaboration of theoretical and operational linkages.

Requisites: Requires prerequisite courses of JRNL 7001 and MDRP 7051 and MDRP 7061 (all minimum grade C-). Restricted to graduate students only.

Korean (KREN)

Courses

KREN 1010 (5) Beginning Korean 1

Trains students in elementary conversational and writing skills and provides grounding in the basic idiomatic and syntactical features of Korean, through lectures, drills, and language laboratory sessions based on set dialogues and readings.

Additional Information: Arts Sci Core Curr: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

KREN 1011 (3) Introduction to Korean Civilization

Introduces the history of Korean culture within the context of political, social, and economic history. Covers the old Choson dynasty to present day Korea. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Korean Courses in English

Departmental Category: Asia Content

KREN 1020 (5) Beginning Korean 2

Continuation of KREN 1010.

Requisites: Requires prerequisite course of KREN 1010 (minimum grade C).**Additional Information:** Arts Sci Core Curr: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

KREN 2110 (5) Intermediate Korean 1

Extends the conversational and written skills acquired at the elementary level. Although emphasis remains on spoken Korean, readings are increased, elementary writing skills are introduced gradually, and some Sino Korean characters are taught.

Requisites: Requires prerequisite course of KREN 1020 (minimum grade C).**Additional Information:** Arts Sci Core Curr: Foreign Language

Departmental Category: Korean

Departmental Category: Asia Content

KREN 2120 (5) Intermediate Korean 2

Continuation of KREN 2110.

Requisites: Requires prerequisite course of KREN 2110 (minimum grade C).**Additional Information:** Departmental Category: Korean

Departmental Category: Asia Content

KREN 2441 (3) Film and Korean Culture

Introduces Korean/South Korean cinema from colonial period to the contemporary including old Korean black and white films, the earliest talkie films and contemporary art films. Considers cinema as a window to see the tumultuous and diverse culture of modern Korea. Taught in English. No prior knowledge of Korea, Korean film or film art is required.

Additional Information: Departmental Category: Korean Courses in English

Departmental Category: Asia Content

KREN 3110 (5) Advanced Korean 1

Promotes an advanced level of speaking, reading, and writing. Focuses on contemporary business Korean language as reflected in various Korean media such as newspapers, magazines, and television. The goal is to acquire Korean language skills at a level that allows students to conduct business activities.

Requisites: Requires prerequisite course of KREN 2120 (minimum grade C).

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

KREN 3120 (5) Advanced Korean 2

This second semester of Korean offers advanced level speaking and writing. Focuses on understanding contemporary Korean languages as reflected in various communication media, such as print, TV, and films to help students understand Korean in a variety of contexts.

Requisites: Requires prerequisite course of KREN 3110 (minimum grade C).

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

KREN 3841 (3) Modern Korean Literature in English Translation

Surveys masterpieces of modern Korean literature written by significant Korean/Korean American authors in English. Provides various literary and theoretical frameworks to understand Korean literature within the context of Asian global culture. Covers from colonial period to the present. Taught in English. No prior knowledge of Korea or Korean literature is required.

Additional Information: Departmental Category: Korean Courses in English

Departmental Category: Asia Content

KREN 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Korean
Departmental Category: Asia Content

Language Technology (LGTC)

Courses

LGTC 5010 (3) Fundamentals of Second Language Acquisition and Teaching Practice

Introduces students to major theoretical approaches to Second Language Acquisition and explores their educational potential through scholarly readings and practical implementation and assessment of their usefulness in the foreign language classroom. This course is offered online summer semesters (D Term) through the School of Continuing Education.

Grading Basis: Letter Grade

LGTC 5020 (3) Educational Technology Foundation

Introduces the field of language technology from its origin to today; the latest theories and practices in technology integration; key journals, trends, issues and researchers in the field. This course is offered online summer semesters (D Term) through the School of Continuing Education.

Grading Basis: Letter Grade

LGTC 5030 (2) Language Technology Tools in Practice

Introduces students to major technical tools, explores their educational potential through scholarly readings and practical implementation and assessment of their usefulness in the classroom. This course is offered online fall semesters through the School of Continuing Education.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

LGTC 5032 (2) Gamification of Language Learning

Understand the fundamental aspects of games and gamification. Be able to distinguish between gaming and gamification in a classroom context. Explain and apply how games can support instruction. Identify various game tools and resources for classroom use and explain how these tools and resources support learning. Use appropriate professional language to discuss game mechanics in a learning context. Apply ACTFL standards for teaching and learning to gameful learning contexts.

Grading Basis: Letter Grade

LGTC 5035 (2) Online Language Learning: Best Practices

Explores the topic of teaching and learning languages online with an emphasis on employing best practices, course design, assessment and the use of synchronous and asynchronous tools to plan, deliver, teach and assess language through learning management systems and various Web 2.0 tools, culminating in the creation of a sample course plan and sample module for a prospective online language course.

Grading Basis: Letter Grade

LGTC 5040 (2) Telecollaboration for Language Learning Foundations

Trains foreign language faculty and instructors in dual immersion language learning via telecollaboration. This course is offered online summer semesters (B Term) through the School of Continuing Education.

Grading Basis: Letter Grade

LGTC 5045 (1) Telecollaboration Exchange for Language Learning

Requires that students conduct a total of 10, 50-minute long virtual immersions (through a video conferencing tool) with a language partner. Students will receive assistance to find a partner. Must be repeated for a total of 2 credit hours for certificate students. Offered online fall and spring semesters through the School of Continuing Education.

Repeatable: Repeatable for up to 2.00 total credit hours.

LGTC 5050 (3) Language Technology Practicum

Select, design, implement and assess a capstone instructional technology project of significance. Students will work closely with their advisor at each stage of the project and develop an online multimedia portfolio. This course is offered online spring semesters through the School of Continuing Education.

Grading Basis: Letter Grade

Latin Language (LATN)

Courses

LATN 1014 (4) Beginning Latin 1

Introduces basic grammar and vocabulary. For students with no previous knowledge of Latin.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Latin

LATN 1024 (4) Beginning Latin 2

Completes the presentation of grammar, incorporates review of fundamentals, and introduces reading of literature. For students with previous experience of Latin.

Recommended: Prerequisite LATN 1014.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Latin

LATN 2004 (3) Accelerated Latin 1

Intensive introductory course in Latin including a survey of grammar and practice reading and writing. No previous knowledge of Latin is required.

Additional Information: Departmental Category: Latin

LATN 2044 (3) Accelerated Latin 2

Continuation of LATN 2004. Reading of advanced texts: Caesar, Cicero, Ovid and others.

Recommended: Prerequisite LATN 2004.

Additional Information: Departmental Category: Latin

LATN 2114 (4) Intermediate Latin 1

Readings from Caesar and/or Cicero, with review of grammar.

Recommended: Prerequisite LATN 1024.

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Latin

LATN 2124 (3) Intermediate Latin 2

Selections from Virgil's Aeneid with attention to literary form and context as well as advanced grammar and syntax.

Recommended: Prerequisite LATN 2114.

Additional Information: Departmental Category: Latin

LATN 3014 (3) Introduction to Latin Prose

Author or topic in Latin specified in the online Schedule Planner (e.g., Cicero, Livy, Pliny). Formerly CLAS 3014.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Latin

LATN 3024 (3) Introduction to Latin Poetry

Author or topic in Latin specified in the online Schedule Planner (e.g., Virgil, Ovid, Catullus, Horace).

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: Latin

LATN 4014 (3) Topics in Latin Prose

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

Equivalent - Duplicate Degree Credit Not Granted: LATN 5014

Repeatable: Repeatable for up to 9.00 total credit hours.

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4024 (3) Latin Prose Composition

Reviews grammar and syntax. Introduces Latin prose style and composition.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5024

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4044 (3) Topics in Latin Poetry

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

Equivalent - Duplicate Degree Credit Not Granted: LATN 5044

Repeatable: Repeatable for up to 9.00 total credit hours.

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4084 (3) Survey of Roman Literature Part 2: Imperial

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5084

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4094 (3) Survey of Roman Literature Part 1: Republican to Augustan

Introduces Roman literary history from its origins to the 30s BCE.

Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5094

Recommended: Prerequisites LATN 3014 and LATN 3024.

Additional Information: Departmental Category: Latin

LATN 4824 (3) Latin Teaching Methods: Open Topics

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

Equivalent - Duplicate Degree Credit Not Granted: LATN 5824

Additional Information: Departmental Category: Latin

LATN 4844 (1-3) Independent Study

Formerly CLAS 4844.

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: Latin

LATN 5014 (3) Topics in Latin Prose

Author or topic in Latin specified in the online Schedule Planner (e.g., Roman historians, Roman epistolography, Cicero, Roman novel).

Equivalent - Duplicate Degree Credit Not Granted: LATN 4014

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5024 (3) Latin Prose Composition

Reviews grammar and syntax. Introduces Latin prose style and composition. Formerly CLAS 5024.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4024

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5044 (3) Topics in Latin Poetry

Author or topic specified in Latin specified in the online Schedule Planner (e.g., Roman elegy, Neronian poetry, Lucretius, Roman satire).

Equivalent - Duplicate Degree Credit Not Granted: LATN 4044

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5084 (3) Survey of Roman Literature Part 2: Imperial

Covers Imperial Roman literary history from the mid-late Augustan Period to the start of Late Antiquity. Students read principal surviving works of Imperial Roman poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4084

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5094 (3) Survey of Roman Literature Part 1: Republican to Augustan

Introduces Roman literary history from its origins to the 30s BCE.

Students read principal surviving works of the Roman Republican poetry and prose in the original Latin.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4094

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5404 (3) Special Project: Teaching

Trains students to prepare classroom-ready materials, which are then tested in the students' own classroom. Required of master's candidates (teaching of Latin option). Formerly CLAS 5404.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 5824 (3) Latin Teaching Methods: Open Topics

Covers specialized topics in Latin pedagogy specified in the online Schedule Planner.

Equivalent - Duplicate Degree Credit Not Granted: LATN 4824

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 6004 (3) Graduate Reading

Author or topic specified in the online Schedule Planner. Formerly CLAS 6004.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 6844 (1-3) Graduate Independent Study

Formerly CLAS 6844.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

LATN 7014 (3) Graduate Seminar in Latin Literature

Formerly CLAS 7014.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Latin

Law School (LAWS)

Courses

LAWS 4005 (3) Constitutional Law: Founding Principles and Current Debates

Explores the principles underlying the United States Constitution and offers an introduction to the powers of the three branches of the federal government and the interrelationship of state and national governments. Includes an introduction to the individual rights protected by the Bill of Rights and the operation of the Fourteenth Amendment's due process and equal protection clauses.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 4007 (3) Federal Income Taxation of Individuals

Designed to provide an introduction to federal income taxation of individuals.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 4017 (3) Introduction to Business Taxation

Provides a comprehensive introduction to the taxation of business activity and entities, including: 1) overview of principles of income taxation; 2) choice of entity; 3) formation, operation and dissolution of entities; 4) taxable and tax-deferred acquisitions; and 5) overview of international taxation. There are no course prerequisites.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 4075 (3) Introduction to American Law

Introduces undergraduate students to the American legal system and to legal reasoning and argumentation via case studies of prominent litigation. Students will learn basic conceptual building blocks of American law, basic lawyering skills and an understanding of how the American legal system structures and resolves complex disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 4201 (1) Philosophy of Entrepreneurship

Explores how entrepreneurship principles apply in a variety of life's contexts, ranging from startup companies to legal practice to developing one's own professional brand. Participants consider whether adoption of entrepreneurial principles - viz., a philosophy of entrepreneurship - is a useful way to approach problem solving, management issues, career strategies and other life challenges.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 4211 (3) Corporate Law

Covering foundations legal issues in corporate law. Topics may include the nature and purpose of the corporate form, the relationship between shareholders and management, the fiduciary duties of directors, securities regulation and mergers and acquisitions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 4226 (3) Professional Communication in Business

Aims to teach students the rhetorical principles and writing practices necessary for producing effective business letters, memos, e-mails, reports and collaborative projects in professional contexts. The curriculum is informed by current research in rhetoric and professional writing and is guided by the needs and practices of business, industry and the professions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 4458 (2-3) Introduction to Law and Literature

Explores the intersection between law and literature and will provide an opportunity to think about the law by reading engaging works of fiction and non-fiction, viewing important films and examining the law from a humanistic and philosophical perspective.

Grading Basis: Letter Grade

LAWS 4618 (2) Marijuana Law in Colorado

Explores the aspects of marijuana's history, pharmacology, potential harms and medical uses needed for intelligent study of governing law. Discusses the Federal statutory law classifying marijuana as a Schedule 1 forbidden drug and Colorado's medical and recreational laws permitting marijuana use on specific conditions and the conflicts between the two.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 4700 (3) Native American and Indigenous Peoples Law

Examine international law in the context of the adoption of the United Nations Declaration on the Rights of Indigenous Peoples, which represents a global consensus on adopting a human rights based approach to Indigenous Peoples. Explores how the domestic and international regimes intersect and are developing, as well as implications for future work and we will also look to the development of laws by Native American and indigenous peoples themselves.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 4801 (2-3) Technology, Law and Society

Provides a comprehensive and rigorous overview of contemporary challenges and opportunities introduced by evolving technology. From the Internet to drones, robotics to smartphones, and machine learning to video games, recent advances in technology put pressure on venerable societal institutions. This class focuses on the technology and the institutions, giving a deeper understanding of how each evolve and react to changes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 5064 (2) Legal Analysis

Designed to help students develop the analytical skills necessary for success in law school and on the bar exam. Students will strengthen their core analytical skills, written communication skills, and ability to retain information. The ability to engage legal questions at the highest level is a skill that can be practiced and improved.

Requisites: Restricted to Professional Year 1 Law students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 5103 (1) Legal Ethics & Professionalism: What Kind of Lawyer Do You Want to Be?

Explores both the kind of law students might decide to practice and the ethical, personal and professional commitments central to the practice of law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 5121 (4) Contracts

Covers basic principles of contract liability, offer, acceptance and consideration, statute of frauds, contract remedies, the parole evidence rule, performance of contracts, conditions, effect of changed circumstances, third-party beneficiaries, assignment and specific performance.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 5201 (1) Entrepreneurship, Innovation and Public Policy

Explores cutting edge questions around entrepreneurship, including being an entrepreneur, leadership and what makes a great founding team, building and scaling a business, entrepreneurial communities, financing entrepreneurial companies, leadership in government, entrepreneurship and innovation policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Business

LAWS 5203 (1) Legal Ethics, Professionalism and Creative Problem Solving

Developing reflective, creative problem solving and ethical legal professionals by touching a core set of issues facing lawyers, including the duty of confidentiality to clients and the hazard of conflicts of interest, providing students with an opportunity to confront these challenges in an interactive and engaged environment.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Electives

LAWS 5205 (3) Legislation and Regulation

Introduces lawmaking in the modern administrative state. Examines the way Congress and administrative agencies adopt binding rules of law (statutes and regulations, respectively) and the way that implementing institutions, courts and administrative agencies, interpret and apply these laws. Considers the structure of the modern administrative state, the incentives that influence the behavior of the various actors, and the legal rules that help to structure the relationships among Congress, the agencies and the courts.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 5211 (1) Framing and Legal Narrative

Thinking through the fundamental concepts that inform and animate different areas of law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

LAWS 5223 (2) Legal Writing II

Students prepare appellate briefs and related documents and deliver oral arguments before a three-judge court composed of faculty, upper-division students, and practicing attorneys. Practice arguments are videotaped and critiqued.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5226 (2) Legal Writing I

Provides an intensive introduction to the resources available for legal research. Students also prepare written material of various kinds designed to develop research skills, legal writing style, and analysis of legal problems.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 5303 (4) Civil Procedure

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5313 (3) Civil Procedure 2

Studies modern practice in civil suits, including rules governing pleading, joinder of parties, discovery, jurisdiction of courts over the subject matter and parties, right to jury trial, appeals, and res judicata and collateral estoppel, with emphasis on the Federal Rules of Civil Procedure and their Colorado counterpart.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5323 (1) Courtroom Observation Civil

An elective that requires 15 hours observing actual civil proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 5425 (3) Torts

Studies nonconsensual allocation of losses for civil wrongs, focusing primarily on concepts of negligence and strict liability.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 5503 (4) Criminal Law

Studies statutory and common law of crimes and defenses, the procedures by which the law makes judgments as to criminality of conduct, the purposes of criminal law, and the constitutional limits upon it.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 5513 (1) Courtroom Observation Criminal

An elective that requires 15 hours observing actual criminal proceedings in a courtroom, attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. Figuring out how to gain access to appropriate proceedings is part of the student's work, although the professor is available for advice and guidance.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 5624 (4) Property

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 5634 (2-3) Property 2

Topics include personal property, estates and interests in land, landlord-tenant, basic land conveyancing, and private land use controls.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 5646 (1) Foundations of Legal Research

Moves students from the brief introduction to legal research offered in the first-year legal writing classes to the sort of problem-centered research students will perform starting in the summer after their first year. Provides students with a conceptual understanding of the organization and connectivity of legal authority and with instruction in research methodology at both the project and resource levels.

Requisites: Restricted to Professional Year 1 Law students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 5803 (1) Courtroom Observation International

An elective that requires fifteen hours observing proceedings before an international tribunal(s), attending a two-hour class meeting every other week, preparing and submitting a journal of recorded observations. The proceedings observed will be available streaming online and the professor will provide information about how to gain access to them.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6001 (4) Commercial Transaction

Grading Basis: Letter Grade

LAWS 6002 (3) Public Land Law

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

Requisites: Requires prerequisite course of LAWS 6112 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6004 (3) Real Estate Transactions

Focuses on legal issues that arise in all phases of real estate transactions, with an emphasis on the role of the lawyer in the business of real estate as well as on the regulation of real estate markets.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 6005 (4) Constitutional Law

Studies constitutional structure: judicial review, federalism, separation of powers; and constitutional rights of due process and equal protection.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6007 (4) Income Taxation

Emphasizes the fundamentals of the federal income tax system and examines its impact on the individual.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6700

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6008 (3) Foundations of International Legal Thought

Provides students with a broad historical and philosophical introduction to international law. Addresses changing conceptions of sovereignty between 1492 and World War II, in the contexts of the Spanish conquest of the Americas, the international legality of the slave trade, relations between the Ottoman Empire and the "Great Powers", the Chinese opium wars and the rise of modern international institutions.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6009 (4) Legal Aid Civil Practice 1

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material.

Develops working knowledge of courtroom skills.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6011 (3) Payment Systems

Examines the methodology and policies of Articles 3 and 4 of the Uniform Commercial Code, dealing with such topics as negotiable instruments, bank deposits, collections, letters of credit and electronic fund transfers.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6019 (4) Civil Practice Clinic 2

Emphasizes procedural and practical remedies and defenses available in civil litigation. Assigns civil cases related to the course material. Develops working knowledge of courtroom skills.

Requisites: Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6021 (3) Secured Transactions

Explores the methodology and policies of Article 9 of the Uniform Commercial Code, dealing with financing transactions in personal property.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6024 (3) Real Property Security

Examines basic mortgage law, including use of mortgage substitutes (e.g., deeds of trusts and installment land contracts). Covers foreclosure and redemption and related problems; special priority problems in land acquisitions and construction financing; special financing devices, including variable-interest and wraparound mortgages; and problems relating to the transfer of the mortgagor's and mortgagee's respective interests.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property, Trust and Estate and Land Use

LAWS 6029 (4) Criminal and Immigration Defense Clinic

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6031 (2) Consumer Protection Laws and Policies

Focuses on deceptive trade practices and consumer rights. Reviews the law of deception/misrepresentation at common law, and federal and state laws regarding unfair acts and practices. Covers credit practices, environmental and health claims, and telecommunications and privacy. Discusses remedies, including governmental enforcement actions, and individual and class actions.

Grading Basis: Letter Grade

LAWS 6035 (3) White Collar Crime

Examines distinctions between white collar crime and other types of criminal activity and the needs for and arguments against white collar laws and law enforcement. Studies securities fraud, mail and wire fraud, insider trading, money laundering, false statements, conspiracy and criminal forfeiture statutes. Includes use of the grand jury, privileges applicable in the corporate setting, immunity, discovery and the impact of parallel civil proceedings. Examines effect of government policy on corporations and their counsel, pre-trial and trial strategy, jury selection and victim notification and restitution options.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6039 (4) Criminal Defense Clinic 2

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants in Boulder courts. Develops working knowledge of courtroom skills.

Requisites: Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6045 (3) Criminal Procedure

Focuses primarily on the constitutional limitations applicable to such police investigative techniques as arrest, search, seizure, electronic surveillance, interrogation and lineup identification.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6049 (4) Legal Assistance 1: Federal Courts

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

Grading Basis: Letter Grade

LAWS 6055 (3) Post-Conviction Criminal Procedure

Addresses sentencing process and schemes, direct appeals, probation modification and revocation, parole revocation, pardon and commutation processes, post-conviction litigation and appeal in both state and federal court, federal review of state convictions through habeas and/or the AEDPA, and ethical issues that arise in post-conviction proceedings.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6059 (2-3) Legal Aid and Defender

Grading Basis: Letter Grade

LAWS 6060 (3) White Collar Crime Practicum

Addresses the non-trial portion of white collar criminal law. Drawing examples and problems from wire fraud, securities fraud, health care, and computer fraud contexts, explores a white collar case's major investigative and charging phases, corporate and organizational issues, as well as pleas and punishment.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6065 (3) Media, Popular Culture, and the Law

Examines how the institutions, practices, and the very identity of the law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed is: to what extent, and how are the forms and methods of the new media, having an effect on the perception, role and identity of law?

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6069 (4) Immigration Clinic

Emphasizes practice skills in immigration cases. Includes litigation before Federal Immigration judges, Board of Immigration Appeals, and Federal Circuit Court of Appeals.

Requisites: Requires prerequisite or corequisite course of LAWS 6353 (minimum grade D-).

Grading Basis: Pass/Fail

LAWS 6079 (4) Criminal Defense Clinic

Provides thorough grounding in problems of criminal defense. Students defend indigent misdemeanants. Develops working knowledge of courtroom skills, advocacy and evidence presentation. Concludes with full mock trial.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6089 (4) Legal Assistance 2: Federal Courts

Studies evidence and procedural issues, discovery (including document management), pretrial preparation, motions, pretrial conferences, and jury selection. Focuses on opening and closing statement strategies, elements of direct and cross-examination, and impeachment; how to present evidence using technology, including presentation software. Students participate in preparing and arguing motions in federal court and may participate in trial proceedings.

Grading Basis: Letter Grade

LAWS 6099 (4) Family Law Clinic

Represents low-income clients in family law cases in local state district court. Students will gain court-based experience in dissolution's and allocations of parental responsibilities. Seminar component includes instruction on substantive family law, related ethical issues, and theoretical backgrounds of poverty lawyering.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation, Negotiation Alt Dispute Resolution

LAWS 6103 (2-3) Legal Ethics Professionalism

Examines the legal profession as an institution, its history and traditions and the ethics of the bar with particular emphasis on the professional responsibilities of the lawyer. Discusses the Model Rules of Professional Conduct.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6104 (3) Wills and Trusts

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 6105 (2) Defending Immigrants in Criminal and Immigration Courts

Addresses legal procedures, pleadings and client advocacy matters involved in the representation of Spanish-speaking clients who have been arrested for criminal offenses and who have been issued a detainer by Immigration and Customs Enforcement for possible immigration removal proceedings. Provides overview of criminal defense concepts, and how criminal defense attorneys must be prepared to competently counsel their clients who are facing removal proceedings in the federal immigration system.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 6108 (3) Conflict of Laws

Addresses the conflicts that arise when the significant facts of a case are connected with more than one jurisdiction, whether that jurisdiction belongs to a state, the federal government, or a foreign government. The subject is studied in its theoretical and historical context, with special emphasis on the international aspects of extraterritorial jurisdiction.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6109 (2) Trial Advocacy

Focuses on voir dire, opening statement, direct examination of witnesses and cross examination.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6112 (3) Foundations of American Natural Resources Law

Introduces students to the law of natural resources. Examines the legal, historical, political, and intellectual influences that shape resources development and conservation.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6113 (2) Legal Ethics and Professionalism: Ethics and the Law of Lawyering

Continuation of LAWS 5103. Focuses on the Model Rules of Professional Conduct. Provides the nuts and bolts of the ethical rules needed to begin to explore externships, clinics, pro bono projects and other practice experiences during law school.

Requisites: Requires prerequisite course of LAWS 5103 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6114 (2) Construction Law

Focuses on the basic principles and practices of construction law. Provides an overview of construction industry participants and players (engineers, contractors, insurers) and discusses and analyzes the various obligations and liabilities of these parties. Covers construction and design contracting, construction claims, professional negligence, construction insurance and suretyship and ADR in construction. Provides transactional-practice oriented exercises.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 6117 (3) Survey of Business Enterprise Tax

Makes a comparative survey of federal income taxation of C corporations, S corporations, and partnership/limited liability companies, the principal entity choices for conducting business in the United States. Includes formation, operations, distributions, sales of interests, and liquidation. Suitable for students seeking introductory background for business or real estate practice, without the detail required for a tax specialist.

Requisites: Requires prerequisite course of LAWS 6007 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 6119 (1) Deposition Skills

Provides valuable skills to assume active roles in the deposition process. Explores why and when to take depositions; drafting and objecting to deposition notices for individual deponents, non-party witnesses and corporate designees; drafting successful outlines, proper questions and objections; using exhibits; furthering case theory, making and using stipulations; using depositions in pretrial motions and at trial.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6122 (2) International Natural Resources Law and Policy

Examines the suite of policy issues and legal ramifications associated with sustainable natural resource development. Examines most recent research on the "resource curse" theory. Examines recent policy developments and discussions that have occurred among industry, NGOs, multilateral development agencies and governments. Examines issues related to bribery and corruption in developing country environments and dispute resolution mechanisms at national and local levels.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment Natural Resources

Departmental Category: International Comparative Law

LAWS 6123 (2) Legislative and Policy Drafting

Exposes students to the process of drafting and amending enacted legal texts such as statutes, regulations, and polities of both governmental and non-governmental entities. Students will critically examine lawyers' roles as counselors, advocates and experts in different legislative and policy-drafting contexts.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6128 (1-3) Statutory Interpretation

Examines theories of legislation and the relation between legislatures and courts, emphasizing problems of statutory interpretation and other issues in the judicial use or misuse of statutes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6138 (2-3) Federal Tax Politics

Studies the tax system as the nexus of politics and economics. Examines how various interests and entities use the many tools of political power to shape the tax system. Intended for those interested in politics and legislation, rather than for the tax specialist.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6157 (3) Corporate Taxation

Studies federal income taxation related to taxable corporations, the entities through which a large part of the economic activity in the U.S. is conducted. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6450

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6167 (3) Partnership Taxation

Studies federal income taxation of pass-through entities such as are used by most small businesses in the U.S. Includes creation, operation, distributions, sale of interests and liquidation.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6430

Requisites: Requires a prerequisite course of LAWS 6007 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 6170 (1) E-Discovery

Exposes students to the legal and practical challenges presented by E-discovery and how electronically stored information shapes litigation and the pretrial process. Students gain an understanding of how electronically stored information can impact an overall discovery strategy and how this complicates a lawyer's ethical and professional obligations.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6179 (2) Trial Practice

Students apply the rules and doctrine of evidence in simulated trial settings. Must be taken with the corresponding section of Evidence. Satisfies the trial practice requirement and counts 2 hours toward the 14 credit hour maximum of clinical hours counted toward graduation.

Grading Basis: Letter Grade

LAWS 6201 (3-4) Agency, Partnership, and the LLC

Surveys agency law whose principles are important in many other areas of law. Studies the legal organizations commonly used by small businesses: partnerships and limited liability companies (LLCs).

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6205 (3) Lawyers for Social Change

Helps students expand their perspective to understand the ways in which lawyers more broadly participate in social change work in this service learning class. Analyzes case histories of cause lawyering. The service learning component is based on the precept that one of the most effective ways to learn a role is to perform that role. Students will participate as social change lawyers by working with a local community to help it develop projects that the community believes will help it better itself.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 6206 (3) Litigation Drafting

Examines the intersection of civil procedure and legal writing. Emphasizes the drafting of persuasive adversarial litigation documents, including complaints, answers, motions in limine, motions to dismiss, motions of summary judgment, and jury instructions. Intensive writing and workshop format.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6207 (2) Writing in the Regulatory State

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Grading Basis: Letter Grade

LAWS 6209 (4) Sustainable Community Development Clinic

Provide legal and policy advice, guidance and representation related to sustainable development with a focus on fostering social enterprise, healthy communities and poverty reduction.

Grading Basis: Letter Grade

LAWS 6210 (2-3) Comparative Law

Considers foreign solutions to certain key legal problems. Focuses on general problems of legal process, rather than on substantive rules. Topics include the role of lawyers, civil dispute resolution, criminal procedure and employment discrimination. Covers different legal systems in different years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6211 (3) Corporations

Covers formation of corporations and their management; relations among shareholders, officers and directors; the impact of federal legislation on directors' duties; the special problems of closed corporations.

Requisites: Restricted to Professional Year 1, 2, or 3 Law students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6213 (2) Advanced Appellate Advocacy

Advanced study and practice of written and oral appellate advocacy. Builds on the foundation established in the required first-year course in appellate advocacy, but provides more extensive coverage, practice and evaluation. Personalized instruction in brief writing, including detailed, one-on-one critique of their work. Include advanced techniques for organizing and writing a brief, and advanced instruction on the strategy and process of oral argument. Required to research, write, and rewrite, an appellate brief and conduct several oral arguments. Attend oral arguments of the United States Court of Appeals for the Tenth Circuit and the Colorado Court of Appeals.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6220 (3) Introduction to Jewish/Israeli Law

Outlines the history and basic principles of Jewish Law, Halakhic system that encompasses Biblical law and the Rabbinic law. Covers Legal Sources of the Jewish laws, interpretation, legislation, custom, precedence and legal reasoning. Explores the study of modern legal system of the state of Israel and examines the problematic nature of the incorporation of the Law of personal status in the Rabbinical and in general courts.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6221 (3) Compliance

Covers requirements for corporate compliance programs and key components of them, including the role of audit committee, internal audit and ethics and compliance. Looks closely at different compliance regimes, including Sarbanes Oxley, the privacy and security components of the Health Insurance Portability and Accountability Act of 1996 (HIPAA), the evolution of other data privacy standards and the anti-corruption standards of the Foreign Corrupt Practices Act and the UK Bribery Act.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6223 (3) Research and Writing in the Regulatory State

Focus on developing in students the research, writing and analytical skills necessary to operate within any highly regulated field. Students will work broadly on research and writing skills required in a regulatory practice and narrowly on how that applies to particular areas of expertise, to gain an understanding of a particular area of the law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6226 (1-3) Advanced Legal Research and Writing

Builds on skills learned in the first-year legal writing course to improve written legal analysis. Students will complete multiple written assignments and will receive individual feedback on their work. Sections vary significantly depending on the professor; please check the Legal Writing page of the Colorado Law website to read each professor's course description.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6236 (2) Judicial Opinion Writing

Places contemporary American judicial opinion in historical and comparative context. Analyzes individual and institutional writing choices that authors of judicial opinions must make and ethical dilemmas they must confront. Builds upon the first-year legal-writing curriculum. Challenges students to develop and defend their own opinion-writing approaches and styles as well as to write from approaches and in styles that are not their own.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6246 (2) Introduction to United States Legal System/Legal Reasoning, Research and Writing

Introduces students without a law degree to the basic structure and content of the United States legal system, examining how the three branches of government at the state and federal levels make law and policy in the United States. The course will provide a basic introductory overview of the following: the various sources of law, including an understanding of how statutes are enacted by legislative institutions; the role of the United States court system in interpreting laws; application of judicial precedent in common-law systems; trial and appellate court procedures; and judicial review standards. The course will also introduce students to the methodology of American law, including legal reasoning, research, and writing, through a variety of in-class and outside research and writing assignments.

Grading Basis: Letter Grade

LAWS 6251 (4) Corporations

Covers formation of corporations and their management; relations between shareholders, officers, and directors; the impact of federal legislation on directors' duties; and the special problems of closed corporations.

Grading Basis: Letter Grade

LAWS 6270 (2) Law and Mathematics

Basic mathematical concepts relevant to law: proportions, exponential growth/interest, present value calculations, probability, DNA evidence, basic statistics. Intended especially for students who lack confidence in their math skills, but all are welcome. Basic calculations will be learned, but emphasis will be on the concepts behind mathematical techniques and on relationships between evidence, calculation and truth.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 6271 (1-2) Special Topics: Deals Lab

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite LAWS 6211.

Grading Basis: Letter Grade

LAWS 6280 (1) Intensive Intro to Financial Info, Accounting and the Law: Accounting Boot Camp

Exposes students to the basics of financial accounting and when and how lawyers encounter accounting problems. Students will leave the course with an understanding of the basic framework of accounting, including the double-entry method, balance sheets, income statements, and statements of cash flows, time value of money, discount rates, basic methods of business valuation, and risk and diversification concepts.

Grading Basis: Letter Grade

LAWS 6281 (3) Accounting Issues for Lawyers

Studies accounting and auditing problems in the form they are placed before the lawyer, including a succinct study of basic bookkeeping, in-depth legal analysis of the major current problems of financial accounting, and consideration of the conduct of the financial affairs of business.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6301 (3) Introduction to Intellectual Property

Provides an overview of our nation's intellectual property laws, including patents, copyrights, trademarks and trade secrets. Discusses other matters related to intellectual property, including licensing, competition policy issues and remedies.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5245

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6302 (3) Water Resources

Analyzes regional and national water problems, including the legal methods by which surface and ground water supplies are allocated, managed and protected.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6308 (2) Law and Neuroscience

Covers neuroscience basics and explores the relationship between the law and recent neuroscientific discoveries in domains including pain, memory, lie detection, psychopathy and criminal responsibility.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6311 (1) National Security and Privacy Law

Introduces national security and privacy law and relevant law, regulations, rules, policies, and guidelines.

Grading Basis: Letter Grade

LAWS 6315 (2) The Prosecutor's Role in the Criminal Justice System

Designed to familiarize students with the professional and ethical duties of the prosecutor in the criminal justice system, with the goal of encouraging students to think about the role that prosecutors play. While the focus of the materials and presentations will center on the Colorado criminal Justice system, the concepts and principles addressed translate to all state systems and the federal system. National trends and legislative policy decisions related to criminal law, and their potential impact on public safety and prosecution efforts will also be discussed.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Criminal

LAWS 6318 (3) Economic Analysis of Law

Introduces the basic elements of economic theory and emphasizes demand and utility, cost and optimality.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6321 (3) Computer Crime

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront as they respond to recent explosions in computer-related crime. Includes the Fourth Amendment in cyberspace, the law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal/state relations in enforcement of computer crime laws, and civil liberties online.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6328 (3) Financial Decision-Making

Applies concepts, ideas, insights and principles of modern finance to real-world situations that lawyers will face in many areas of law. Analyzes present discounted value (time value of money), risk versus return, asset diversification, portfolio theory, efficient markets hypothesis, arbitrage, financial options, real options, financial signals, human capital, behavioral finance, socially responsible investing, neurofinance, happiness finance and financial bubbles and crashes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6331 (1) The Technology of Privacy

Explores the escalating debates by policymakers, scholars, advocates and industry representatives about the growing spread of tracking and surveillance in society. Debates are being spurred by the pace of changes to technology and particularly of changes to Internet and mobile technology. Practitioners in information privacy law or technology policy must understand the past, present, and likely future, of the technology of privacy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 6338 (1) Understanding the Global Financial Crisis

Explores the causes and consequences of the global financial crisis. Analyzes financial instruments and institutions at the heart of the crisis – including asset-backed securities, credit derivatives, government-sponsored entities, credit rating agencies, hedge funds, and financial conglomerates – and places them in the context of a larger "shadow banking system". Examines the building blocks of financial reform.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6353 (3) Evidence

Studies the methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6361 (2) Information Privacy

Explores the laws that regulate the basic technologies of the internet and the management of information in the digital age. It examines the most significant statutes, regulations and common law practices that comprise this emerging legal framework.

Grading Basis: Letter Grade

LAWS 6363 (5) Evidence and Trial Practice

Studies methods and forms of proof in litigation, including detailed consideration of hearsay, impeachment of witnesses, relevancy and certain restrictions on authentication and best evidence doctrines, and privileges. Applies rules and doctrine of evidence in simulated trial settings. Combined Evidence and Trial Practice course. Satisfies the trial practice requirement and counts two hours toward the 14 credit hour maximum in clinical hours.

Grading Basis: Letter Grade

LAWS 6373 (3) Federal Litigation: Everything but the Trial

Litigates through all pretrial phases as plaintiff's counsel, a mock federal case: an employee's challenge to compensation and termination, with possible claims including breach of contract, breach of the implied covenant of good faith and fair dealing, violation of wage payment statutory and regulatory requirements, and fraudulent inducement to contract.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6400 (3) International Law

Examines the nature, structure and sources of international law, the relationship between international law and domestic U.S. law, the role of international organizations such as the United Nations, the methods of resolving international disputes, the bases of international jurisdiction, and select substantive areas of international law that may change from semester to semester.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6401 (1) Foreign Corrupt Practices, Anti-Bribery and Anti-Trafficking

Examines Foreign Corrupt Practices Act and similar legal regimes that target bribery and trafficking.

Grading Basis: Letter Grade

LAWS 6410 (3) International Trade Law

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6415 (2-3) Drug Product Liability Litigation: Principles and Practice

Explores product liability lawsuits and litigation. Explores law of product liability and the tools necessary to successfully litigate these cases. Considers the theory and practice of lawsuits now and after the Supreme Courts landmark decision in Wyeth v. Levine (2009). Focuses on similarities and differences between the special context of FDA regulation. Considers the legal principles governing such lawsuits such as inadequate warning, the Learned intermediary Doctrine and medical causation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business and Commercial Law

LAWS 6420 (1) Law and the Holocaust

Explores comparative law, jurisprudence, conflicts of laws and international law. Examines the Nazi philosophy of law emanating from its egregious racial ideology, and how it was used to pervert Germany's legal system to discriminate against, ostracize, dehumanize and eliminate certain classes of people. Studies the role of international law in rectifying the damage by bringing perpetrators to justice and constructing a legal system designed to prevent a repetition.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6458 (2) Creative Writing for Lawyers

Requires substantial writing and reading. Begins with participants bringing to class a piece of creative writing consisting of three to five thousand words. Each session consists of one hour of discussion and critique of an assigned writing exercise that everyone has prepared for the class, and one hour of workshop critique of each participant's longer work, in turn.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6501 (2-3) The Practice of Labor and Employment Law

Focuses on aspects of the practice of employment law, rather than the examination of legal doctrines. Discusses typical issues presented in advising and litigating on behalf of employers and employees. Topics include special attention to ethical issues.

Grading Basis: Letter Grade

LAWS 6502 (2) Wildlife and the Law

Examines the law that protects wildlife, its habitat and biodiversity. Explores human-caused threats including habitat destruction, illegal trade and climate change. Focuses on statutes, case law, environmental ethics, and current controversies to highlight legal, scientific and political strategies for protecting biodiversity. Particular emphasis is placed on the U.S. Endangered Species Act.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6503 (3) Law and Social Sciences

Explores disparities in criminal sentencing and death penalty cases; quality and effectiveness of legal representation for indigent criminal defendants; relationship between modifications in traditional steps in legal process; connection between alternative tort doctrines and volume of litigation, trial rates, plaintiff success rates and award size; impact of congressional statutes and US Supreme Court decisions on handling and outcomes of habeas corpus petitions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6508 (1) The Philosophy of Law

Questions the nature of law, characteristics and considerations of a legal system, rights and from where they come; thinking like a lawyer, basic techniques of legal reasoning, difference between doctrinal and normative legal analysis. Explores law's frontier and what distinguishes law from morality or politics. Focuses on influential texts from the end of WWII to the end of the Cold War.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6510 (2-3) International Environmental Law

Examines international environmental law, including transboundary impacts and global issues. Addresses such issues as intergenerational equities, principles of compensation, and if international environmental norms should receive special environmental norm consideration. A course in public international law is not a prerequisite, but students who have not taken such a course will probably find it useful to do some additional background reading. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6511 (2-3) Labor Law

Relates to labor unions and other collective aspects of employment, including the right of workers to form and join unions, to provoke collective bargaining and to strike and engage other forms of protest. Focuses on domestic law at the federal level and with a particular statute, the National Labor Relations Act, and the workings of particular agency, the National Labor Relations Board. Engages other sources of law, including constitutional law, as well as judicial decisions and other statutes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6513 (2) Crime Victims Rights and Victim Counseling and Advocacy

Involves highly experiential and participatory form of learning related to the rights and needs of victims of crime. Legal and constitutional aspects of crime victims' rights and advocacy are considered. Includes a training component by Moving to End Sexual Assault, a Boulder based organization. After training by MESA, students will complete 120 hours of volunteer service on the MESA hotline as well as attend various meetings.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 6518 (3) Introduction to Islamic Law

Examines the Formative Era of Islamic Law, through its sources and methodologies. Examines the Established Era of the Schools of Law including differences between Sunni and Shiite Islamic Law. Examines human rights, terrorism, political Islam, women's rights and rights of religious minorities, criminal law, and finance law, and the growing role of fundamentalism in these areas. Examines the relevance of Islam and Islamic law in today's world.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6521 (3) Employment Law

Entails a survey of employment-at-will, workplace safety, workplace torts; ERISA and retirement, workers' compensation; controls on hours and wages; health insurance; disability and unemployment compensation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6525 (2-3) Elder Law

The counseling and legal representation of older persons and their representatives. Topics may include: legal aspects of health and long-term care planning, public benefits, surrogate decision making, legal capacity, the conservation, disposition, and administration of older persons' estates, the implementation of their decisions concerning such matters, and the broad ethical issues of representing clients in this field of practice.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 6528 (3) Capital Punishment in America

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6531 (3) Comparative Employment Law

In today's globalized world, lawyers are increasingly likely to encounter issues involving foreign employment. Provides substantive knowledge about foreign employment law and its relation to American law, as well as a comparative framework to assess the relative merits of the American approach to employment law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6540 (3) Global Law & Global Governance

Addresses contemporary theories of globalization. We will explore questions such as: What is globalization, and in particular, what is the globalization of law? What is the extent of legal globalization, and how can we know? Are global law and global governance good things? How are these categories any different from what has traditionally been called "international law"? Our search for answers will be guided by a selection of recent books from theorists of globalization and global governance, such as David Held, Immanuel Wallerstein, and David Kennedy.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 6541 (2) Colorado Worker's Compensation Theory and Practice

Introduces the legal theories that underlie the no-fault compensation system, its historical evolution, policy conundrums and ethical quandaries. Teaches the application of the procedural rules most frequently utilized in administrative setting. Studies the Workers' Compensation Act, the Workers' Compensation Rules of Procedure and the Office of Administrative Courts Rules of Procedure.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6551 (3) Employee Benefits and Compensation Law

Examines past and present employee benefits and compensation practices among private and public employers. Covers ERISA and defined benefit, defined contribution and welfare benefit plans; equity awards granted by corporations; equity awards granted by LLCs and partnerships; nonqualified deferred compensation and Section 409A of the IRS; golden parachutes and Sections 280G and 4999 of the IRC.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 6555 (2-3) Disability Rights

Examines doctrinal and practical dimensions of disability rights with particular focus on the Americans with Disabilities Act. Emphasizes not only substantive law in area but also applications, including litigation, counseling clients and working with other professionals (e.g., architects) on compliance.

Grading Basis: Letter Grade

LAWS 6601 (3) Corporate Transactions in Latin America

Introduces students to an overview of Latin American commercial and civil law systems, looking closely at Napoleonic and Chilean law. Explores the choice legal structures available for Latin American corporations; contract law that regulates business transactions in Latin America; and exploration of the way in which Latin American countries have joined international business trade agreements that pertain to Latin American nations such as the Vienna Convention and Gatt.

Grading Basis: Letter Grade

LAWS 6602 (3) Cultural Property Law

Concerns domestic and International regulation of property that expresses group identity and experience. Organized around traditional categories of property (real, personal and intellectual), covers historic preservation, archeological resources, art and museum law, with attention to indigenous people's advocacy on burial sites, traditional lands, ceremonies, music, symbols, ethnobotany, genetic information and language. May satisfy upper-level writing requirement.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6702 (1) Climate Justice

Introduces the field of climate justice and seeks to identify legal and policy tools for advancing fair outcomes in climate change decision making. Climate justice is concerned with the intersection of race and/or indignity, poverty, and climate change.

Grading Basis: Letter Grade

LAWS 6708 (1-3) Special Topics

Explores special topics in law.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 6712 (3) Climate Change Law and Policy

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions and key issues in policy design. Reviews the Supreme Court's April 2, 2007, decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes and the aftermath in the courts, Executive Branch and Congress.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6722 (3) Energy Law and Regulation

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments and the key federal statutes and regulatory regimes governing natural gas, electricity and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail competition.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6732 (3) Renewable Energy Project Finance and Development

Examines renewable energy and how legal topics impact financing projects. Reviews structure, regulation, and functioning of electric energy industry and laws applicable to development, ownership and operation of renewable energy projects across technologies. Addresses legal policy, economic and financing issues associated with expansion and improvement of the transmission grid to support renewable energy development.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 6801 (1) Anti-money Laundering Law

Explores domestic and foreign laws against money laundering, including know your customer and bank secrecy rules.

Grading Basis: Letter Grade

LAWS 6803 (3) Quantitative Methods

Equips students to deal effectively with experts, whether as consultants or as adverse witnesses, and to enable the identification of a quantitative issue. Helps students to become multi-dimensional in quantitative literacy. Enables students to be comfortable reading statistical arguments, performing basic analyses, writing about statistics, expressing quantitative ideas in graphs, questioning an expert, and understanding the power of computer programming.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 6813 (2) Problem-Solving, Professional Judgment, and Decision Making

Drawing from materials in psychology, behavioral economics, and mathematics, the course studies a range of patterns, fallibilities, and best practices concerning the complex problems commonly encountered by attorneys. Topics include general problem-solving strategies, techniques for operating in environments of uncertainty and complexity, empirically supported cognitive biases and errors, and strategies for recognizing and overcoming those errors.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6816 (1-2) Problem-Solving and Writing

Enhances students' ability to solve problems and writing concise coherent memos to clients or other legal documents outlining their legal analysis and strategic thinking. Uses diagnostic exams in which students are given multiple documents for fact patterns to begin their analysis.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6823 (1-2) Legal Reasoning

This course of seven 100-minute classes aims to present legal reasoning skills crucial to the crafting and criticism of legal arguments. The classes will cover seven topics: rules and standards, the art of the legal distinction, dealing with legal contradictions, facts and framing, level of abstraction, baselines, and legal interpretation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 6836 (1) Special Topics in Legal Research

Builds upon first-year legal research problem solving skills by exposing students to the nuances of research topics in a specialized topic and tracking related doctrinal classes, e.g., environmental and natural resources law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6856 (2-3) Advanced Legal Research

Offers an in-depth look at research resources and methods. Includes sources from the judicial, legislative, and executive branches of federal and state government; research in topical areas such as environmental law, taxation, and international law; and extensive coverage of secondary and nonlaw resources. Covers both print and electronic sources.

Students will have several assignments and a final project.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6866 (1) Colorado Legal Research

Surveys resources and methods to effectively research Colorado law. Covers primary and secondary resources including Colorado statutes, cases and digests, regulations, and constitution and practice materials. Covers how to research Colorado municipal law and other Colorado topics.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6876 (2) Legal Research Skills for Practice

Approaches legal research from a practice-focused perspective using hands-on sessions in the library. Instructs: how to find and use resources specific to a particular practice area; how to evaluate and weigh strengths and weaknesses of the various legal resources available; and, how to use legal resources efficiently. Includes research strategies and methods, primary and secondary resources, and research using library catalogs and Westlaw, Lexis, and other vendors.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6886 (3) Advanced Legal Research and Analysis

Develops students' ability to think critically about and solve current legal problems. Evaluates the benefits and detriments of both print and on-line legal resources, and how to create an efficient research plan. Formulates and applies research strategies to real-world legal problems, and uses legal analysis to refine and improve research results. Note: students who have taken LAWS 6856 may not enroll in this course.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 6896 (3) Advanced Legal Research and Writing for Practice

Advances and improves legal research and writing skills learned in first year. Proposes variety of assignment types across substantive and procedural areas to prepare for experiences as summer associates or new attorneys.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 7003 (3) Federal Courts

Looks at structure and jurisdiction of the federal courts, emphasizing problems of federalism and separation of powers and their relationship to resolution of substantive disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7004 (3) Advanced Deals Lab: Real Estate Transactions

Using documents from actual real estate transactions, this course will focus on the drafting and negotiation skills required for the successful practice of real estate transaction law. Students will negotiate and draft actual real estate transactional documents.

Requisites: Requires prerequisite course of LAWS 6004 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 7005 (3) Media Law

Surveys common, statutory, and regulatory law as applied to the mass media. Focuses on the law as it affects the gathering and publishing of news. Also examines the regulation of the electronic media.

Grading Basis: Letter Grade

LAWS 7011 (3) Creditors' Remedies and Debtors' Protections

Examines typical state rights and procedures for the enforcement of claims and federal and state law limitations providing protection to debtors in the process. Includes prejudgment remedies, statutory and equitable remedies, fraudulent conveyance principles and exemptions and other judicial protections afforded debtors.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7013 (2) Supreme Court Decision Making

Students deliberate over several important cases as "Justices" of the Supreme Court. Class is divided into three "Courts" with the first hour spent in deliberation and the second hour in discussion of the deliberative process as well as the substantive issues.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7015 (3) First Amendment

Examines speech and religion clauses of the First Amendment. Includes the philosophical foundation of free expression, analytical problems in First Amendment jurisprudence and the relationships between free exercise of religion and the separation of church and state.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7019 (1-2) Advanced Clinical Practicum

Enables a clinical student an optional 1-2 credit course to complete an ongoing clinic project that does not reach its natural conclusion during the regular term of the clinic. May be used in connection with any existing clinical course, but only with permission, and under the supervision of the clinical faculty member. A clinical student must complete a minimum of 50 hours of work per credit taken.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7021 (3-4) Bankruptcy

Briefly examines nonbankruptcy business rehabilitation devices, followed by basic principles of federal bankruptcy law and the bankruptcy court system. Concludes with attention to business reorganizations under Chapter 11 of the Bankruptcy Code.

Recommended: Prerequisites LAWS 6001 and LAWS 7011.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7023 (2) Jury Selection and History

Studies the history of the jury from ancient times through the implications of Apprendi, the grand jury from the time of Henry II through modern federal practice, and current jury selection procedures, both federal and Colorado, both civil and criminal. Experienced trial attorneys will work with students to demonstrate jury selection.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7024 (2-3) Real Estate Planning

Considers various contemporary legal problems involved in the ownership, use, development and operation of real estate. Emphasizes the income tax and financing aspects of commercial and residential use and development such as shopping plazas and apartment buildings.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 7025 (3) Civil Rights

Presents a comprehensive study of federal civil rights statutes briefly reviewed in other courses (e.g., Constitutional Law or Federal Courts). Studies federal civil rights statutes, their judicial application, and their interrelationships as a discretely significant body of law of increasing theoretical interest and practical importance.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7029 (3) Appellate Advocacy Clinic

Provides a clinical course that enables students to work on briefs of criminal cases being handled by the Appellate Division of the Public Defender or Attorney General's Office. Instruction in oral advocacy is given. Enrollment limited to eight students.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7031 (3) Regulation of Financial Institutions

Focuses on the core banking law and works outward to cover a broader spectrum of bank-like financial institutions. Covers bank licensing, restrictions on bank business, regulating safety and soundness of banks, consumer protection of depositors and other bank customers and regulatory examination and enforcement.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7045 (3) Criminal Procedure: Adjudicative Process

Focuses primarily on criminal procedure at and after trial. Looks at bail, prosecutorial discretion, discovery, plea bargaining, speedy trial, jury trial, the right to counsel at trial, double jeopardy, appeal and federal habeas corpus.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7051 (1-3) Transactional Drafting

Focuses on principles of contemporary transactional drafting. Skills gained will be applicable to transactional practice and will also be useful to litigators. Students will learn to translate, draft and review contracts, as well as how to add value to deals.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

LAWS 7055 (3) Education Law

Considers issues raised by the interaction of law and education. Issues may include the legitimacy of compulsory schooling, alternatives to public schools, socialization and discipline in the schools and questions of equal educational opportunities.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7058 (3) Conflict of Laws

Grading Basis: Letter Grade

LAWS 7061 (1) Contract Drafting

Begins with value creation by transactional lawyers and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps, and warranties, capitalized terms, definitions, indemnifications and escrow).

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Business

LAWS 7065 (3-4) Immigration and Citizenship Law

Covers legal issues pertaining to noncitizens of the United States, especially their right to enter and remain as immigrants and nonimmigrants. Topics include admission and exclusion, deportation, and refugees and political asylum. Approaches topics from various perspectives, including constitutional law, statutory interpretation, planning, ethics, history and policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7071 (2-3) Advanced Transactional Drafting

Provides students with the opportunity to further develop skills gained in LAWS 7051 and put them to use in simulations and business contexts across various areas of practice. Students will be asked to draft industry specific contract provisions, revise existing contracts, counsel and negotiate on behalf of clients and work through ethical dilemmas encountered by transactional attorneys.

Requisites: Requires a prerequisite course of LAWS 7051 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 7079 (2) Wrongful Convictions

Focuses on the issues and remedies in cases of people who have been convicted, whose traditional appellate remedies have been exhausted, and who continue to claim actual innocence. Preference given to those who have taken or are taking more criminal procedure courses.

Grading Basis: Letter Grade

LAWS 7085 (2) Law and Religion

Uses judicial decisions as well as historical and theoretical materials to explore significant aspects of the relationship between law and religion. The religion clauses of the First Amendment are a central but not exclusive subject of study. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 7095 (2) Women in Law

Explores the role of women in the legal system by looking at women as parties, jurors, witnesses, lawyers, law professors, and judges. Explores the relationship of law and society to women as victims and offenders. Investigates law and society's response to adoption, lesbian/gay issues, rape, surrogate and bad mothers, and sexual harassment.

Grading Basis: Letter Grade

LAWS 7100 (2-3) International Criminal Law: Theory and Practice

Exposes students to the rapidly growing body of jurisprudence, both international and national, wherein international humanitarian and human rights law are being applied for the purposes of prosecution, trial and punishment of individuals alleged to be responsible for the commission of war crimes, crimes against humanity, genocide and, more recently, terrorism.

Requisites: Requires prerequisite course of LAWS 6400 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7101 (4) Deals: Engineering Financial Transactions

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7102 (2-3) Oil and Gas

Deals with the legal problems associated with private arrangements for the ownership and development of oil and gas: deeds and leases to oil and gas rights, trespass, adverse possession, implied covenants in leases, conveyances of fractional interests, and the interaction of private rights and conservation regulation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7103 (2-3) Ethics and Compliance Capstone

Integrates skills and knowledge from the introductory compliance course and other courses in law school compliance curriculum as students develop a compliance program for an institution.

Requisites: Requires prerequisite course of LAWS 6112 (minimum grade D).

Grading Basis: Letter Grade

LAWS 7105 (3) Family Law

Focuses on nature of marriage, actions for annulment and divorce, problems of alimony and property division, separation agreements, and custody of children. Also considers illegitimacy, abortion, contraception, the status of married women in common law and under modern statutes and relations of parent and child.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7106 (1-2) Moot Court Competition

Offers an intensive involvement in legal research, appellate brief writing and oral arguments in a competitive context. Student finalists may continue involvement in regional and national competitions.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7111 (3) Contract Theory: Collisions of Contracting and Culture

Explores various contract theories and principles emanating from classical and neoclassical law, legal realism, law and economics, critical legal studies, law and society, relational theory, and others. Considers and critiques these theories as applied to particular contracting cultures, especially as applied to construction contracts.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7115 (3) Juvenile Justice

Covers a wide array of issues dealing with the legal rights of the unborn, children and juveniles. Covers the legal status of parent-child abuse, delinquency and crime, and emancipation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7116 (1) Barristers Council

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

LAWS 7121 (3) Advanced Contracts: Commercial Transactions

Studies Article 2 and Article 2A of the Uniform Commercial Code, together with the Convention and the International Sale of Goods. Advanced contracts topics are explored in depth. Among other subjects, warranties, title, remedies and risk of loss in the sale of lease of goods will be studied.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7122 (2-3) Mining and Mineral Development Law

Addresses major issues affecting the development of mineral resources through mining activity. Includes the regulation of the impacts of mining on the environment on both public and private land. Covers the Mining Law of 1872, the Federal Coal Leasing Amendments and state regulation of the impacts of mining on the environment.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7125 (2) Advanced Domestic Relations

Offers advanced study of several domestic relations subjects, including both theoretical and lawyering issues. Tentative subjects include discovery, client interviewing and deposition preparation, asset valuation, working with expert witnesses, children as clients, and alternative dispute resolution.

Recommended: Prerequisite LAWS 7105.

Grading Basis: Letter Grade

LAWS 7126 (1-2) Transactional Competition

Covers a broad array of topics, including, but far from limited to, contract negotiation, health law, mergers and acquisitions, and client counseling. A valuable opportunity for students to gain experience outside the classroom and develop tactics for interacting with clients, negotiation, techniques, and transactional drafting skills. Provides great opportunities for networking. A division of Barristers' Council.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7128 (2-4) Jurisprudence

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 8128

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 7132 (3) Energy, Insecurity, Sustainable Law

Examines why national security deals not only with armed aggression and the ability to thwart military invasions or subversion, but also includes critical threats to vital national and international support systems such as the economy, energy and the environment.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7135 (3) Parent, Child, and State

Examines the legal rights of parents and children in a constitutional framework, as well as the state's authority to define and regulate the parent-child relationship. Addresses rights of parents and children to freedom of expression and religious exercise, termination of parental rights and adoption, paternity orientation and culture in defining the family.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7138 (3) Legal Philosophy

Grading Basis: Letter Grade

LAWS 7145 (3) Comparative Family Law

Examines and critiques law, legal institutions and traditions of the country of focus and the US as they affect children, families, and work. Enhances research and writing skills, including field and international research. Contributes to host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7154 (3) Land Use Planning

Explores mechanisms for public control of private land uses, such as planning, zoning, and regulation of land development; including consideration of federal and state constitutional and statutory limitations on local governments. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 7159 (2) Advanced Trial Advocacy

Offers an advanced course covering trial practice elements. Open only to students who have taken LAWS 6109.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7164 (2) Land Conservation Law

Focuses on private land conservation efforts in the United States, and particularly Colorado, also considers public land conservation programs. Analyzes real property principles and instruments used to protect land, and the development and acceptance of conservation easements in gross as a mechanism for protection, financing mechanisms for land conservation, including direct government funding and indirect funding through tax incentives at the federal, state and local levels. Understanding of Real Property and Tax concepts helpful.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 7169 (2) Motions Advocacy

Provides practical training in preparing and arguing pretrial, post-trial and chambers motions to an experienced federal judge based on materials from actual case files. Assigns some research papers. Limited to 15 third-year students with interest in trial advocacy and willingness to participate in confrontational exercises. Counts as practice hours.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7200 (3) Anthropology of Law

Reviews the relationship between the social and cultural features of both developed and developing country societies and the formal and informal legal institutions within them. Considers the nature of social control and constraint, judicial reasoning, fact finding, conciliation, mediation and arbitration, and legal discourse.

Grading Basis: Letter Grade

LAWS 7201 (3) Antitrust

Studies American competition policy: collaborations among competitors, including agreements on price and boycotts, definition of agreement, monopolization, vertical restraints such as resale price maintenance and territorial confinement of dealers. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7202 (3) Environmental Law

Examines and analyzes important federal pollution control statutes, including the National Environmental Policy Act, the Clean Air Act and Clean Water Act, Solid Waste Act, and Superfund. Considers related economic theory, ethics and policy issues.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7205 (3) Administrative Law

Covers practices and procedures of administrative agencies and limitations thereon, including the Federal Administrative Procedure Act, and the relationship between courts and agencies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7207 (3) Federal Estate and Gift Tax

Analyzes federal estate and gift taxation of inter vivos and testamentary transfers, introduces income taxation of estates and trusts and involves elementary estate planning.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6710

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7209 (4) Natural Resources and Environmental Law Clinic

Offers hands-on experience in the practice of natural resources law in the Rocky Mountain region to a select number of clinic students. The clinic's docket of active cases focuses on public land law and the environmental statutes protecting those lands and their resources. Students participate in projects that test the full range of lawyering skills, including traditional litigation, administrative advocacy, legislative drafting, and the conduct of complex negotiations and settlements.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7211 (3) Business Planning

Focuses on the development and use of concepts derived from a number of legal areas in the context of business planning and counseling.

Topics such as formation of business entities, sale of a business, recapitalization, division, reorganization and dissolution are considered.

Requisites: Requires prerequisite courses of LAWS 6007 and LAWS 6201 and LAWS 6251 or LAWS 6211 (all minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7212 (2) Environmental Litigation

Examines the litigation strategies and procedures used to enforce and defend against enforcement under environmental protection statutes, such as the Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, and the Toxic Substances Control Act. Covers civil enforcement, and citizen's suits.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7217 (2) Estate Planning

Discusses problems and solutions for owners of various-sized estates and different types of assets including jointly-held property, stock in closely-held corporations and farms, analysis of federal taxation of generation-skipping transfers in trust, postmortem estate planning and drafting of trusts and wills.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6720

Requisites: Requires prerequisite course of LAWS 7207 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7218 (2-3) Legal History

Grading Basis: Letter Grade

LAWS 7221 (2-3) Government Regulation of Business

Covers themes that explore the nature of the regulatory state and the realities of how businesses react to regulation. Provides an understanding of regulatory institutions; the tools of governmental regulation; a critical perspective on regulation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7222 (2-3) Environmental Decision-Making

Explores the foundational issues that underlie agency decision-making, including environmental ethics, cost-benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

Equivalent - Duplicate Degree Credit Not Granted: ENV5 6222

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7228 (2) Intellectual Origins of the Constitution

Examines the views of the Constitution's framers as expressed in contemporaneous and antecedent writings and debates. Offered in alternate years.

Grading Basis: Letter Grade

LAWS 7232 (3) Global Energy Justice

Establishes why nearly a third of the world populated by the energy oppressed poor, presents a major national and international "legislative" or socio political problem calling for answers from governments and civil societies in the developed and developing world. Explains and elucidates the concept of energy justice, its jurisprudential heritage and its meaning and relevance in contemporary society. Case studies present problem solving frameworks spanning the political, social, behavioral, engineering, natural sciences and law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7241 (3) Telecommunications Law and Policy

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5240

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7248 (3) History of Criminal Justice

Explores the social, cultural, and legal history of Anglo-American criminal justice from the 17th to the 20th centuries. Also examines tensions between various methods that historians employ to study crime and law.

Grading Basis: Letter Grade

LAWS 7251 (3) Non-Profit Law

Examines the creation of a non-profit organization, in particular whether to choose a trust or a corporate form, how to qualify for federal tax exemption, and differences between private foundations and public charities. Examines fiduciary duty issues, restrictions on political activity and private benefit, and unrelated business income tax. Addresses tax incentives for charitable giving and state fundraising laws.

Grading Basis: Letter Grade

LAWS 7255 (3) Local Government

Studies state legislative and judicial control of the activities, powers and duties of local governmental units, including home-rule cities and counties, and some problems of federal, state, and local constitutional and statutory limitations on governmental powers when exercised by local governmental units (e.g., the powers to regulate private activities, tax, spend, borrow money and condemn private property for public uses). Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7261 (3) Corporate Finance

Examines a variety of important legal issues related to the funding and financing corporations including creditor protection laws, the Trust Indenture Act of 1939, fiduciary duties, bond indenture provisions, securities laws and rights of equity holders. Covers efficient capitalization structures, corporated valuation techniques, capital markets and the efficient market theory and cost of capital concept.

Requisites: Requires prerequisite course of LAWS 6211 or LAWS 6251 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7271 (3) Venture Capital and Private Equity

Provides overview of the legal and financial principles to represent privately held companies, their founders and managers and their investors. Emphasizes transaction structuring rather than judicial opinions. Includes the organization and financing of start-ups, structuring buyout transactions, exit strategies, legal organization of investment funds and other financial intermediaries. Discusses the relevant regulatory landscape, including securities law, bankruptcy, ERISA and tax law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7285 (2-3) Education and the Constitution

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers and critical thinkers and provides an opportunity to grow as colleagues and teammates.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7055.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Government and Public

LAWS 7300 (2-3) International Litigation

Examines the special issues that arise in litigation in U.S. courts when one or more of the parties is a foreign individual, corporation, or government, or when the subject of the litigation concerns events occurring wholly or partly outside of this country. Includes personal jurisdiction over foreign defendants, extraterritorial service of process and evidence gathering, choice of forum, foreign sovereign immunity, the act of state doctrine, extraterritorial application of U.S. law, and recognition of enforcement of foreign judgments.

Grading Basis: Letter Grade

LAWS 7301 (2-3) Copyright

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5265

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7302 (2) Advanced Oil and Gas

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environment regulation, and the interplay between federal, state and local regulation.

Requisites: Requires prerequisite course of LAWS 7102 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7303 (3) Complex Civil Litigation

Covers civil procedure in modern complex multiparty suits, including class actions in such settings as employment discrimination and mass torts, and problems in discovery, joinder, res judicata, collateral estoppel and judicial management in such suits. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7307 (3) Taxation of Natural Resources

Considers the federal income tax aspects applicable to the exploration for, the development of, and the operation of natural resources, as well as the financing thereof. Also considers oil and gas, hard minerals, timber, and water. Offered in alternate years.

Recommended: Prerequisite LAWS 6007.

Grading Basis: Letter Grade

LAWS 7309 (2-4) American Indian Law Clinic

Offers a clinical education course involving participation in the representation and advocacy of Indian causes – land or water claims, Indian religious freedom, job or other discrimination based on race and issues implicating tribal sovereignty.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7310 (3) International Dispute Settlement

Examines various mechanisms for the settlement of international disputes. Includes negotiation, inquiry, mediation, conciliation, arbitration, and adjudication. Focuses on intergovernmental dispute resolution.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7311 (2-3) Patent Law

Covers selected topics, such as patentable subject matter, patentability and utilization of patent rights through licensing and infringement litigation. Covers practice and procedure of the patent and trademark office.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7312 (2) Advanced Water Law

Builds on the study of basic water law principles for those interested in practicing in this field. Explores in more detail the highly developed legal and administrative system of water law in Colorado and other states, including the use of special courts to adjudicate the existence of water rights and approve changes of use.

Requisites: Requires prerequisite course of LAWS 6302 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7315 (3) Criminal Justice Policy and Practice

Focuses on policy and practice issues rather than case law. Examines how American criminal justice is (and has been) dispensed in the vast majority of cases that never reach trial. Devotes attention to systemic issues rather than case-specific problems. Studies policy behavior, prosecutorial charging and bargaining discretion, the provision of defense services, bail and preventive detention, plea negotiation, and sentencing— aspects of the criminal process that affect huge volumes of cases and require thought in global terms.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Criminal

LAWS 7318 (3) Economics of the American Legal System

Explores the economics of the American legal system. Topics include the cost of producing lawyers, the market for legal services, the practical challenges of running small and large law firms and the government's role in making legal services available.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7320 (3) International Criminal Law

Surveys international human rights law and international crime and punishment. Addresses idea of rights from a historical, philosophical, conceptual and analytical perspective; explores the "Primary rules of conduct" as well as adjudication and remedies, and selected rights from a comparative perspective.

Recommended: Prerequisite LAWS 6400.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7321 (1-2) Patent Drafting and Prosecution

Covers transactions, and often high-tech deals involving intellectual property rights. Studies IP ownership; assignment or rights; commercialization transactions (licensing, distribution, strategic); antitrust; emerging issues. Gives students essential tools to draft and analyze technology contracts.

Requisites: Requires prerequisite course of LAWS 6301 or 7301 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7322 (1) Field Trip of Upper Colorado River Basin for Advanced Water

Spend a week out in the basin meeting and talking with key leaders directly involved in Colorado River Basin water matters, visiting major water projects such as storage facilities and observing their operations, visiting major water users such as irrigation districts and cities, visiting and talking with tribal leaders and touring projects aimed at recovering populations of endangered fish.

Requisites: Requires corequisite course of LAWS 7312.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7323 (2-3) Patent Litigation

Focuses on unique aspects of patent litigation: substantive patent law, civil procedure, federal jurisdiction and litigation strategy; includes claim construction, infringement, anticipation and obviousness defenses, unenforceability challenges, declaratory judgments, injunctions, damages, settlements, licenses and trial strategy. Of interest and useful to those interested in intellectual property generally, not just patents or in litigation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7325 (3) Election Law

Examines the rapidly evolving field of election law: the right to vote, voting procedures, redistricting, candidate selection, campaign finance laws and direct democracy. Emphasizes federal law, including applicable constitutional jurisprudence.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7331 (2) Sports Law

Covers the application of rules from agency, antitrust, contracts, constitutional law (including sex discrimination), labor law, property, torts, unincorporated associations and other subjects to those persons involved in the production and delivery of athletic competition to consumers. Explores the development of the application of these rules to a sports setting and related economic issues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7333 (2) Advanced Evidence: Forensic Science and the Criminal Courts

Explores the admissibility of forensic science opinion and expert testimony, its use as evidence at a trial, and the challenges that such evidence may pose for the courts and the entire criminal justice system in the future.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7335 (1) The Law of Presidential Elections

Examines the laws and regulations that uniquely shape presidential selection, analyzing practical applications as well as the broader constitutional and policy considerations. A combination of federal, state, and local laws shapes how Americans select their president. But more than ever before, Americans are questioning the rules that influence presidential selection, such as the major party primary system, ballot access, presidential campaign financing, and the electoral college.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public Law

LAWS 7341 (3) Trademark and Unfair Competition Law

Examines trademark protection, the interaction of trademark and unfair competition law with other intellectual property doctrines, the requirements for acquiring and retaining federal trademark rights, false advertising and other misrepresentations, the right of publicity and related claims, remedies for infringement, and international aspects of trademark protection.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7345 (2) Comparative Criminal Procedure

Takes an in-depth look at some of the basic features of modern criminal justice systems that share the civil law tradition with the hope that such study will provide a vehicle for a deeper understanding of the strengths and weaknesses of the American system of criminal justice.

Requisites: Requires prerequisite course of LAWS 6045 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 7350 (2-3) Analytical Strategies

Develops analytical, writing and problem-solving skills necessary to pass the bar exam and succeed in practice. Designed for third-year law students in their final semester. Students will improve their techniques for analyzing, organizing and writing responses to essay and performance test questions through frequent written exercises and individual feedback on those exercises.

Grading Basis: Letter Grade

LAWS 7361 (2) Cybersecurity

Introduces students to the laws that regulate the basic technologies of the Internet and the management of information in the digital age. It examines the most significant statutes, regulations, and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7365 (2) Comp Constitutional Law

Grading Basis: Letter Grade

LAWS 7371 (3) Standardization and Standards Wars

Examines current issues in the standardization of telecommunications and information technologies. Covers the importance of standards, government and private sector perspectives and the impact of information age technologies on standards of development. Emphasizes key national and international organizations.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7375 (3) U.S. Races and Justice Systems

Examines the unique but related legal, social, and economic problems and accomplishments of those persons in this country whose ancestry originated in Africa, Asia, Latin America, or North America, and explores the developing literature on whites and whiteness.

Grading Basis: Letter Grade

LAWS 7381 (3) Intellectual Property Counseling and Licensing

Introduces strategic development and procurement of IP, including patents, trademarks, copyrights, and trade secrets. Evaluates the latest cases and legal trends from a practical and strategic perspective. Focuses on widely accepted best practices and critical thinking in these areas.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property, Technology Telecomm

LAWS 7401 (3) Securities Regulation

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7402 (2) The Law of Toxic and Hazardous Wastes

Examines the EPA's federal hazardous waste statutes, including the Resource Conservation and Recovery Act of 1976 (RCRA), and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Analyzes the RCRA "Cradle-to-grave" hazardous waste program and addresses the evolving CERCLA liability scheme and cleanup process.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7405 (2-3) Health Law 2: Medical Malpractice and Quality Regulation

Explores (1) the law controlling ethical issues that arise during the delivery of medical care, (2) the substantive law of medical malpractice and tort reform aimed at reducing the frequency and severity of medical malpractice verdicts, and (3) the practical aspects of litigating a medical malpractice case. Cross-listed at the Health Sciences Center; will include field trips there.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7406 (1) International Moot Court Competition

Open only to students who actively participate in the seminar preparing for the competition, in the preparation of memorials for the competition, and in the practice of oral arguments or regional oral arguments.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7407 (1-3) Tax Policy

Explores current issues in tax policy. Topics may include the tax legislative process, consumption taxes, taxes and distributive justice, the tax exemption for nonprofits, carbon taxes, corporate taxes and integration, and taxes and entrepreneurship. There are no required prerequisites, but Federal Income Tax will be helpful.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7409 (3) Legal Negotiation

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7411 (2-3) Mergers, Acquisitions and Reorganizations

Studies the planning of corporate mergers, acquisitions and reorganizations, examining the application and integration of state corporate law, federal securities law, accounting principles, tax law, labor law, products liability law, environmental law, ERISA and antitrust law.

Equivalent - Duplicate Degree Credit Not Granted: BADM 6900

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7415 (2) Bioethics and Law

Grading Basis: Letter Grade

LAWS 7420 (2) European Union Law

Covers all the essential aspects of the EU law: EU institutions, competences, the making and the application of EU law, and the content of the fundamental principles of EU law and the common market.

Grading Basis: Letter Grade

LAWS 7425 (2-3) Health Law and Policy: Access, Cost, Quality, Choice

Acquaints students with the issues arising at the interface between law and medicine through analysis of cases and other materials. Critically analyzes methods used by courts and legislatures to address medical/legal problems in an effort to determine whether the legal resolution was reasonable and appropriate in light of medical, social and political considerations. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7426 (2) Health Care Compliance

Introduces students to a number of primary laws and regulations that give rise to the vast majority of serious fraud and abuse cases. The primary statutes and regulations implementing them will then be viewed from the context of common problems in the health care industry such as: up-coding, unbundling, worthless services/quality of care, medically unnecessary care, over-utilization, joint ventures with referral physicians, off-label marketing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7428 (3) Bioethics Law and Literature

Interdisciplinary study of law, medicine, and bioethics. Addresses such issues as confidentiality in medical treatment, rejecting life-sustaining treatment, death and dying, reproductive law and genetic technology, human experimentation, and access to health care.

Grading Basis: Letter Grade

LAWS 7429 (2) Alternative Dispute Resolution

Examines a variety of dispute resolution processes, such as mediation, arbitration, minitrials and court-annexed settlement procedures, as alternatives to traditional court adjudication.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7431 (3) Corporate Finance

Grading Basis: Letter Grade

LAWS 7433 (3) Remedies

Examines the types of relief available to vindicate various rights. Covers damages, specific performance, injunctions, and restitution. Emphasizes the planning aspect of enforcement, in view of the limitations and problems of proof associated with specific remedies.

Grading Basis: Letter Grade

LAWS 7439 (2-3) Mediation

Explores mediation, one of the more important methods of alternative dispute resolution and the legal issues that may arise related to mediation. Considers what kinds of persons and disputes are most appropriate for mediation. Includes role playing.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7440 (3) International Human Rights and Humanitarian Law

Surveys international human rights both in law and in philosophy, both current and historical.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7445 (2) Insurance Law

Grading Basis: Letter Grade

LAWS 7449 (2-4) Juvenile and Family Law Clinic

Examines the world of child welfare from the view of the child client, by representing their best interests in abuse and neglect cases. As Guardians ad litem, students will represent children in abuse and neglect cases from the beginning, at the temporary shelter hearing, through the conclusion of the case at a permanency orders hearing.

Repeatable: Repeatable for up to 8.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7451 (3) Law and Finance for Entrepreneurs

Studies unique legal problems faced by entrepreneurs, including formation issues (choice of entity, rights of the founders, initial investors), operation issues (governance, key employees, intellectual property, financing), IPOs and buy-outs.

Equivalent - Duplicate Degree Credit Not Granted: BADM 6910

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7458 (2) Law and Literature

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka, and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal, and a final eight page paper are required.

Grading Basis: Letter Grade

LAWS 7461 (1) Dispute Resolution in the Digital Age

Explores the need for expanded and equalized access to remedies in consumer cases, and how the internet opens doors to online dispute resolution ("ODR") systems that utilize cost-effective negotiation, mediation, and arbitration processes for resolving complaints. This course will look at the various systems currently used by major companies, as well as the rules and treaty developments in global markets.

Grading Basis: Letter Grade

LAWS 7465 (2) Public Health Law and Ethics

Explores the legal and ethical dimension of public health. Focuses on topics that generate legal and ethical controversies, including governmental duties to protect citizens, nature and the extent of the government's ability to regulate conduct and responses to epidemics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7475 (2) Advanced Torts

Studies selected tort actions and theories. Topics covered may include "Dignitary torts" (e.g., defamation, privacy, etc.), business torts, and product liability. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7505 (2) Sexuality and the Law

Examines the regulation of sexuality in local, state, and federal law, with particular emphasis on sexual orientation. Explores how sexuality shapes, and is shaped by, an array of laws and policies, which may include family law, military regulations, tax law, employment law, trusts and estates, obscenity law, and criminal law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7507 (2-3) State and Local Taxation

Examines the operation of the income, property and sales tax used to finance our state and local governments. Includes requirements of equal protection and due process. Covers jurisdiction to tax allocation of the tax base among different state and local governments.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6760

Grading Basis: Letter Grade

LAWS 7509 (1) Mock Trial Competition

Student teams further develop trial and advocacy skills in a competitive mock-trial format involving two or more rounds of trials. Requires preparation of trial briefs and drafting other court pleadings and documents. Credit is limited to the top two teams (six students). Student finalists may continue involvement in regional and national competitions.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7512 (2) Advanced Environmental Law: Air Pollution

Provides an examination of efforts to regulate air pollution in the United States under the Clean Air Act. Covers key provisions, basic approach of cooperative federalism, role of science and risk assessment establishing health-based standards, implications of instrument choice and regulatory design on innovation and economic growth, development of 'first generation' climate policies, and new approaches to compliance and enforcement.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7513 (3) Domestic Violence

Explores the law, policy, history and theory of domestic violence. Examines the limits of legal methods and remedies for holding batterers accountable and keeping victims safe; the dynamics of abusive relationships; the history of the criminal justice system's response to domestic violence; the defenses available to battered persons who kill their abusers; the legal paradigm of the sympathetic victim; psychological and feminist theories about abusive relationships; civil rights and tort liability for batterers and third parties; and the intersection of domestic violence with international human rights.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7515 (3) Poverty Law

Explores the legal and policy responses to poverty in the United States and addresses how the law shapes the lives of poor people and communities. Examines the extent of poverty in the United States, the root causes and the historical development of social welfare policy. Focuses on the rights-based aspect of poverty law and various policies that attempt to ameliorate poverty.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7520 (3) Food Law and Practice

Surveys the basic regulatory landscape of food law with insight into critical legal issues facing industry and consumers. Covers federal, state and municipal regulation, litigation, government incentives, international standards and soft-law. Combines doctrinal approaches with simulation and problem solving to introduce systems-level thinking. No prerequisites or prior knowledge if required, though interest in food law and corporate law are helpful.

Grading Basis: Letter Grade

LAWS 7523 (2) Juvenile Law

Takes a critical look at the juvenile justice system and how it responds to the needs of juveniles who are either delinquents and/or victims of abuse. Issues include the rights and responsibility of parents, parental responsibility programs, delinquents, and the future of our juvenile courts.

Grading Basis: Letter Grade

LAWS 7525 (3) Race and American Law

Examines the judiciary's approach to racial discrimination from America's colonial period to the present day. Concludes with an analysis of the contemporary status of racial subordination in the legal system and considers recent scholarly critiques of the law's limitations in effecting racial justice. Employs an interdisciplinary approach and covers the experiences of American Indians, African Americans, Asian Pacific Americans and Chicana/os.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7529 (1) Appellate Advocacy Competition

Gives students the opportunity to participate in an intermural appellate advocacy competition, in which a brief must be filed and reviewed, critiqued, and deemed credit-worthy by a member of the faculty. (Law School Rule 3-2-9 (b) should be consulted prior to enrollment.)

Grading Basis: Pass/Fail

LAWS 7535 (2) Poverty, Health and Law 1

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, health, violence, and immigrants. Students will also help with intake of clinic patients and support client representation by the attorney of record.

Grading Basis: Letter Grade

LAWS 7541 (2-3) Employment Discrimination

Examines statutory and constitutional prohibitions of discrimination in employment on the basis of race, gender, age, religion, national origin and disability.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7545 (2) Poverty, Health and Law Practicum

A service learning course in which students draw from the substantive materials studied in LAWS 7535 to develop competency in case planning, problem solving, cooperative decision making, and client counseling. Students will staff cases under the supervision of a CO Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS.

Requisites: Requires prerequisite course of LAWS 7535 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7551 (2) Trade Secrets

Examines law of trade secrets and how companies and entrepreneurs use this field to protect intellectual property in conjunction with other forms of legal protection (e.g., patent, copyright and trademark).

Grading Basis: Letter Grade

LAWS 7555 (4) Poverty, Health, and Law Practicum

Introduces students to the substantive areas of health and poverty law. Topics include health disparities and the role of law, cultural competence, standards of care for vulnerable populations, relationships between income, employment, housing, education, and health. Students will also staff cases under the supervision of a Colorado Legal Services (CLS) staff attorney or a pro bono attorney working on behalf of CLS, and will develop competency in case planning, problem solving, cooperative decision making, and client counseling.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7565 (3) Corporate Transactions in Health Law

Introduces key corporate and regulatory issues impacting the delivery of health care. Focus will be transactional, with students gaining an understanding of basic corporate law and regulatory principles, and then learning to integrate core federal and state laws into choice and use of corporate structures and operational strategies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7601 (2-3) Business Transactions

Provides a practical understanding of how to apply the law in both transactional and litigation settings. Gives an interdisciplinary look at how various areas of the law are brought together in common factual settings. Teaches students to negotiate, document and close the acquisition of a business covering the areas of practice of corporate, contracts, real property, secured transactions and bankruptcy law. Tests, in a litigation setting, the decisions made during the acquisition stage.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 7605 (2) Refugee and Asylum Law

Focuses on protections offered under international and domestic law for persons who are threatened by persecution or other adverse conditions in their country of origin. Covers who is a refugee and the protections they have or do not have under United States and international law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7609 (1-2) Law Practice Management

Studies the establishment of a solo or small-firm legal practice. Topics include the business structure (PC, LLC, etc.), office systems, marketing and development, staffing, liability insurance, managing time, technology and billing. (This practice course counts toward the 14 credit hour maximum of practice hours.) Course supported by the Section of Law Practice Management of the ABA in memory of Harold A. Feder, CU Law '59.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7611 (2-3) International Business Transactions

Examines the sources of international business law, the relationship between such law and the U.S. legal system, the choice of law in international business disputes, the special issues that arise when doing business with foreign governments, the law governing international sales and the shipment of goods and international intellectual property protection. Offered in alternate years.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7615 (4) Immigration Law and Immigrants' Rights

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7181

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7617 (3) International Taxation

Covers basic aspects of the United States taxation of income earned abroad by its citizens and the taxation of income derived by foreign persons from U.S. sources, including the implications of income tax treaties.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6780

Requisites: Requires prerequisite course of LAWS 6007 or 6157 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 7618 (1) Marijuana Law and Policy

Covers three distinct but interwoven topics: substantive law governing marijuana; policy rationales behind and outcomes produced by different approaches to regulating the drug; and the legal authority to regulate the drug. The objective is to prepare to handle legal issues that arise in practice but also to provide informed counsel on proposed an future reforms to the law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 7619 (3) Entrepreneurial Law Clinic

Provides law students with practical experience in transactional law while offering valuable legal services without charge to local startup businesses lacking access to legal resources. Enrollment priority is given to third year law students. The ELC professor may set forth additional requirements to ensure that students are qualified to provide services to ELC clients.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7629 (1) Introduction to the In-House Practice of Law

Explores cutting edge questions around the practice of law as an employee of a business. Demonstrates how the combination of law and business can be valuable to businesses and also innovative, challenging and rewarding to legal professionals. Legal services to corporate America is changing dramatically with more entities relying on in-house counsel, compared to private practitioners, to obtain legal advice and counsel.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7709 (3) Advanced Legal Negotiation

Deepens students' understanding of the economic, psychological, cultural, and critical literatures related to legal negotiation and bargaining, provides students an advanced set of negotiations, experiences and simulations that introduce new dynamics and problems not dealt with in the core course, and deepens students' self-understanding and ability to learn from experience.

Requisites: Requires prerequisite course of LAWS 7409 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7715 (3) Indigenous Peoples in International Law

Studies developments in the substance and procedure of international human rights law pertaining to indigenous peoples, examining these developments through varying perspectives, doctrinal and political, pragmatic and critical. Students will become familiar with indigenous peoples' involvement in the human rights movement both before and after WWII, and corresponding developments in the United Nations, Organization of American States, and other institutions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 7718 (2) The Regulation of Marijuana

Covers three distinct but interwoven topics: substantive law governing marijuana, policy rationales behind and outcomes produced by different approaches to regulating the drug and the legal authority to regulate the drug. Prepares one to handle legal issues that arise in practice, but also to provide informed counsel on proposed and future reforms to law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 7725 (3) American Indian Law I

Investigates the federal statutory, decisional and constitutional law that bears upon American Indians, tribal governments and Indian reservation transactions.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7735 (3) American Indian Law II

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom, and tribal natural resource and environmental management.

Requisites: Requires prerequisite course of LAWS 7725 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7745 (2-3) Jurisdiction in Indian Country

Examines the current state of the justice system within Indian nations today. Includes understanding the respective roles of tribal and state law enforcement authorities, as well as the Bureau of Indian Affairs' Office of Justice Services, the Federal Bureau of Investigation, and the Drug Enforcement Administration. Examines relationship between federal and tribal courts; substantive laws; and advocates who appear before them.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 7751 (3) Arbitration

Discusses the nature of arbitration, enforcement of arbitration agreements and awards, complexities of multi-party arbitrations, fairness and efficiency of the arbitral process and other issues related to arbitration's prevalence in contexts ranging from corporate to consumer and employment disputes.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7765 (3) Gender and Justice

Grading Basis: Letter Grade

LAWS 7775 (1) Gender Law and Public Policy

Examines the relationship of law and gender in criminal law, and constitutional law, using feminist theoretical perspectives as the organizing principle. Each perspective is applied to cases and material on such topics as violence against women, prostitution, pornography, and discrimination in education and athletics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 7801 (1) Tech Policy Advocacy

Provides an intensive, one-week look at the substance, strategy, tactics, and import of technology policy advocacy. Each year, we will study one particular theme or conflict and examine it in-depth. The point of studying one particular episode is to learn lessons about the practice of technology policy advocacy that apply beyond this one historical moment. This class is meant to combine traditional doctrinal approaches with an experiential focus.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 7809 (2-4) Technology Law and Policy Clinic

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5250

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7846 (1-3) Independent Legal Research

Involves independent study and preparation of a research paper under faculty supervision. Students produce a research paper equivalent to a seminar research paper. A draft is submitted, subjected to critique by the faculty member, and redrafted. Available during or after the fifth semester of law school. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 7896 (1) Journal: University of Colorado Law Review

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the University of Colorado Law Review.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7906 (2) Journal: University of Colorado Law Review

Gives students the opportunity to participate in the research, writing, and editing activities involved in publishing the University of Colorado Law Review.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7916 (1) Journal: CO Natural Resources, Energy & Environmental Law Review

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7926 (2) Journal: CO Natural Resources, Energy & Environmental Law Review

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Colorado Journal of International Environmental Law and Policy.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7936 (1) Journal: Colorado Technology Law Journal

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 7939 (1-7) Extern Program

Extern credit may be earned for uncompensated work for a sponsor, which may be any lawyer, judge, or organization that employs lawyers or judges and is approved by the Academic and Student Affairs Committee. Work is done under the direction of a field instructor (a lawyer or judge as the sponsor) and a member of the law faculty. Requires a substantial writing component and 50 hours of working time per credit hour. a minimum of 1 and a maximum of 7 credit hours may be earned. Classified as practice credit.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 7946 (2) Journal: Colorado Technology Law Journal

Gives students the opportunity to participate in the research, writing and editing activities involved in publishing the Journal of Telecommunications and High Technology Law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 8005 (2) Seminar: Advanced Constitutional Law Equality and Privacy

Addresses "Equal Protection" rights under the Fourteenth Amendment and "Privacy" rights to personal autonomy. Analyzes varied constitutional grounds for recognizing or rejecting abortion rights; limits on Congressional power to pass civil rights laws granting broader rights than the Fourteenth Amendment does; treatment of sexual orientation-related laws and government actions as "Privacy" versus "Equality" matters; and "Benign"/"remedial" race- and sex-based government decisions such as affirmative action and same-sex schools.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8011 (1-3) Seminar: Humanizing Contracts: Service Learning

Examines contract theory and policy, while providing community-based service. Students analyze and discuss readings exploring doctrinal and theoretical bases of contract law, and see "Contracts in action" through participating in a service project. Requires a final paper linking theory and doctrine with service experiences. Note: this is a year-long seminar (2 credits per semester); students must enroll in both semesters but receive only one grade at the end of the year. Students participate in a service project that may include off-campus and weekend participation.

Grading Basis: Letter Grade

LAWS 8013 (2) Seminar: Habeas Corpus: The Great Writ of Liberty

Includes readings on the history of the writ, its constitutional status, and its use as a civil rights remedy, as well as case studies of important Supreme Court decisions, and a review of contemporary jurisdictional and procedural issues.

Grading Basis: Letter Grade

LAWS 8015 (1-3) Seminar: Constitutional Theory

Examines the role of the courts and the other branches of government in defining and enforcing constitutional values. Relevant readings are from philosophy, social sciences, and legal scholarship, as well as cases.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8021 (2-3) Consumers and the Law

Expands understanding and analysis of contracts beyond the basic concepts learned in the first-year contracts course. Explores norms, goals and functions of consumer law and also observes the law "in action" through a class blog and outreach with the Boulder County Department of Housing and Human Services ("BCDHHS"), who assists people throughout Boulder County with an array of financial, housing and other consumer issues.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8025 (2) Seminar: Advanced Topics in Federalism

Explores the development of "Our Federalism", the relationship between federal and state governments, from the founding period of the US Supreme Court's recent New Federalism jurisprudence. Studies historical material, commentary, and case law and addresses how federalism is defined; the values that federalism serves; the role of federalism in our interconnected, global society; the Supreme Court's boundaries of federalism; the direction of New Federalism.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8035 (2) Seminar: Intersection of Antidiscrimination and First Amendment Law

Addresses past and continuing debates involving potential tensions between antidiscrimination principles and free speech, free exercise and establishment clause values. Examines constitutional protections under the First Amendment and the equal protection clause, together with an array of existing and proposed federal and state antidiscrimination laws regulating employment, housing, and public accommodations, among other areas.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8036 (2-3) Special Topics in Intellectual Property

Applies copyright doctrine to the digital music contexts. Topics may include but are not limited to radio, compulsory licensing, performance rights, sampling, user generated content, term extension, termination rights, "open-access" and the public domain, emerging technologies and infringement, social implications of copyright legislation, digital fair use and the first sale doctrine and moral rights for users and artists.

Requisites: Require a prerequisite course of LAWS 6301 or LAWS 7301 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 8045 (2) Seminar: Comparative Constitutional Law

Examines legal structures and concepts typically found in constitutions, including judicial review, distinction between legislative and executive authority, federalism and the principle of subsidiarity, the relationship between church and state, free speech and press, and social welfare rights. Examines differences between constitutional law and other domestic law, role of comparative constitutional law in domestic constitutional law adjudication. Emphasizes American and Swedish perspectives.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8055 (1-2) Seminar: Media, Popular Culture, and the Law

Examines how the institutions, practices and the very identity of law are in part affected by the media through which law is apprehended and communicated. Hence the general question posed in this seminar: to what extent and how are the forms and methods of the new media having an effect on the perception, role and identity of law? This is a year-long seminar.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8060 (3) Poverty and Inequality in Comparative Perspective

Investigates the nature, causes, consequences and major responses to persistent poverty and inequality in the United States and several other countries. Students are expected to write short response papers for each assignment as well as a substantial research paper on a topic selected in discussion with the instructor.

Grading Basis: Letter Grade

LAWS 8065 (2) Sem White Collar Crime

Grading Basis: Letter Grade

LAWS 8075 (2) Seminar: Race, Racism, and American Law

Focuses on issues of race reform law, in particular the group of issues dealing with Black Americans. (Students of all hues and persuasions are welcome.) Offers an interpretive or critical dimension, rather than a litigation-oriented one. Helps students understand how race reform law works and how attitudes and historical forces have shaped that body of law.

Grading Basis: Letter Grade

LAWS 8085 (2) Sem Crit Race Theory

Grading Basis: Letter Grade

LAWS 8095 (2) Seminar: Problems in Constitutional Law

Explores how theories of social freedom and self-governance developed in the United States. Analyzes the most controversial socio-legal issues as they relate to privacy, equal protection and other questions of substantive due process. Discusses recent trends in national security and information privacy to evaluate their overall relevance to civil liberties and nascent influence on the fundamental rights debate in the US and abroad.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8101 (3) Business Law Colloquium

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8103 (2) Seminar: Alternative Dispute Resolution Ethics

Explores the ethics of mediators and other alternative dispute resolvers and facilitators, of attorneys representing clients in alternative dispute resolution processes, and of judges serving in alternative roles. Issues include confidentiality, providing appropriate notice to those concerned, and avoidance of conflicts of interest.

Grading Basis: Letter Grade

LAWS 8104 (2) Seminar: Cities, Suburbs, and the Law

Explores dynamics that play out in the relationship between cities, suburbs, exurbs and other patterns of urban development. Explores the nature of local power, relations between local jurisdictions, and metropolitan and regional approaches to governance. Includes fiscal disparities, ethnic and racial segregation, sprawl and growth controls, affordable housing, transportation, and the urban/rural divide.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 8105 (3) Seminar: Comparative Family Law

Examines and critiques law, legal institutions and traditions of the country of focus and the U.S. as they affect children, families and work. Enhances research and writing skills, including field and international research. Contributes to the host country through scholarship and service. Increases cultural competence through active engagement with peers and with social justice issues in another country. Includes required field study component and service learning project over spring break.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8110 (2) Fascism and the Liberal State

Explores fascist legal theory and its critiques of the liberal democratic state. Readings of major conservative, liberal, fascist, Nazi and Marxist theorists including Marx, Gentile, Fuller, Neumann, Schmitt, Agamben, Hayek and Mill. Understand from a variety of perspectives, the structure and character of the liberal democratic state, its strengths and weaknesses as well as its susceptibility of fascism.

Grading Basis: Letter Grade

LAWS 8111 (3) Sem: National Security Law and US Foreign Policy

Explores the legal frameworks influencing the development of national security policy and U.S. foreign policy. Students will be introduced to applicable U.S. Foreign Relations Law, U.S. National Security Law and International Law before considering how such apply and interact in response to current threats to national security.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8112 (2-3) Seminar: Advanced Natural Resources Law

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary, and scientific materials. Includes field-trip, and requires additional field trip expenses. Department enforced prerequisites or corequisites: any two of the following: LAWS 6002 or LAWS 6112 or LAWS 6302 or LAWS 7725.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite LAWS 6112.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8115 (2) Seminar: Child Abuse and the Law

Explores legal responses to child abuse by examining the constitutional framework for legal proceedings, effective strategies for preventing child abuse and punishing offenders, alternatives to the current system, and cultural aspects of child abuse and the legal response to it. Examines physical abuse and neglect, and focuses on sexual abuse.

Grading Basis: Letter Grade

LAWS 8120 (2-3) Special Topics in Constitutional Law

Offers students the opportunity for in-depth discussion and study on an important topic of constitutional law. Topics may vary from year to year.

Grading Basis: Letter Grade

LAWS 8122 (2) Seminar: Mineral Development

Deals with legal and policy issues surrounding mineral development and its environmental impacts. Emphasizes the problems associated with hard rock minerals and coal development, with some treatment of oil and gas leasing and development issues. Focuses on western public lands with some discussion of international and private lands issues.

Grading Basis: Letter Grade

LAWS 8125 (2) Seminar: Law and the Politics of Family Law

Examines issues that have been raised under the United States Constitution with respect to state regulation of families. Topics include questions of family and individual privacy, the status of children, procreation, marriage and divorce, the definition of family relationships, and problems of federalism and the role of the Supreme Court in the regulation of families.

Grading Basis: Letter Grade

LAWS 8128 (2-3) Jurisprudence

Addresses a number of fundamental questions, such as: What is law? What should it be? How is it created? Our readings consist of cutting-edge articles from leading modernist/postmodernist schools of thought including legal formalism, legal realism, interpretive theory, law and economics, feminist jurisprudence, critical legal studies and law and literature.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7128

Grading Basis: Letter Grade

Additional Information: Departmental Category: Legal Theory, Jurisprudence Social Policy

LAWS 8135 (2) Seminar: Gender, Work, and Family

Explores the social and legal problems that develop at the intersection of work and family, and considers legal/non-legal solutions that have been and could be used to accommodate both women and men in their efforts to deal with these problems.

Grading Basis: Letter Grade

LAWS 8138 (2) Seminar: The Rhetoric of Law

Considers how Anglo-American law operates rhetorically, how it persuades, builds character, offers proof, approximates the truth, establishes legitimacy, and makes things happen. It will also explore the ethics of rhetoric and note the relationship of rhetoric to other bodies of legal scholarship (e.g., law and literature, legal pragmatism, law and culture). It will hone student advocacy skills, prepare students to anticipate and defend against the rhetorical stratagems of different legal actors, and enrich students' sense of professional identity.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

LAWS 8154 (2) Seminar: Land Use Planning

Discusses public control of private land uses through planning, zoning, and regulation of land development, including consideration of constitutional and statutory limitations on legislatively created techniques. Offered in alternate years.

Grading Basis: Letter Grade

LAWS 8202 (2) Seminar: Environmental Policy

Examines issues of environmental justice, including the disparate impacts of pollution and land use controls on certain communities and ethnic groups. Topics may include concentration of waste facilities in neighborhoods occupied by poor and minority populations, adequate protection of migrant farmworkers from the impacts of pesticide hazards, and environmental controls that inhibit economic growth and development sought by Indian tribes.

Grading Basis: Letter Grade

LAWS 8205 (3) Seminar: Law and Democratic Governance

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7171

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7325.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8210 (2) Seminar: Comparative Law

Studies discrete topics in Jewish law such as family law, commercial law, criminal law, etc., using the text *Jewish Law: Cases and Materials*, and other sources such as guest lectures. The collection of books that we received from the Touro Law Center will provide a valuable resource for student research.

Grading Basis: Letter Grade

LAWS 8211 (2) Sem: Comp Constitutional Law: US, UK and Australia

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Grading Basis: Letter Grade

LAWS 8212 (2) Seminar: Environmental Law Practice and Policy

Focuses on the translation of environmental policies and purposes into environmental law and practice. Investigates policy issues on prevention of significant deterioration of air quality (PSD), the particulate matter national ambient air quality standard (PM NAAQS), and global climate changes. Emphasizes legal structure issues, including the role of national, state, and local governments in implementing environmental law and policy as well as counterpart global structures and mechanisms for responding to global or transboundary environmental problems.

Requisites: Requires prerequisite course of LAWS 7202 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 8222 (2) Seminar: Environmental Philosophy and Law

Investigates the changing philosophical underpinnings of U.S. environmental law and policy and how philosophy and legal institutions interact.

Grading Basis: Letter Grade

LAWS 8235 (2) Family Law Topics

Explores a variety of current issues related to family law: topics will change to reflect emerging issues and will draw from legal and social science scholarship as well as relevant statutes and cases. Possible topics include reproductive technology, children's rights, the role of religion in family law, and political theories of the family.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8251 (2) Seminar: Advanced Corporate Law

Explores current issues in corporate and securities law, including developments in fiduciary duties of officers and directors, corporate governance, executive compensation, revisions to the model business corporation act, and state and federal litigation reform.

Grading Basis: Letter Grade

LAWS 8285 (2-3) Seminar: Education and the Constitution

Teaches the substantive constitutional law governing public education. Students will teach constitutional materials to high school students in the local Denver Metro area high schools. Interested students must apply and requires a commitment to a full-year curriculum. Encourages individual development as teachers, writers, and critical thinkers, and provides an opportunity to grow as colleagues and teammates. Requires extra time outside of class.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7055.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8300 (3) Seminar: International Adjudication

Focuses on writing briefs and memoranda of law suitable for practice before tribunals such as the International Courts of Justice. Emphasis will be on students writing, legal analysis, and presentation of oral arguments. Instruction identifies how to research and analyze international materials, such as treaties, covenants, and international customary law.

Grading Basis: Letter Grade

LAWS 8301 (2) Seminar: Innovation, Network Theory, Social Entrepreneurship

Covers topics related to the legal and public policy implications of innovation, entrepreneurship, and social networks including normative ideals of entrepreneurship, the concept of regional advantage, whether startups should be subsidized and the design of such subsidies, the role of universities in commercializing ideas, impact of the tax code on entrepreneurship, the role of corporate responsibility in startups, and more.

Grading Basis: Letter Grade

LAWS 8302 (2) Seminar: Advanced Problems in Water Resources Law

Explores the use of watersheds as geographic and political entities for addressing water-related issues and how laws and institutions facilitate or impede watershed-based problem solving.

Grading Basis: Letter Grade

LAWS 8303 (2) Seminar: Advanced Oil and Gas

Covers the history of oil and gas conservation and its regulation, proration and allowable regulation, compulsory pooling and unitization, permitting and environmental regulation, and the interplay between federal, state and local regulation.

Requisites: Requires prerequisite course of LAWS 7102 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8310 (2) Seminar: International Crimes Punishment

Addresses issues in international criminal law in three parts: 1) basic contents of international law, 2) international criminal tribunals that enforce international criminal law, 3) national efforts to bring international criminal prosecutions.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisites LAWS 6400 and LAWS 7440.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8311 (2) Seminar: Computer Crimes

Explores legal issues that judges, legislators, prosecutors, and defense attorneys confront with the recent explosion in computer related crime. Includes Fourth Amendment in cyberspace, law of electronic surveillance, computer hacking and other computer crimes, encryption, online economic espionage, cyberterrorism, First Amendment in cyberspace, federal and state relations in enforcement of computer crime laws, and civil liberties online.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 8315 (2) Seminar: Advanced Criminal Justice

Studies policy and practice issues rather than case law. Focuses primarily on how American criminal justice is dispensed in cases that do not reach trial, including police behavior, prosecutorial discretion, defense services, bail, plea bargaining, and sentencing.

Grading Basis: Letter Grade

LAWS 8318 (2) Seminar: Law and Economics

Introduces the uses and limitations of microeconomic theory for understanding and resolving legal problems. Emphasizes concepts prominent in the law and economics literature such as cost, transaction costs, utility, and rational self interest.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8320 (2-3) Seminar: Oil and International Relations

Addresses the extent to which the international community of nations is oil dependent. Assesses the impact and the geopolitical dangers to international relations arising from the expanding demand for scarce oil from developing, as well as developed, economies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8321 (2) Seminar: Computers and Law

Explores a range of topics surrounding the juxtaposition of computers and law. Most are aware of the impact that law has on computers through the myriad of regulations that govern computers and related technologies. Less well known is the impact that computer technology is having on governance and on the practice of law. Explores both sides of this dynamic interplay between law impacting computing, and computing impacting law.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 8322 (3) Environmental Decision Making

Explores the foundational issues that underlie agency decision making, including environmental ethics, cost benefit analysis, risk assessment, constitutional law and administrative law. Compares and contrasts National Environmental Policy Act and the National Historic Preservation Act and the Endangered Species Act.

Grading Basis: Letter Grade

LAWS 8325 (2) Seminar: Reforming Criminal Trials

Starts from the premise that reform of our criminal trial system to make it less complicated, less expensive, and more reliable should be considered. Examines trial systems in other countries and U.S. changes over recent decades. Student papers make and defend proposals for reform.

Grading Basis: Letter Grade

LAWS 8335 (2) Seminar: Advanced Criminal Procedure

Focuses on a particular topic in criminal procedure. Topics include the privilege against self-incrimination, juries and defense and prosecution ethics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 8341 (3) Seminar: Law and Economics of the Information Age

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "unbundling" policies to advance competition and how intellectual property and antitrust rules should be developed.

Equivalent - Duplicate Degree Credit Not Granted: TLEN 5260

Requisites: Requires prerequisite course of LAWS 7201 or LAWS 7241 or LAWS 7301 (minimum grade D-).

Grading Basis: Letter Grade

LAWS 8345 (2) Sem Comp Crim Pro

Grading Basis: Letter Grade

LAWS 8351 (2) Seminar: Law and Economics of Utility Regulation

Discusses economics of regulation and matters ranging from neoclassical economic analysis to public choice theory to new institutional economics. Discusses several regulatory domains, including antitrust law, telecommunications regulation and energy regulation. Highlights both economic and non-economic goals, including universal service, sustainability (e.g., renewable energy) and architecture (e.g., free speech concerns with regard to telecommunications networks).

Requisites: Requires prerequisite course of LAWS 6301 or 7201 or 7241 (minimum grade D-). Restricted to Law (LAWS) or Telecommunications (TELE) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8355 (2) Seminar: Sentencing Law and Policy

Studies sentencing law against the backdrop of criminal justice policy and concerns of public policy. Covers theories of punishment, the merits of indeterminate sentencing, sentencing guidelines, and nonincarcerative sanctions. Confronts problems of race, class, and other disparities in criminal sentencing.

Grading Basis: Letter Grade

LAWS 8361 (2) Seminar: Information Privacy

Explores the laws that regulate the basic technologies of the Internet and the management of information in the digital age. Examines the most significant statutes, regulations and common law principles that comprise this emerging legal framework, including the Federal Wiretap Act, the HIPAA Privacy Rule, and the Digital Millennium Copyright Act.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Intellectual Property/Technology/Telecommunication

LAWS 8375 (2) Seminar: Advanced Immigration and Citizenship

Explores the law and policy of citizenship in the United States, starting with legal questions regarding acquisition and loss of citizenship as well as the consequences of citizenship, but also examines the fundamental premises underlying American citizenship and the concept of citizenship generally.

Grading Basis: Letter Grade

LAWS 8385 (2) Sem Law & Religion

Grading Basis: Letter Grade

LAWS 8395 (2) Seminar: Separation of Powers

Explores the constitutional relationships among the three branches of the federal government in the sphere of domestic matters, omitting foreign affairs and war. Develops topics including executive orders, Congressional control of the executive and the courts, appointment and removal of officers, impeachment, executive privilege, use of military tribunals, and the election of 2000. A seminar paper will be required.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8400 (2) Special Topics in International Law

Provides in-depth coverage of particular issues in international law and exposes students to intellectual concepts in the field. Students write seminar length papers and develop critical thinking through writing and research.

Grading Basis: Letter Grade

LAWS 8401 (2) Seminar: Securities Litigation and Enforcement

Designed for students interested in studying topics related to securities litigation. Covers civil liability under the Securities Act of 1933, proxy fraud, class actions (with special emphasis on the Private Securities Litigation Reform Act and the Securities Litigation Uniform Standards Act), market manipulation, SEC enforcement actions, enforcement issues involving attorneys and accountants, criminal enforcement, international securities fraud and securities arbitration.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8405 (2) Seminar: Public Health Law and Ethics

Explores rules of law pertaining to the American public health care system and the ethical issues raised by the government's effort to protect the health of the American people. Held at the Anschutz Medical Campus.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8407 (2) Seminar: Tax Policy

Explores current issues in tax policy. Topics may include the tax legislative process, consumption taxes, taxes and distributive justice, the tax exemption for nonprofits, carbon taxes, corporate taxes and integration and taxes and entrepreneurship.

Requisites: Requires prerequisite course of LAWS 6007 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 8409 (2) Seminar Special Problems in Conflict Resolution and Management

Develops a comprehensive description of dispute; creates a conflict assessment of the stakeholders in and dynamics of dispute; assess obstacles to and opportunities for mediation; recommend strategy for addressing and managing the dispute.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 8412 (2) Critical Law and Economics

Explores some of the more successful and enduring critiques of Chicago Law and Economics. Starts with an introduction to economic analysis, including basic analytic tools like rational actor theory, supply and demand, efficiency notions, and cost concepts. Later classes will explore more advanced works in the area.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8415 (2) Seminar: Bioethics and Law

Focuses on legal, moral, and economic analyses of problems posed or soon to be posed by advances in biomedical technologies.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8421 (2) Seminar: Duties of the Professional Advisor

Studies ethical and legal regulation of lawyers, auditors, and investment bankers, who have been described as "Gatekeepers" to the investment markets. Considers changes in ethical and legal regulation that can be adopted to restore a sense of integrity for these professionals.

Grading Basis: Letter Grade

LAWS 8425 (2) Seminar: Advanced Torts

Explores how dignitary interests have influenced the development of and have been incorporated into law, using the common law of torts and the constitutional rights of life and liberty as a general (but not exclusive) focal point of discussion.

Grading Basis: Letter Grade

LAWS 8428 (2) Seminar: Women in Law and Literature

Considers both legal and literary depictions of women and their legal and extralegal situations. Topics may include women as mothers, women as sexual beings, women's silence, women's violence and women as criminals, women at work, and women as the "Other" in law and literature.

Grading Basis: Letter Grade

LAWS 8430 (2) Seminar: Comparative Public Health Law and Ethics

Compares public health law systems to those in other countries. Studies the goals, legal structures, and services provided, together with such issues of coercion as quarantines, monitoring, mandates and prohibitions, and forcing pharmaceutical companies to make available inexpensive generic drugs.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8440 (2) Seminar: International Human Rights

Investigates the sources of international human rights law and issues of jurisdiction to prescribe, adjudicate, and enforce norms. Students study treaties and reservations, customary law, declarations, resolutions, and the U.S. courts' and activists' use of materials. Topics include sovereignty and self-determination, culture, privacy, right to equality, language and speech rights, right to development, immigration, workers and globalization, and citizenship.

Grading Basis: Letter Grade

LAWS 8450 (2) Seminar: Law and Economic Development

Explores past and present debates over the role of the legal order in economic development. Studies the relationships among economic ideas, legal ideas and the development policies pursued at the national and international level in successive historical periods, beginning in the Seventeenth Century to the present. Focuses on the potential for an alliance of various traditions from economics, law and other disciplines to understand development.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Comparative Law

LAWS 8455 (2) Gender and Criminal Justice

Explores the intersection of gender and criminal justice in such areas as police and prosecutorial discretion, the investigation and prevention of crimes, the definition of offenses and defenses, factors contributing to criminality, criminal sentencing and the experience of punishment, and the societal ramifications of incarcerating children's caregivers.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8458 (2) Seminar: Law and Literature

Focuses on the question of what literature can teach lawyers through a variety of literary works and films. Covers traditional works by Shakespeare, Tolstoy, Camus, Kafka and Melville, as well as more contemporary works by Toni Morrison and Norman Mailer. Several short reflection papers, a journal and a final paper will be required.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 8505 (2) Sem Interdisciplinary Perspectives on Law and Social Change

Introduces legal institutions engaged in social change, from courts, to Congress, to bureaucracies and organizations. Posits tension between tasks of dispute resolution and public policy development and institutional adaptations. Considers the role of public opinion and the classics of legal formalism to more critical accounts. Considers postmodern theory and empirical legal scholarship. Presents alternatives to court-centered approaches to change, including community lawyering and organizing, law and social movements, and legislation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8508 (2) Seminar: Constitutional Foundations Core Ideas

Focuses on core ideas in U.S. constitutional law, such as means/ends analysis, institutional competence, rights definitions, and juridical techniques for limiting governmental powers. Draws from historical writings, contemporary press accounts, learned treatises, oral arguments, law review articles, and key judicial opinions such as *Mccullough v. Maryland*, *Lochner v. New York*, *Brown v. Board of Education*.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8511 (2) Seminar: Wal-Mart

Examines issues raised by Wal-Mart's size, power, and business model. Considered issues bring numerous areas of law into play, including employment and labor law, social welfare legislation, class actions, antitrust, zoning, international labor and human rights regulation, and international trade. The course will show how different areas of the law are integrated in practice.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business and Commercial Law

LAWS 8515 (2) Seminar: Forced Labor

Reviews several regimes of compulsory labor that have been central to the American experience: Black chattel slavery in the antebellum South; debt peonage, criminal surety, and related institutions of agricultural involuntary servitude; convict leasing and other forms of compulsory inmate labor; "White slavery" and prostitution; and forced labor among immigrants. Emphasizes the complicated role that the law has played, and in some respects continues to play, in both supporting and undermining such institutions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8521 (2) Seminar: Comparative Labor Law

Explores the laws and economic transformations that affect labor relations on a global scale.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8531 (2) Seminar: Labor and Employment in Transportation

Explores legal, social, and economic issues arising from labor relations in the industries transporting goods and people by road, rail, air, and water, among the most critical sectors of the economy.

Grading Basis: Letter Grade

LAWS 8533 (2) Seminar: Criminal Law in Context: Legal and Social Images of Victims and Perpetrators

Contextualizes criminal law by engaging in an in depth study of the legal and social characterizations of victims and perpetrators in U.S. law, politics and popular culture.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 8535 (2) Seminar: Class and Law

Explores issues relating social class to such areas as labor relations, law enforcement, controls on radical movements and the distribution of wealth and power. Considers problems defining social class.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8538 (2) Seminar: Modern Legal Theory Core Ideas

Explores key ideas that have shaped American law and legal thought, such as Holmes' bad man, the Coase Theorem, the "Hunch" theory of law, and others. Focuses on researching and writing many short papers.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8545 (2-3) Seminar: Food Law and Policy

Introduces students to the laws and regulations that govern our food supply. The focus is federal law provided by the U.S. Food and Drug Administration, with additional readings, videos and speakers. Topics to be covered include legal definitions for food, rules on food labeling, standards for food safety, biotechnology, international trade, organic and environmental regulation, hunger, farmer's markets and obesity.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8548 (1-2) Seminar: Theory of Punishment

Explores the various justifications that philosophers have developed to explain why we have the right to punish. Examines the historical evolution of our punishment system and focuses on the death penalty as a critical contemporary issue in the debate about the proper role of punishment in our society.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8555 (2) Seminar: Race, Education and American Law

Explores issues of equity, access and reform in American public education, particularly as it pertains to race, including desegregation, diversity, equal protection and public education, tracking and high-stakes testing, courts or the political branches, charters and vouchers.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 7525.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8565 (2-3) Citizenship

The concept of citizenship connects immigration with studies of race, international human rights, gender, criminality and many others. It has been receiving growing attention in many scholarly disciplines. Examines the notion of citizenship in recent scholarship spanning law, political science, sociology and history.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8605 (3) Seminar: Regulation and Innovation

Explores two related questions: first, what role does regulation play in encouraging (or inhibiting) innovation? Second, what kinds of innovation approaches to regulation itself are being employed or might be employed and how might these strategies improve the environment for private innovation?

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 8608 (2) Seminar: Power, Ethics, and Professionalism

Examines critically the possibility and character of ethical reasoning within the legal profession in light of its institutional structures. Explores descriptive/normative accounts of the profession's structure, "Professionalism," and individual conscience. Put simply, the seminar explores whether it is possible to be a good lawyer and ethical person.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8611 (2) US National Security and Foreign Relations in a Time of Change

Explores the legal frameworks influencing the development of national security policy and US foreign policy. Students will be introduced to applicable US Foreign Relations Law, US National Security Law and International Law and will engage in analysis about current policy approaches to emergent national security threats.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 8613 (2) Seminar: Civil Liberties Litigation

Studies issues unique to the prosecution and defense of civil liberties lawsuits. Discusses litigation strategies with reference to lawsuits currently pending in the federal courts.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public Law

LAWS 8628 (2) Seminar: Law, Power, and Politics

Draws upon various works of political theory, social theory, and jurisprudence to examine different conceptualizations of politics, power, law, and their relations.

Grading Basis: Letter Grade

LAWS 8645 (3) Law and Politics Colloquium: Race in America

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 7191

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8648 (2) Seminar: The Law of Politics

Examines the legal framework that governs the political process, including such topics as the political question doctrine, the "Right to vote," the 2000 presidential election controversy, term limits, bicameralism and presentment, campaign finance, direct democracy, and the interpretation of the legislative product (i.e., statutes).

Grading Basis: Letter Grade

LAWS 8650 (3) Conflict of Laws

Provides an umbrella for several advanced business law sections, each providing an intensive intellectual experience for law students by requiring them to connect deep concepts and knowledge from basic business courses to complex transactional environments. Students are required to solve client problems and negotiate transactions in the face of intricate and conflicting legal regimes that sprawl across doctrinal fields.

Grading Basis: Letter Grade

LAWS 8701 (2) Seminar: Counseling Families in Business

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business and conflict resolution.

Recommended: Prerequisites LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 8705 (2) Seminar: Affordable Housing

Explores the policy, legal and practical dynamics that drive the development and preservation of privately owned, government subsidized affordable housing. Investigates the nature of the market for housing, with particular emphasis on multifamily rental housing and debates about market failure in that context and then outline and contrast the major regulatory responses to such market failure. Explores how subsidy programs work in practice, focusing on model documents to frame sample transactions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8718 (2) Seminar: Modern Theorists and Law

Considers the work of Levi-Strauss, Steven Lukes, Pierre Bourdieu, Alfred Schutz, Anthony Giddens, Culler, David Harvey, Denis Cosgrove, Michel Foucault, and Emily Martin with respect to social control and law. Focuses on the way in which social control is exercised through the organization of space, time, and the human body. Topics include consideration of meaning, intersubjectivity in the law, social construction of time, and the body as a real and cultural artifact.

Grading Basis: Letter Grade

LAWS 8722 (2-3) Advanced Energy Law

Provides an opportunity for students to further develop their knowledge of the field and to engage in a substantial writing project. Examples of possible topics include hydraulic fracturing, regulation of air emissions from power plants, the smart grid, transmission siting and development, the ratemaking process, design and regulation of electricity markets, energy finance or comparative study of energy regulation.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8725 (2) Seminar: Advanced Topics in American Indian Law

Examines a variety of current issues related to American Indian Law. Topics will change to reflect the subjects that emerge at each time that the seminar is offered. Some examples of topics considered include legal protections for American Indian religion and culture, cultural property, Tribal law, gaming law, and Native American natural and cultural resources law. Department enforced corequisite: LAWS 7725.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 8728 (2) Seminar: Critical Theory Colloquium

Surveys critical legal theory; introduces the discipline of analytical engagement with law review literature; feminist legal theory, and critical race theory. Offers a deeper understanding of the purposes behind legal reforms, the interaction between law on the books and law in action, how different groups experience the law in different ways and difficult yet rewarding nature of working through seemingly intractable and emotionally charged race, sex and class issues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Jurisprudence and Perspective

LAWS 8755 (2) Seminar: Higher Education and the Law

Examines the goals, governance, norms, and ideals of American institutions of higher education, and how those policies are shaped by the legal system. Examines the legal relationship between institutions of higher education and its various constituents: faculty, presidents, governing boards, students, alumni, and staff. Spans several traditional doctrinal categories, including contract, torts, employment law, constitutional law, intellectual property, tax, and antitrust.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Government and Public

LAWS 8765 (2) Seminar: Gender, Law, and Public Policy

Introduces students to various schools of feminist theory and examines the relationship between feminist theories and concrete problems in such areas as constitutional law, education law, employment discrimination, family law and criminal law.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Family, Gender, and Health

LAWS 8775 (2) Seminar: Advanced Topics in Health Law and Policy

Addresses advanced legal issues in representing physicians, long-term care institutions, hospitals, and other health providers. Issues range from economic policy, distributive justice, and bioethical questions to antitrust and regulatory issues. To be taught at Health Sciences Center.

Recommended: Prerequisite LAWS 7425.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Health Law

LAWS 8785 (2-3) Access to Justice

Explores the scholarship that has developed around the provision of legal services - or the lack of legal services - for those who cannot afford market prices for attorneys. The seminar will also examine recent efforts to provide empirical support for the range of political claims that are made about access to the legal system.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 8808 (2) Rhetoric and the Art of Persuasion

Explores recent work in rhetoric to identify the principles and techniques of effective persuasion in law. Examines the ways in which cognition, language, imagery, metaphor, narrative, and scene setting shape the ways in which lawyers and judges strive to persuade each other.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Litigation and Procedure

LAWS 9002 (3) Public Land Law

Deals with the legal status and management of resources on federal lands, including national forests, parks and BLM lands. Explores federal law, policy, and agency practice affecting the use of mineral, timber, range, water, wildlife and wilderness resources on public lands.

Requisites: Requires prerequisite course of LAWS 6112 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9003 (3) Ethical Organizations and Professionals

Provides students, particularly those in the Master of Studies in Law (MSL) in Ethics and Compliance program, the opportunity to examine what drives ethical behavior within organizations and the role that ethics and compliance professionals play in promoting ethical behavior. Investigates ethical challenges and decision making, methods to assess ethical organizational culture and qualities of ethical leadership.

Grading Basis: Letter Grade

LAWS 9005 (3) Introduction to US Law

Provides an overview of the US legal system and will help MSL students begin to 'think like lawyers'. Students will be provided with the necessary vocabulary and skills to use legal resources and legal reasoning in academic and professional environments, including reading and analyzing cases, statutes and regulations, doing legal research, and applying existing law to the issue at hand to predict answers to legal questions.

Requisites: Restricted to Master of Studies in Law (LAWS-MSL) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Electives

LAWS 9061 (1) Contract Drafting

Begins with value creation by transactional lawyers, and emphasizes the opportunity for lawyers to reduce information and agency costs, and mitigate strategic behavior by using tools such as disclosure, representation and warranties, incentive compensation and earnouts. Shifts to negotiation and drafting, focusing on basic drafting principles and strategies to advance one's clients' interests. Introduces the basic framework of contracts (recitals, reps and warranties, capitalized terms, definitions, indemnifications and escrow).

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9101 (4) Deals: Engineering Financial Transactions

Explores the business lawyer's role in creating value by helping clients identify, assess and manage business risks through efficient contract design while achieving the optimal legal, tax or regulatory treatment for the deal. Includes case studies of actual transactions.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9103 (1) Ethics of Patent Practice

Patent agents are not licensed to practice law in any state and therefore courts, clients and practitioners are often faced with uncertainty in defining the ethical obligations of a patent agent and the consequences of failure to fulfill those obligations.

Grading Basis: Letter Grade

LAWS 9104 (3) Wills and Trusts

Covers intestate succession; family protection; execution of wills; revocation and revival; will contracts and will substitutes; creation of trusts; modification and termination; charitable trusts; fiduciary administration, including probate and contest of wills; construction problems in estate distribution.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Property

LAWS 9111 (4) Business Law Colloquium

Business law scholars from CU and around the country present research papers at this weekly colloquium. Topics may include contracts, corporate law, securities regulation, tax, intellectual property, venture capital and private equity and the legal profession. No prior knowledge of law and economics is expected, although some knowledge of business organizations will be useful.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9112 (2-3) Advanced Natural Resources Law

Provides in-depth study and analysis of current problems in natural resources law, using historical, literary and scientific materials. Includes field-trip and requires additional field trip expenses.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to Law (LAWS) students only.

Recommended: Prerequisite LAWS 6112 or students must have taken or be currently enrolled in any three of the following, LAWS 6002, LAWS 6112, LAWS 6302 or LAWS 7725.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9167 (3) Partnership Taxation

Studies federal income taxation of pass-through entities such as are used by most small businesses in the U.S. Includes creation, operation, distributions, sales of interests and liquidation.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Taxation

LAWS 9209 (4) Natural Resources Law Clinic

Engages in litigation and advocacy aimed at protecting the natural resources of the Rocky Mountain region. Students will represent clients in matters involving public lands, wildlife, and other resources. The seminar component will focus on practical aspects of environmental litigation, including administrative practice and decision-making, client representation, citizen suits and ethnical issues.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 9226 (1-3) Communications for Compliance Professionals

Develops the tools students will need to thrive in the law school's MSL program. Deepens students' understanding of the United States legal system and develops their ability to communicate effectively and appropriately in writing and orally to their intended audience, and research, organize and explain their ideas clearly, using appropriate writing conventions.

Requisites: Restricted to Master of Studies in Law (LAWS-MSL) students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Research and Writing

LAWS 9341 (3) Law and Economics of the Information Age

Examines basic regulatory and legal challenges of our information economy and digital age. Emphasizes the "networked" information industries, the proper role of "Unbundling" policies to advance competition, and how intellectual property and antitrust rules should be developed.

Requisites: Requires prerequisite course of LAWS 7201 or 7241 or 7301 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9401 (3) Securities Regulation

Stresses statutory interpretation of the various federal statutes regulating the issue of corporate securities and the cases and regulations that have arisen out of those statutes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9409 (3) Legal Negotiation

Explores the fundamentals of effective negotiation techniques and policies for lawyers. Students engage in mock negotiations of several legal disputes.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practice: Clinical and Simulation

LAWS 9410 (3) International Trade Law

Examines the law of the World Trade Organization and the General Agreement on Tariffs and Trade. Examines rules restraining national restrictions on trade that addresses tariff and non-tariff barriers, discrimination, regionalism, anti-dumping, countervailing duties and safeguards. Considers the relationship between trade and other regulatory areas or social values, such as environmental protection, health and safety standards, human rights, intellectual property protection.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International

LAWS 9701 (2) Counseling Families in Business

Explores the legal aspects of owning, managing and participating in a successful family business system, including corporate structure, legal issues, succession planning and estate management, internal capital markets in private enterprise, ownership issues in private businesses, how lawyers can assist with family governance, planning for and managing family philanthropy, gender issues in family business, and conflict resolution. Recommended prerequisites: LAWS 6104 and LAWS 6157 and LAWS 6211 and/or LAWS 7409

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Business

LAWS 9712 (3) Climate Change Law and Policy

Examines the science of climate change and the broader role of science in public policymaking. Reviews the changing legal landscape to abate greenhouse gas emissions, and key issues in policy design. Reviews the Supreme Court's April 2, 2007 decision in *Massachusetts v. EPA*, overturning EPA's refusal to regulate greenhouse gas pollution from motor vehicle tailpipes, and the aftermath in the courts, Executive Branch and Congress.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9722 (3) Energy Law and Regulation

Provides an introduction to energy law and regulation in the United States. Covers basic principles of rate regulation and public utilities, the division of jurisdiction between federal and state governments, and the key federal statutes and regulatory regimes governing natural gas, electricity, and nuclear power. Focuses on the basic federal frameworks for natural gas and electricity regulation, with an emphasis on understanding the messy and uneven transition to wholesale competition in these sectors and, in the electricity context, the experience with state restructuring and retail completion.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9735 (3) American Indian Law II

Investigates the legal history and current legal status of Alaska Natives and Native Hawaiians. Addresses other current topics such as tribal water rights, tribal fishing and hunting rights, tribal justice systems, religious freedom and tribal natural resource and environmental management.

Requisites: Requires prerequisite course of LAWS 7725 (minimum grade D-). Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Environment, Natural Resources and American Indian

LAWS 9846 (1-2) LLM Seminar

LLM students study academic legal writing in this 1-credit per semester yearlong course. Topics covered will include: the purpose of academic legal writing; how academic legal writing differs from other forms of legal writing; topic selection; legal research (methods and ethics); first drafts; editing; academic workshops; and publishing. In addition, guest speakers will talk to LLM students about career planning and job seeking. International LLM students will learn about the American legal system.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

LAWS 9856 (1-4) LL.M Thesis

LL.M students are required to write a thesis in order to graduate. Requires significant work of original research on a topic chosen in close consultation with advisors and other law school faculty, and assignments include due dates for topic selection, drafts, and workshop delivery. Thesis is worth two credits. In exceptional circumstances and only after pre-approval, an LL.M student may enroll for a third or fourth credit.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Law (LAWS) students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Research and Writing

Leadership Minor (LEAD)

Courses

LEAD 1000 (3) Becoming a Leader

The foundation course will prepare students to exercise leadership in business, government and community organizations. Introduces leadership skills useful in a variety of settings including community and civic activities. Helps students to improve self awareness, understand multiple theories, recognize moral courage, build analytic and critical thinking skills and adapt leadership practices to different people and contexts.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 3030

Additional Information: Departmental Category: CU Engage

LEAD 4000 (4) Leadership in Context and Emerging Challenges: A Capstone

Integrates leadership topics and experiences students pursued through the Leadership Studies Minor. Using advanced critical thinking skills, the seminar requires students to evidence their knowledge, competencies and skills related to leadership theory and practice through examining contemporary leadership challenges. Further, the seminar directs students to justify decision-making processes, demonstrating their ability to synthesize prior knowledge to effect desirable, ethical outcomes.

Requisites: Requires a prerequisite course of LEAD 1000 or LDSP 1000 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: CU Engage

Lesbn/Gay/Bisexual Stdys (LGBT)

Courses

LGBT 2000 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay, and transgender communities.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2030

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

LGBT 2707 (3) Introduction to Lesbian, Bisexual, and Gay Literature

Offers students at sophomore and junior levels an introduction to some of the forms, concerns, and genres of contemporary lesbian, bisexual, transgender and gay writing in English.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 2707

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

LGBT 3710 (3) Topics in LGBT Studies

Content varies by semester and reflects contemporary issues in the field of LGBT Studies.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

LGBT 3796 (3) Queer Theory

Surveys theoretical, critical, and historical writings in the context of lesbian, bisexual, transgender and gay literature. Examines relationships among aesthetic, cultural and political agendas, and literary and visual texts of the 20th century.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3796

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

LGBT 3930 (3) Lesbian, Gay, Bisexual, Transgender, and Queer Studies Internship

Matches selected students with supervised internships in university programs and advocacy groups, local businesses, human service or government agencies. Internships will focus on lesbian, gay, bisexual, transgender or queer issues, such as anti-violence programs, educational outreach, and civil rights initiatives.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite LGBT 2000.

LGBT 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature. May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4287 and WGST 4287

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

LGBT 4400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, this course examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 5400 and WGST 4400 and WGST 5400

Grading Basis: Letter Grade

LGBT 4840 (3) Independent Study in LGBTQ Studies

Self-directed research project in LGBTQ studies supervised by a faculty member and approved by one of the Co-Directors of the LGBT Studies Certificate Program.

Repeatable: Repeatable for up to 6.00 total credit hours.

LGBT 5400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, this course examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 4400 and WGST 4400 and WGST 5400

Grading Basis: Letter Grade

Libby Residential Acad Prgm (LIBB) Courses

LIBB 1133 (3) Exploring Art, Culture and Visual Literacy through Drawing

Teaches basic drawing skills, mechanics of two dimensional space and deconstructs the kinds of artistic images students commonly encounter in social media, street art, graffiti, advertising, comics and tattoos as a basis for understanding how complex visual language communicates profound meaning. Experiential learning activities introduce the practices of design thinking, idea production, the creative process and critical thinking.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Grading Basis: Letter Grade

LIBB 1500 (3) The Dialogue of Art and Religion

Focuses on interdisciplinary study of visual art from the three Abrahamic monotheistic traditions. Addresses aesthetic issues related to the object; the relationship between belief systems and form; and the context of the work, especially religious and social history. Objects and structures studied include Russian Orthodox icons, Celtic and Qu'ranic manuscripts and Christian churches.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Additional Information: Arts Sci Core Curr: Ideals and Values

LIBB 1600 (3) Gender and Film

Explores a wide variety of cinematic forms and styles and discusses the treatment of femininity, masculinity, sexuality, and how gender is represented as an artifact of mass culture. Although the course title privileges issues of gender, the course also includes the study of issues of race and ethnicity in film and the inherent connections between the cinematic representations of race and gender.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression Arts Sci Core Curr: Human Diversity

LIBB 1700 (3) The History of Communication from Caves to Cyberspace

Surveys the history, evolution, and nature of communication and communication technologies. Students learn about the ongoing media revolution and its broader context, considering the interdependence of communication, culture, and society. They critically examine utopian, deterministic, and pessimistic arguments about the influence of new technologies and arts. Course combines lecture, discussion, and group work in a seminar format.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Additional Information: Arts Sci Core Curr: Historical Context

LIBB 2001 (3) Pop Culture Heroes

Examines ideals and values related to heroic archetypes as reflected in and circulated by American popular culture. Focuses on the ideology that drives notions of the heroic in pop culture figures such as celebrities and athletes, and in film, TV, comics, street art and slam/performance poetry/
Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

LIBB 2013 (3) Film and the Quest for Truth

Concerns the subjectivity and relativity of truth. Focuses on how and why we pursue (or fail to pursue) the truths about ourselves and about the people and events around us, and how and why such truths are often elusive, fragmentary, and impermanent.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Additional Information: Arts Sci Core Curr: Ideals and Values

LIBB 2100 (3) Russian Revolutions: Social and Artistic

Examines revolution as seen not only in light of political and economic effects but through the lens of its major cultural concomitant: revolution in the arts. Material is drawn from 20th century Russian social and artistic revolutions which, due in part to new post-Soviet research, provide some of the most striking examples of art and revolutionary social practices.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 2221

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Contemporary Societies

LIBB 2500 (1-3) Special Topics in Libby Residential Academic Program

Introduces timely studio subjects in the visual and performing arts that cannot be offered on a regular basis. Information concerning the studio topics offered in any given semester is available prior to registration from the Libby RAP.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

LIBB 2510 (1-3) Special Topics in Libby Residential Academic Program

Introduces timely subjects in the visual and performing arts that cannot be offered on a regular basis. Information concerning the seminar topics offered in any given semester is available prior to registration from the Libby RAP.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

LIBB 2800 (3) Horror Films and American Culture

Examines American horror films in an historical context through which students learn to recognize how horror films represent our culture's "collective fears" and provides an analysis of the horror film genre. Considers the cultural contexts in which horror films are made through study of the creation and reception of these films during specific times in American history.

Requisites: Restricted to Libby Residential Academic Program (LIBY) students only.

Additional Information: Arts Sci Core Curr: United States Context

Libraries (LIBR)

Courses

LIBR 2000 (3) Research Strategies on the Electronic Campus

Critical examination and practical exploration of computer technologies, digital communication, and electronic information systems and services for new students.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

LIBR 3010 (3) Methods of Electronic Library Research

Exploration of the structure, organization, retrieval, and evaluation of electronic information sources through the formulation of search strategies useful for undergraduate research.

LIBR 3900 (1-3) Independent Library Research

In-depth library research project for upper-division students. Instructor consent required.

LIBR 4029 (1) Art History Research Methods

Learn to expertly navigate art scholarship and be prepared to do thesis-level research. An introduction to the vast array of art historical resources and their uses. Explore advanced techniques for searching both online and offline sources of art information. Master the various modes of art historical research, including finding iconographic, historical, or technical information.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4029 and ARTH 5029

LIBR 4900 (1-3) Independent Library Research

In-depth library research project for upper-division students. Instructor consent required.

Linguistics (LING)

Courses

LING 1000 (3) Language in U.S. Society

Nontechnical exploration of the ways that language is used in America. Emphasizes language as a social institution and how values and goals of both public institutions and private groups shape and are shaped by language and its use.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Arts Sci Core Curr: United States Context
MAPS Course: Social Science

LING 1010 (3) The Study of Words

Study of English words of Latin and Greek origin, focusing on etymological meaning by analysis of component parts (prefixes, bases, suffixes) and on the ways in which words have changed and developed semantically.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1010

LING 1020 (3) Languages of the World

Explores the issue of human diversity by examining how languages vary around the world. Outlines historical, geographic, and typological classifications of languages across human societies, and the criteria used by linguists for grouping them into language families. Theorizes the relationship between linguistic and cognitive diversity, and considers the impact of language death on humanity. No formal training in linguistics is required.

Additional Information: Arts Sci Core Curr: Human Diversity

LING 1500 (3) Understanding Grammar

Presents fundamentals of grammar in the Western tradition. Emphasizes making concepts and uses of grammar (as exemplified in English and closely related foreign languages) understandable to the nonspecialist.

LING 1900 (1) Service Learning Practicum: Adult Literacy

Practicum for selected students in LING 1000. Provides practical experience of the impact of illiteracy on individuals, families, and the community at large. Coregistration in service learning recitation is required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite or corequisite course of LING 1000 (prereq minimum grade C-).

Grading Basis: Pass/Fail

LING 2000 (3) Introduction to Linguistics

Introduces the study of languages as structural systems. Principles of sound patterns, word formation, meaning, and sentence structure. Gives attention to language acquisition, psycholinguistics, language families, dialects, historical change in languages, and different language types.

Additional Information: MAPS Course: Social Science

LING 2400 (3) Language, Gender and Sexuality

Familiarizes students with the effects of gender on language use; discusses popular beliefs and scholarly theories about language and communication. Provides students with tools for exploring the role of language and gender.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

LING 3005 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications, and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and PHIL 3310 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

LING 3100 (3) Language Sound Structures

Introduces the sounds of languages and their organization into phonological structures.

Recommended: Prerequisite LING 2000.

LING 3220 (3) American Indian Languages in their Social and Cultural Context

A sampling of the many indigenous languages and cultures found in America. Emphasizes the United States, but also gives attention to the languages of Canada and Latin America.

Recommended: students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Human Diversity

LING 3430 (3) Semantics

Theoretical and practical study of meaning in natural language. Considers both semantic theories and semantic phenomena from diverse languages. Does not treat techniques for improving the use of language.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Linguistics (LING) majors only.

Recommended: Prerequisite LING 2000.

LING 3545 (3) World Language Policies

Examines the economic and sociopolitical impact of choosing English vs. other languages in the U.S. Introduces the study of language policies, rights, and planning in other countries, including the worldwide use of English in social, business, and legal contexts.

LING 3630 (3) Principles and Practices in Teaching English to Speakers of Other Languages

Provides a practical overview of principles and practices in TESOL in its global context. Introduces methods and materials (texts, media, tools) and standards for teaching, learning and assessment. Includes lesson observation, planning and micro-teaching focused especially on listening, speaking and pronunciation. Assumes some background and/or interest in linguistics and language and applications to teaching English to adults/young adults.

Requisites: Requires a prerequisite or corequisite course of LING 2000 (minimum grade C).

Grading Basis: Letter Grade

LING 3800 (1-4) Special Topics in Linguistics

Intensive study of a selected area or problem in linguistics.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

LING 4050 (3) Japanese Sociolinguistics: Japanese Language and Society

Issues of Japanese sociolinguistics in areas such as speech varieties, language behaviors and attitudes, linguistic contact and change and language policy. Incorporating critical perspectives of sociolinguistics into analyses of Japanese literature and Japanese language education.

Equivalent - Duplicate Degree Credit Not Granted: JPNS 4050 and JPNS 5050

Requisites: Requires prerequisite course of JPNS 3110 (minimum grade C).

Grading Basis: Letter Grade

LING 4100 (3) Perspectives on Language

Provides extended critical examination of a few selected issues, chosen each term for their general interest and relevance, e.g., the relation between language and thought, or human language vs. animal languages, and computer languages.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite LING 2000.

LING 4220 (3) Language and Mind

Studies topics such a speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4220

Recommended: Prerequisites PSYC 1001 and LING 2000.

LING 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4225

Recommended: Prerequisites PSYC 1001 and LING 2000.

Grading Basis: Letter Grade

LING 4420 (3) Morphology and Syntax

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

Equivalent - Duplicate Degree Credit Not Granted: LING 5420

Recommended: Prerequisite LING 2000.

LING 4450 (3) Introduction to Formal Syntax

Introduces formal generative grammar, including determining constituent structure, drawing trees, writing rules, understanding the properties of the lexicon and their interaction with syntax, X-bar theory and its modifications and movement analysis.

Recommended: Prerequisite LING 4420.

LING 4560 (3) Language Development

Emphasizes acquisition of language by young children; development in later years and into adulthood is also treated. Particular attention given to roles of environment and of neurophysiological endowment in learning to communicate with words, sentences, and narratives.

Equivalent - Duplicate Degree Credit Not Granted: SLHS 4560 and PSYC 4560

Requisites: Restricted to Linguistics (LING) majors only.

Recommended: Prerequisites LING 2000 and PSYC 1001.

LING 4610 (3) English Structure for Teachers of English to Speakers of Other Languages

Description of morphological and syntactic categories and structures of English.

Equivalent - Duplicate Degree Credit Not Granted: LING 5610

Recommended: Prerequisite LING 2000.

LING 4800 (3) Language and Culture

Principles of language structure and how language and culture interrelate, how language and language use are affected by culture and how culture may be affected by use of, or contact with, particular languages.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4800

Recommended: Prerequisite LING 1000 or LING 2400 or ANTH 2100.

LING 4830 (3) Honors Thesis

Required for students who elect departmental honors. Students write an honors thesis based on independent research under the direction of a faculty member.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Arts Sciences Honors Course

LING 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

LING 4910 (3) TESOL (Teaching English to Speakers of Other Languages) Practicum

Provides the field-based component and practical experience in English language teaching for the TESOL Certificate. Work on site includes class observations and supervised teaching in community-based programs/ESL providers. Weekly meetings provide opportunities to debrief/discuss teaching practice and connect theory, methods and practice. Supports professional development, completion of a teaching resume and portfolio and the job search process.

Equivalent - Duplicate Degree Credit Not Granted: LING 5910

Requisites: Requires prerequisite courses of LING 2000 and LING 3630 (minimum grade C).

Grading Basis: Letter Grade

LING 5030 (3) Linguistic Phonetics

Introduces practical and theoretical aspects of phonetics. Provides training in recognition and production of speech sounds, and instruction on fundamentals of articulatory, acoustic, and auditory phonetics.

Requisites: Restricted to graduate students only.

LING 5200 (3) Introduction to Computational Corpus Linguistics

Covers computer methods for doing linguistics with on-line corpora.

Includes extensive introduction (with lab) to the Python programming language, UNIX corpus tools, concordance programs, syntactic treebanks, propbanks, and corpora for discourse and phonology research.

Requisites: Restricted to graduate students only.

LING 5300 (3) Research in Psycholinguistics

After a general introduction to issues and research methods in psycholinguistics (language production and comprehension, language and cognition, language acquisition), several major current research topics, such as models of speech production and theories of brain specialization for language, are explored.

Recommended: Prerequisite at least one graduate-level course in LING, PSYC or CSCI.

LING 5410 (3) Phonology

Studies sound systems of language. Introduces both principles of organization of sound systems and major kinds of phonological structures found worldwide. Provides extensive practice in applying phonological principles to data analysis.

Recommended: Prerequisite LING 5030.

LING 5420 (3) Morphology and Syntax

Introduces principles of word formation and sentence structure. Covers major morphological and syntactic structures found in the world's languages, and methods for describing grammatical structures, and includes practice in analyzing data from a variety of languages.

Equivalent - Duplicate Degree Credit Not Granted: LING 4420

Requisites: Restricted to graduate students only.

LING 5430 (3) Semantics and Pragmatics

Explores fundamental concepts of semantics and pragmatics, including theories of communication and meaning, representation, conversational implications, speech acts, and discourse structure.

Recommended: Prerequisite LING 5420.

LING 5570 (3) Introduction to Diachronic Linguistics

Familiarizes students with terminology, methods, and theories dealing with phenomena of language change through time.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5410.

LING 5610 (3) English Structure for Teachers of English to Speakers of Other Languages

Description of morphological and syntactic categories and structures of English.

Equivalent - Duplicate Degree Credit Not Granted: LING 4610

Requisites: Restricted to graduate students only.

LING 5620 (3) Teaching ESL Pronunciation

Examines the phonetics and phonology of American English (including prosody) and explores techniques for teaching pronunciation skills to non-native speakers. Treats both general issues and specific problems for students from particular language backgrounds.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 3100 or LING 5030 and LING 5410.

LING 5630 (3) Methods and Materials for Teaching English as an Additional Language

Provides an overview of methods and materials for teaching English as an additional language, along with opportunities for students to observe, discuss and analyze these in relation to language teaching principles, linguistic considerations, and global and local contexts. Aimed primarily at the teaching of English to nonnative speaking adults, the course also addresses second and foreign language teaching generally.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5610 or LING 5620.

LING 5800 (3) Open Topics in Linguistics

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

LING 5832 (3) Natural Language Processing

Explores the field of natural language processing as it is concerned with the theoretical and practical issues that arise in getting computers to perform useful and interesting tasks with natural language. Covers the problems of understanding complex language phenomena and building practical programs.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 5832

Requisites: Restricted to graduate students only.

LING 5900 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

LING 5910 (1-3) TESOL Practicum

Provides observation and supervised teaching experiences in classroom and other contexts involving the teaching of English to speakers of other languages, especially adults and young adult learners in settings outside K-12. Meetings provide opportunities to debrief and to consult on teaching practice; help students connect theory, methods and practice; and support a professional teaching portfolio process.

Equivalent - Duplicate Degree Credit Not Granted: LING 4910

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 4610 or LING 5610.

LING 6200 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and PHIL 6310 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Recommended: Prerequisite at least one course at the 3000-level or higher in CSCI, LING, PHIL, or PSYC.

LING 6300 (3) Topics in Language Use

Discusses current issues and research in a selected area related to language use and function. Sample topics include conversational interaction, language policy, language content, and sociolinguistic variation.

Requisites: Restricted to graduate students only.

LING 6310 (3) Sociolinguistic Analysis

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary sociolinguistic analysis, with special emphasis on linguistic variation, diversity and change.

Requisites: Restricted to graduate students only.

LING 6320 (3) Linguistic Anthropology

Serves as an advanced introduction to the empirical and theoretical foundations of contemporary linguistic anthropology, with special emphasis on the ways in which culture and society emerge semiotically through language and discourse.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 6320

Requisites: Restricted to graduate students only.

LING 6450 (3) Syntactic Analysis

Introduces the major constructs used by formal theories of syntax to capture the relationship between meaning and syntactic form and uses data from diverse languages to explore the universality of these constructs.

Requisites: Restricted to graduate students only.

LING 6500 (3) Issues in Indigenous Languages

Addresses socio-cultural issues concerning indigenous languages, including human rights, intellectual property, language endangerment and maintenance, identity, linguistic relativity, sense of place.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 6500

Grading Basis: Letter Grade

LING 6510 (3) Language Structures

Surveys the structure of one or more languages, emphasizing understanding how parts of the language interact. Designed to supplement courses in which parts of languages are used to illustrate theoretical claims.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites LING 5410 and LING 5420.

LING 6520 (3) Topics in Comparative Linguistics

Students compare and contrast selected structures of languages treated from a typological, genetic, or a real perspective. No special prior knowledge of the subject language is required.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites LING 5410 and LING 5420 and LING 5570.

LING 6560 (3) Language Acquisition

Theories and research methods in first-language acquisition of phonology, morphology, syntax, semantics, and pragmatics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites LING 5410 and LING 5420 and LING 5430.

LING 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

LING 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

LING 7030 (3) Phonetic Theory and Analysis

Provides students with the practical skills and the conceptual framework to do independent research in phonetics (or in other areas relying on phonetic data). Introduces current and traditional issues in phonetic research (both experimental and theoretical) and gives training in analytical methods.

Recommended: Prerequisites LING 5030 and LING 5410.

LING 7100 (3) Field Methods 1

Introduces the process of discovering structure of a language from data obtained directly from its speakers. Emphasizes effectiveness in the field context, rapid recognition of structural features, and preliminary formulation using computational tools.

Recommended: Prerequisites LING 5410 and LING 5420.

LING 7320 (3) Narrative and Identity

Examines the ways in which identities are constructed, contested, and negotiated through narrative practice.

LING 7350 (3) Language and Gender in Cultural Perspective

Examines organizations of language and gender in a variety of societies and cultures from the perspectives of sociolinguistics, linguistic anthropology, and socially-oriented discourse analysis.

LING 7360 (3) Language and Sexuality

Explores the role of language in the social construction and articulation of sexuality.

LING 7410 (3) Phonological Theory

Phonetic and morphophonological representations: distinctive features, segments, prosodic structures, morphological structures. Phonological processes and their interaction. Naturalness conditions.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5410.

LING 7415 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project. Department enforced prerequisites: CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and EDUC 6506 and PHIL 7415 and PSYC 7415 and SLHS 7418

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

LING 7420 (3) Syntactic Theory

Covers various topics in syntactic theory.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 5420.

LING 7425 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and PHIL 7425 and PSYC 7425 and SLHS 7428

Requisites: Restricted to graduate students only.

Recommended: Prerequisite LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506.

LING 7430 (3) Semantic Theory

Current developments in the theory of linguistic semantics. Topics include truth-conditional theories, generative linguistic theories, semantic theories of communicative competence and integration of these theories in development of a combined theory of semantics and pragmatics.

Recommended: Prerequisite LING 5430.

LING 7570 (3) Advanced Diachronic Linguistics

Presents theories of language change. Discusses mechanisms of language change, its trajectories over linguistic categories and items and its relation to theories of grammar and of language variation.

Recommended: Prerequisites LING 5410 and LING 5420 and LING 5570.

LING 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and PHIL 7810 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

LING 7800 (3) Open Topics in Linguistics

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors. Contact the department office for information.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

LING 7900 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

LING 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Management (MGMT)

Courses

MGMT 1000 (1) The Dean's Leadership Forum

The Dean's Leadership Forum is a one-hour, invitation-only seminar course aimed at developing young, promising leaders and is part of the School's commitment to Educating Principled, Innovative Leaders Who Drive Value. Focuses on various aspects of real-world leadership and introduces students to CEOs and successful business leaders of all types, with a heavy emphasis on CU alumni.

Requisites: Restricted to students with 0-26 units (Freshmen) Business (BUSN) majors only.

Grading Basis: Pass/Fail

MGMT 1001 (1) Women in Business

Everyone can benefit from taking the time to reflect upon and grow their leadership ability. The purpose of this experience is to ground students in a community of similarly minded, high caliber individuals, to equip them with leadership insights and best practices, and to encourage them to achieve their greatest leadership goals. This will be accomplished by careful discussion, readings, and perhaps, most importantly, exposure to key chief executive officers and other very highly accomplished leaders. Although we discuss the unique aspect of being a woman in business, men are welcomed to share in the leadership experience.

Requisites: Restricted to students with 0-26 units (Freshmen) Business (BUSN) majors only.

Grading Basis: Pass/Fail

MGMT 3010 (3) Negotiation and Conflict Management

Provides an opportunity to learn and practice the foundational skills of negotiation and conflict management. This class provides a set of conceptual tools for diagnosing problems and obtaining agreement in difficult situations. Theoretical frameworks from Game Theory get explained and mastered through class simulations. Students will learn to identify and strategically execute a set of options that allow them to obtain their business objectives while building effective and harmonious work relationships.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2300 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3025 (3) Essential Management Skills

The course takes as its starting point the fact that not all students will be leaders. A student may end up as an individual contributor, or manager of a small group of people, or an owner of a sole-proprietorship. Students can have a tremendous impact on these roles and the questions becomes, how can they become the best they can be?

Requisites: Restricted to Business (BUSNU) majors only.

MGMT 3030 (3) Critical Leadership Skills

Provides an opportunity to learn about and practice the skills required of all managers. These skills include leadership, negotiation, conducting performance appraisals, delegation, effective communication, interviewing and making hiring decisions, and managing employees with problem behaviors. Objectives include developing self-awareness of strengths and weaknesses as a manager, gaining familiarity with theory-based skills, and developing proficiency in the use of these skills.

Equivalent - Duplicate Degree Credit Not Granted: LEAD 1000

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3040 (3) Fundamentals of Socially Responsible Leadership

Designed to build on the learning from MGMT 3030 and the rest of the management track curriculum, while adding more depth and breadth around the context managers operate within. Techniques used by current business leaders and seminal leadership scholars to prepare students to handle various leadership situations will be explored. Students will engage in oral and written presentations.

Equivalent - Duplicate Degree Credit Not Granted: CESR 3040

Requisites: Requires a prerequisite course of BASE 2104 and prerequisite or corequisite course of MGMT 3030 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3100 (3) Operations Management

Examines concepts, tools and techniques used in the management of service operations. Focuses on how firms add value and compete with high quality and efficient services. Emphasizes the use of models for designing new products services and improving the effectiveness of service processes. Studies the application of technology in the context of productivity, growth and the globalization of manufacturing and services.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3200 (3) Business Analytics

Teaches cutting-edge tools and approaches to the analysis of data, including "big data" for effective decision-making. The class creates data connoisseurs through hands-on exposure to exploratory and predictive analytics. Application areas covered include Web Marketing, the Internet of Things, Biometric Monitoring, as well as data integration and analysis for online marketing, human resources and operations.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3201 (3) Business Analytics

Teaches cutting-edge tools and approaches to the analysis of data, including "big data" for effective decision-making. Creates data connoisseurs through hands-on exposure to exploratory and predictive analytics. Application areas covered include Web Marketing, the Internet of Things, Biometric Monitoring, as well as data integration and analysis for online marketing, human resources and operations.

Equivalent - Duplicate Degree Credit Not Granted: MKTG 3201

Requisites: Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3210 (3) Business Application Programming

The objective is to introduce students to the world of programming and empower them with the ability to create and extend business applications. Students will learn the core concepts of programming with VBA (Visual Basic for Applications) and use them to customize and extend applications like Excel, as well as a method to decompose a complex task into manageable pieces.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 3220 (3) Introduction to Python Programming

Python has emerged as the key programming language for data science and business analytics. Helps students understand the programming mindset through use of open source software and libraries and introduces students to object oriented programming.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed

MGMT 3800 (3) Consulting Skills

Provides students with skills to understand, diagnose and solve problems that businesses face. Strong focus on action learning, so emphasizes case analyses, project based learning and exposure to models used in the consulting world. Features interactions with consultants from some of the top firms in the world, such as McKinsey.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4010 (3) Redefining the Employee-Employer Relationship

Explores developments in such areas as employee relations law and procedures, employee and employer rights, worker involvement programs, environmental safety and health, and the effects of technology on emerging organization forms.

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2300 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4020 (3) Hiring and Retaining Critical Human Resources

Allows students the opportunity to practice conducting job analyses and then use this information to develop employee selection and performance appraisal systems. Provides thorough coverage of employers' equal employment opportunity and affirmative action obligations, as well as various approaches to gender, cultural, and ethnic diversity.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2300 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4030 (3) Managing Employee Reward Systems

Examines theories of work motivation and relates them to the strategic use of compensation and other reward systems. Topics include procedures for managing base pay; linking pay incentives to productivity at the individual, group, and organizational levels; developing cost-effective programs of employee benefits; and the use of nonfinancial reward systems.

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2300 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4040 (3) Individual, Team, and Organizational Development

Explores how to determine where an organization needs to focus its development efforts, how to develop and deliver an effective training program, and how to evaluate the impact of development programs on organizational effectiveness. Explores individual, team, and organization-wide development, including such topics as skills training, team building, and managing change.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2300 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4065 (3) Digital Leadership

In the digital age, leaders have to orchestrate radical redesign of everything from their internal processes to their business model on an ongoing basis. This requires leaders to adopt new approaches to leadership and new behaviors. This course provides students with the skills required in identifying business opportunities, finding appropriate information related technologies and leading innovation efforts to success.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4090 (3) IT and Business Strategy

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. Combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoption efforts to success.

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2300 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4110 (3) Supply Chain Management

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses, and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4120 (3) Managing Business Processes

Covers the concepts and tools to design and manage business processes. Emphasizes modeling an analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 5120

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4130 (3) Sustainable Operations

Sustainable operations examines business strategies in response to environmental and social challenges. Grounded in resource efficiency, life-cycle thinking and a dose of investigative skepticism, the course assists students to thoroughly understand the scope of costs, benefits and risks associated with driving businesses toward sustainable operations.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4130

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4140 (3) Project Management

Introduces multidisciplinary project management concepts, skills, and tools, including the relationship between project definition, organization, planning, scheduling, resource and risk management, control, costing and performance. Presents both qualitative and quantitative tools for better project management.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2300 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4150 (3) International Operations Management

Compares systems of production/operations management in the United States with those in Japan, Europe and Asia. Contrasts various regional and national approaches to business, quality management, labor practices, management styles, international competitiveness, productivity, distribution systems, trade practices and strategies for penetrating foreign markets. Examines different sociocultural environments, government-business relationships, banking industries, operations strategies and the potential for transferring industrial management practices and techniques between countries.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4200 (3) Competitive Strategy

Provides students with the foundational skills related to competitive strategy. Tools and techniques associated with this course will enable students to understand the fundamentals of why one firm outperforms another through understanding the fundamentals of superior performance at the business unit level. Examples of specific learning objectives: develop an understanding of fundamentals of what is strategy, foundations of competitive advantage.

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2500 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4205 (3) Business Data Management

Emphasizes the fundamentals of modern database design in the context of large-scale applications. Covers analysis phase activities such as data modeling for requirements analysis. Covers the extended entity relationship model and the semantic data model in-depth. Covers design phase activities such as the normalization criteria of the relational model and transformation from conceptual to physical design. Introduces object oriented databases.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4210 (3) Systems Thinking

Provides students with problem solving and critical thinking skills in order to analyze large, complex social problems. Students learn techniques to get to the root cause of the problem and understand unintended consequences of proposed solutions to that problem. Students learn to break from typical mental models, make paradigm shifts and learn to recognize and avoid learning barriers and biases.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2300 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4220 (3) Business Technologies

Covers ERP (enterprise resource planning) technologies which facilitate business processes within firms in three modules. The first will involve understanding the basics of technologies in organization. The second module will introduce OpenERP, an open-source ERP system for small-medium sized businesses. The final module is an introduction to SAP, the most widely used ERP system for large organizations.

Requisites: Requires prerequisite course of BASE 2104 or BCOR 2300 or BCOR 2500 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4230 (3) Design of Usable Business Systems

Focuses on the development of user-friendly business systems, especially websites. Students will plan, design and develop websites, including mobile sites, that are user-friendly and visually appealing following current best practices for responsive and interactive design. Usability testing and website analytics techniques will be explored and practiced.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 5230

Requisites: Requires prerequisite courses of BASE 2101 and BASE 2102 and BASE 2103 and BASE 2104 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4240 (3) Competitive Strategy

Covers the competitive strategy of firms. Topics include: what is strategy, external analysis and Porter's five forces, internal analysis and the resource based view, value added and strategic positioning, innovation and entrepreneurship, market entry timing, competitive dynamics.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors.

MGMT 4250 (3) Information Security Management

A broad introduction to the managerial issues of information security. Because security is multifaceted, the topics of the class range widely, including technical (e.g., cryptography), managerial (e.g., policy compliance), physical (e.g., door locks) and psychological (e.g., social engineering) issues. A key objective is to develop a security mindset, in which one learns to think like an attacker for ways to exploit a system.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4430 (3) Corporate Boards in Action

Allows students from any functional area of business to appreciate the difficulties modern boards and management face. Issues addressed include financial strategy; board composition; executive succession, tenure and compensation; management through crisis; sustainability and corporate social responsibility; the challenges and opportunities presented by globalization and international governance issues.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4430

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4440 (3) Privacy in Big Data Analytics

Privacy = the new currency. In a time where technology allows unprecedented aggregation of personal information use of "private" information is moving faster than social norms and laws can follow. We will dissect the technologies and social trends related primarily to privacy and use of information about individuals to reap profits. A good complement to business intelligence and analytics classes.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4440

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4500 (3) Enterprise Intelligence Systems

Through case studies and assignments, students learn how to evaluate and design Enterprise Intelligence Systems (EIS). Students evaluate and develop EIS data governance plans to promote data quality, improve information assurance and better manage risk. Using advanced tools and programming languages, students evaluate, design and prototype strategies, processes and procedures to support the collection, transformation and loading of enterprise data into usable data repositories known as data warehouses and data marts.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4820 (3) Topics in Business

Experimental course offered irregularly for purpose presenting new subject matter in organization management.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 5820

MGMT 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Management.

Requisites: Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4828 (3) Experimental Seminar: Corporate Boards in Action

Explores the complexity of corporate boards and the need for values-driven leadership. Students will consider corporate governance topics including: financial strategy, international challenges, ethics, corporate social responsibility, board composition, compensation and crisis management. Throughout the course, students will evaluate their own leadership and decision making abilities as they work together in student-run boards to address issues presented in a variety of case studies.

Equivalent - Duplicate Degree Credit Not Granted: CESR 4828

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MGMT 4850 (3) Senior Seminar in Management

Covers the issues and challenges of running a firm in a competitive environment. It integrates and builds upon coursework in other functional areas. Discusses principles, frameworks, and techniques that helps understand how to analyze the competitive environment; firm sources of competitive advantage; competitive dynamics; and, specific types of strategies to promote firm performance. Focuses on specific company examples. Formerly MGMT 4000.

Requisites: Requires prerequisite courses of BCOR 2300 and BCOR 2500 or BASE 2104 (all minimum grade D-). Restricted to students with 102-180 units completed.

MGMT 4900 (1-3) Independent Study

Intended only for exceptionally well qualified business seniors. Departmental form required. Instructor consent required.

MGMT 4910 (1-3) Academic Internship in Management

Offers students the opportunity to gain professional work experience in a management position while still in school. Provides academically relevant work experience that complements students' studies and enhances their career potential. Includes 100 hours per credit and a course paper. Instructor consent is required. Pass/Fail grading only. Formerly SYST 4910, OPIM 4910.

Requisites: Requires prerequisite course of BCOR 2500 (minimum grade D-). Restricted to students with 52-180 units completed.

Grading Basis: Pass/Fail

MGMT 5120 (3) Managing Business Processes

Covers the concepts and tools to design and manage business processes. Emphasizes modeling an analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4120

Requisites: Restricted to graduate students only.

MGMT 5230 (3) Design of Usable Business Systems

Focuses on the development of user-friendly business systems, especially websites. Students will plan, design and develop websites, including mobile sites, that are user-friendly and visually appealing following current best practices for responsive and interactive design. Usability testing and website analytics techniques will be explored and practiced.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4230

Requisites: Restricted to graduate students only.

MGMT 5820 (3) Topics in Business

Experimental course offered irregularly for purpose presenting new subject matter in organization management.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 4820

MGMT 8900 (1-3) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

MGMT 8990 (1-10) Doctoral Thesis

Work with a faculty advisor on a doctoral thesis. Student should have passed comprehensive exam before registering for doctoral thesis hours.

Requisites: Restricted to graduate students only.

Marketing (MKTG)

Courses

MKTG 2400 (3) Principles of Marketing for Communications

At its most fundamental level, marketing encompasses activities designed to facilitate exchange. These activities are often described with the "4Ps": product, place, price and promotion. Through these 4Ps, marketers create benefits that provide values to consumers. This course will address how marketers make decisions about the 4Ps to provide value to consumers and motivate consumers to engage in exchange transactions.

Requisites: Requires a prerequisite course of APRD 1002 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors), Strategic Communication (STCM) majors only.

MKTG 2700 (3) Digital Marketing Tools

Digital marketing is an exciting area of marketing practice. Designed to give the knowledge, skills and experiences for digital marketing. Topics covered include search engine optimization, social media data analysis, search ads, the advertising technology business landscape and email marketing. An important course theme is that digital efforts should be designed with performance measurement in mind.

Equivalent - Duplicate Degree Credit Not Granted: MKTG 3700

MKTG 3050 (3) Customer Analytics

Students develop a deep understanding of customer centricity and its implications for the firm, learn about state-of-the-art methods for calculating customer lifetime value and customer equity and develop the analytical and empirical skills that are needed to judge the appropriateness, performance and value of different statistical techniques that can be used to address issues around customer acquisition, development and retention.

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2400 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

Additional Information: Business Honors Course

MKTG 3100 (3) Fundamentals of Professional Selling

Explores the principles and methods of professional salesmanship with a focus on sales processes, best practices and frameworks used to organize sales efforts. Structured to include involvement from working sales professionals. Topics covered include: the role and value of professional selling in the marketing mix, ethical sales practices, sales quotas and compensation, effective sales communication, prospecting and funnel management, overcoming objections, professional sales closure and negotiation techniques.

Requisites: Requires a prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MKTG 3150 (3) Sales Management, Leadership and Organization Development

Explores factors that determine size, shape and strategies of high performing sales organizations in the context of an overall go-to-market strategy. Structure includes involvement from professional sales executives. Includes overview of fundamentals of professional selling, designing sales organization, sales objectives and metrics, sales analytics, sales force recruitment and selection, sales force training and education, sales force motivation and compensation.

Requisites: Requires prerequisite course of MKTG 3100 and BCOR 2001 or BCOR 2400 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MKTG 3201 (3) Business Analytics

Teaches cutting-edge tools and approaches to the analysis of data, including "big data" for effective decision-making. Creates data connoisseurs through hands-on exposure to exploratory and predictive analytics. Application areas covered include Web Marketing, the Internet of Things, Biometric Monitoring, as well as data integration and analysis for online marketing, human resources and operations.

Equivalent - Duplicate Degree Credit Not Granted: MGMT 3201

Requisites: Requires prerequisite course of BASE 2104 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MKTG 3250 (3) Buyer Behavior

Covers both consumer buying behavior and organizational buying behavior. Consumer behavior topics include needs and motives, personality, perception, learning, attitudes, cultural influence, and contributions of behavioral sciences that lead to understanding consumer decision making and behavior. Explores differences between business and consumer markets, business buying motives, the organizational buying center and roles, and the organizational buying process. Required for marketing majors.

Requisites: Requires prerequisite course of BCOR 2001 and BASE 2104 or BCOR 2400 (minimum grade D-). Restricted to Business (BUSN) or Advertising (ADVT) majors and 52-180 hours completed.

MKTG 3350 (3) Marketing Research and Analytics

Explores fundamental techniques of data collection and analysis used to solve marketing problems. Specific topics include problem definition, planning an investigation, developing questionnaires, sampling, tabulation, interpreting results, and preparing and presenting a final report. Required for marketing majors. .

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2400 (all minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MKTG 3700 (3) Digital Marketing

Covers the what, why and how of major digital marketing approaches, including online listening and monitoring, search engine optimization, search ads, email marketing, and social media. Designed to launch students as digital marketing professionals and to provide experience with industry-relevant hands-on assignments and exercises.

Equivalent - Duplicate Degree Credit Not Granted: MKTG 2700

Requisites: Requires prerequisite courses of BCOR 2001 and BASE 2104 or BCOR 2400 (all minimum grade D-). Restricted to Business (BUSN) majors.

MKTG 3825 (3) Experimental Seminar

Offered irregularly. Provides opportunity for investigation into new frontiers in marketing.

Requisites: Requires prerequisite course of BCOR 2400 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

MKTG 4250 (3) Product Strategy

Covers major topics in managing long-term customer relationships that derive from products. Focuses on concepts, analyses, and strategies for existing and new products. Topics include concept development and testing, conjoint analysis, product positioning, brand image measurements and brand management, and product issues in public policy and ethics. Methods of instruction include lectures, case discussions, student group papers and projects, and examinations.

Required for marketing majors.

Requisites: Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to Business (BUSN) majors with 52 minimum units required.

MKTG 4300 (3) Pricing and Channels of Distribution

Offered regularly to examine pricing and channel management, the two key components of companies' marketing strategies. Help students to understand the common types of pricing and channel strategies, the rationales behind these strategies. Train students to think analytically in order to apply these strategies. Required for marketing majors.

Requisites: Requires prerequisite courses MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to Business (BUSN) majors with minimum 52 units completed.

MKTG 4350 (3) Services Marketing Strategy

Designed for those students interested in working in the service industries. Addresses the distinct needs and problems of service organizations in the area of marketing and service quality. Service organizations (i.e., banks, transportation companies, hotels, hospitals, educational institutions, professional services, etc.) require a distinctive approach to marketing strategy—both in its development and execution. Builds and expands on marketing ideas and how to make them work in service settings.

Requisites: Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-).

MKTG 4500 (3) Advertising Management

Requisites: Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to students with 52-180 units completed.

MKTG 4550 (3) Advertising and Promotion Management

Analyzes advertising and promotion principles and practices from the marketing manager's point of view. Considers the decision to advertise, market analysis as a planning phase of the advertising program, media selection, public relations, sales promotion, promotion budgets, campaigns, evaluation of results, and agency relations.

Requisites: Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to Business (BUSN) majors with 52 minimum units required.

MKTG 4650 (3) Institutional Relationships and Strategy

Focuses on the management of a firm's relationships with other businesses. Addresses business-to-business marketing strategies, relationships with channel members, and strategic alliances/partnerships. Topics include relationship structures, power, conflict, negotiation, industry analysis, selection of business partners, and managing for long-term stability.

Requisites: Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-).

MKTG 4810 (3) Honors Seminar

Social responsibilities of the business executive, business ethics, business-government relations, and business in literature. Department enforced prerequisites: open to seniors who have completed at least 30 semester hours of business courses with not less than a 3.30 GPA and have instructor consent.

Requisites: Requires prerequisite course of BCOR 2400 (minimum grade D-).

Additional Information: Arts Sciences Honors Course

MKTG 4820 (3) Special Topics in Marketing

Offered irregularly. Provides opportunity for investigation into new frontiers in marketing.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

MKTG 4825 (1-3) Pricing and Channels of Distribution

Offered irregularly to provide opportunity for investigation of new frontiers in Marketing.

Requisites: Requires prerequisite courses of MKTG 3250 and MKTG 3350 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior).

MKTG 4850 (3) Senior Seminar in Marketing

Capstone marketing course that integrates and further develops what students have learned in other courses. Provides students with the insight and skills necessary to formulate and implement sound socially responsible marketing strategies, product line management strategies, promotional and product/service communication strategies, pricing, and distribution strategies. Required for marketing majors.

Requisites: Requires prerequisite courses of MKTG 4250 and MKTG 4300; or MKTG 4250 and MKTG 4550; or MKTG 4300 and MKTG 4550 (all minimum grade D-). Restricted to senior Marketing (MKTG) majors with 102 to 180 units completed.

MKTG 4900 (1-6) Independent Study

Intended only for exceptionally well qualified business seniors. Instructor and division chair consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

MKTG 6900 (1-3) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

MKTG 6940 (1) Master's Candidate

Departmental form required.

Grading Basis: Pass/Fail

MKTG 6950 (1-6) Master's Thesis**MKTG 7300 (3) Multivariable Methods in Marketing Research**

Includes Manova designs, causal models, cluster analysis, discriminant function analysis, factor analysis, and latent structure analysis. Emphasizes computer applications. Department enforced prerequisites: graduate courses in regression and Manova.

MKTG 7310 (3) Design and Analysis of Experiments in Business

Detailed exposure to experimental research methods for business applications. Emphasizes the choice of design options, data collection methods, statistical analysis, and substantive interpretation of experimental results.

MKTG 7810 (3) Doctoral Seminar: Psychological Approaches to Research in Marketing

Examines the basic psychological processes that underlie common marketing phenomena. Topics include memory and judgment, persuasion, attitude-behavior consistency, information processing, automatic and controlled processes, learning, motivation and cognition, social judgment, and the role of affect and mood on judgment. Discusses topics in consumer behavior and marketing management contexts, in conjunction with related methodological issues.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MKTG 7815 (3) Doctoral Seminar: Consumer and Managerial Decision Making in Marketing

Examines judgment and decision making research pertinent to understanding how consumers and marketing managers make decisions. Uses economic models as a normative backdrop for examining research on decision heuristics, judgment and choice anomalies, and contingent decision behavior. Examines processes of causal judgment and inference and the influence of a variety of contextual factors (including time) on judgment and decision.

MKTG 7830 (3) Doctoral Seminar: Dissertation Research

Assists doctoral students in integrating courses and fields of study in order to be able to apply knowledge and skills to problems in marketing. Gives special attention to development of thesis topics.

MKTG 7835 (3) Marketing Strategy

Examine theories of marketing strategy emanating from economics, sociology, psychology, strategy and organizational sciences, as well as marketing. Levels of analysis for studying marketing strategy research will include the individual, dyadic, group, firm, interorganizational and industry levels. Examines methods for doing marketing strategy research, including experiments, quasi-experiments, surveys, qualitative data and secondary data.

MKTG 7840 (3) Quantitative Marketing Seminar 1

Provides a foundation for quantitative analysis in marketing. The empirical component covers fundamental empirical modeling techniques (e.g., field experiments, diffusion models, categorical data models, consumer heterogeneity). The theoretical components illustrates how utility maximizing consumers learn about consumption environment and respond to firms' marketing decisions and examines firms' competitive strategy and marketing mix decisions and relevant organizational and sociological factors.

MKTG 8900 (1-3) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

MKTG 8990 (1-10) Doctoral Thesis

Master of the Environment (ENVM)

Courses

ENVM 5001 (3) Foundations of Environmental Leadership

Engages and exposes students to diverse leadership models and styles and emphasizes concepts and skills necessary for effective environmental leadership. Students will explore and critically analyze approaches and tools for effective collaboration, creative communication with diverse stakeholders, facilitation of events and processes, negotiation, fiscal management, strategic planning, practicing design thinking, developing organizational structures and leading social change.

Grading Basis: Letter Grade

ENVM 5002 (3) Analyzing Socio-Environmental Systems

Learn to use a 'systems thinking' approach to address complex environmental challenges. The objective is to introduce students to thinking about environmental challenges in a holistic manner, helping them to understand the connectivity between different parts of the same system and to identify the synergies and trade-offs contained within most socio-environmental systems.

Grading Basis: Letter Grade

ENVM 5003 (3) Ethics and Values in Environmental Leadership

Prepares students to be effective leaders within their organizations by introducing them to a wide range of value systems and examining links between these and effective leadership. Students will learn tools and approaches for effective analysis and presentation of value-based appeals and will learn through practical scenarios to identify and assess value-based analyses used by others.

Grading Basis: Letter Grade

ENVM 6001 (1) Capstone Innovation Lab 1

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

Requisites: Restricted to Master of the Environment (MENV) graduate students only.

Grading Basis: Letter Grade

ENVM 6002 (1) Capstone Innovation Lab 2

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

Requisites: Requires a prerequisite course of ENVM 6001 (minimum grade C). Restricted to Master of the Environment (MENV) graduate students only.

Grading Basis: Letter Grade

ENVM 6003 (6) Capstone Project

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

Requisites: Requires a prerequisite course of ENVM 6002 (minimum grade C). Restricted to Master of the Environment (MENV) graduate students only.

Grading Basis: Letter Grade

ENVM 6004 (1) Capstone Innovation Lab 3

Providing hands-on, learning-by-doing experiences, while also providing client organizations with solutions to complex problems and useful products. Projects can take place in-residence with a client, when appropriate. Project ideas will be codeveloped by students and industry, government, or non-profit partners and will be guided and evaluated by a committee of ENVS faculty. Required for all MENV students.

Requisites: Requires a prerequisite course of ENVM 6003 (minimum grade C). Restricted to Master of the Environment (MENV) graduate students only.

Grading Basis: Letter Grade

Materials Science and Engineering (MSEN)

Courses

MSEN 5000 (1-3) Fundamentals of Materials Science and Engineering

Discusses fundamental topics in materials science and engineering.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

MSEN 5370 (3) Materials Thermodynamics

Reviews thermodynamics fundamentals and applies them to understand the chemical, thermal and mechanical behavior of materials. Examines equations of state, solution theory, equilibrium diagrams and phase changes.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

MSEN 5840 (1-6) Independent Study

Offers an opportunity for students to do independent work. Subject arranged to fit the needs of the student.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to MS and PhD students in the Materials Science and Engineering program (MTEN) only.

MSEN 5919 (1-5) Special Topics in MSE

Offers an opportunity for special topics in MSE. Subject arrangement to fit the needs of the program.

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to graduate students only.

MSEN 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to MS students in the Materials Science and Engineering program (MTEN) only.

MSEN 8990 (1-10) Doctoral Dissertation

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to PhD students in the Materials Science and Engineering program (MTEN) only.

Mathematics (MATH)

Courses

MATH 1005 (3) Introduction to College Mathematics

Introductory level mathematics course which presents a college level introduction to algebraic functions and their applications. Only offered through the Student Academic Service Center.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1011

Additional Information: MAPS Course: Mathematics

MATH 1011 (3) College Algebra

Covers simplifying algebraic expressions, factoring, linear and quadratic equations, inequalities, exponentials, logarithms, functions, graphs and systems of equations. Department enforced prerequisite: one year high school algebra.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1005

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MAPS Course: Mathematics

MATH 1012 (3) Quantitative Reasoning and Mathematical Skills

Promotes mathematical literacy among liberal arts students. Teaches basic mathematics, logic, and problem-solving skills in the context of higher level mathematics, science, technology, and/or society. This is not a traditional math class, but is designed to stimulate interest in and appreciation of mathematics and quantitative reasoning as valuable tools for comprehending the world in which we live.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1012

Additional Information: GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

MAPS Course: Mathematics

MATH 1021 (3) College Trigonometry

Covers trigonometric functions, identities, solutions of triangles, addition and multiple angle formulas, inverse and trigonometric functions and laws of sines and cosines. Department enforced prerequisite: MATH 1011 (minimum grade C-) or 1 1/2 years of high school algebra and 1 year of high school geometry.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1235 or MATH 1150

MATH 1071 (3) Finite Mathematics for Social Science and Business

Discusses systems of linear equations and introduces matrices, linear programming, and probability.

Requisites: Requires prerequisite course of MATH 1011 (minimum grade C-) or a score of 46% or greater on an ALEKS math exam taken in 2016 or earlier.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1081 (3) Calculus for Social Science and Business

Covers differential and integral calculus of algebraic, logarithmic and exponential functions. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 or MATH 1300 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admission data and/or CU Boulder coursework.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1110 (3) Mathematics for Elementary Educators 1

Includes a study of problem solving techniques in mathematics and the structure of number systems. Department enforced prereq., one year of high school algebra and one year of geometry. Department enforced restriction: restricted to prospective elementary teachers. The combination MATH 1110 and 1120 is approved for arts and sciences core curriculum: quantitative reasoning and mathematical skills.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1112 (4) Mathematical Analysis in Business

Gives students experience with mathematical problem solving in real business contexts. Students will work with data and spreadsheets to build and analyze mathematical models. Themes of the course include applying logical operators to model business rules, interpreting data and using tables and graphs, finding break-even and optimal points, and addressing uncertainty and forecasting

Equivalent - Duplicate Degree Credit Not Granted: MATH 1012

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1120 (3) Mathematics for Elementary Educators 2

Topics include geometry, measurement, probability, and statistics.

Department enforced restriction: restricted to prospective elementary teachers. The combination MATH 1110 and 1120 is approved for arts and sciences core curriculum: quantitative reasoning and mathematical skills.

Requisites: Requires prerequisite course of MATH 1110 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1130 (3) Mathematics from the Visual Arts

Introduces mathematical concepts through the study of visual arts.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills

MATH 1150 (4) Precalculus Mathematics

Develops techniques and concepts prerequisite to calculus through the study of trigonometric, exponential, logarithmic, polynomial and other functions. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1235 or MATH 1021

Requisites: Requires prerequisite course of MATH 1011 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework. Requires enrollment in corequisite course MATH 1151.

Additional Information: GT Pathways: GT-MA1 - Mathematics

Arts Sci Core Curr: Quant Reasn Mathmat Skills

MAPS Course: Mathematics

MATH 1151 (1) Precalculus Supplemental Lab

Provides students concurrently enrolled in MATH 1150 with supplemental instruction.

Requisites: Requires enrollment in corequisite course of MATH 1150.

Grading Basis: Letter Grade

MATH 1160 (3) Transition to Calculus (IBL): The Theory, Applications and Analysis of Functions

Examines the functions of calculus and how they can be used to model concrete problems and/or change. This is an intensive study of these functions through Inquiry-Based Learning. Each class will be designed so students will be actively engaged in learning the material in small groups. For more information about the math placement referred to in the "Enrollment Requirements", please contact your academic advisor.

Requisites: Requires an ALEKS math exam taken in 2016 or earlier, or placement into pre-calculus based on your admissions data and/or CU Boulder coursework.

MATH 1212 (3) Data and Models

Engages students in statistical and algebraic problem solving through modeling data and real world questions taken from the social and life sciences. The course will emphasize these skills and the mathematical background needed for a university level statistics course.

Equivalent - Duplicate Degree Credit Not Granted: MATH 1011

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1300 (5) Calculus 1

Topics include limits, derivatives of algebraic and transcendental functions, applications of the derivative, integration and applications of the definite integral. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 MATH 1081 or MATH 1310 or MATH 1330

Requisites: Requires prerequisite course of MATH 1011 and MATH 1021 or MATH 1150 or MATH 1160 or APPM 1235 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1310 (5) Calculus, Systems, and Modeling

Calculus concepts are developed through the analysis and modeling of complex systems, ranging from gene networks and cells to populations and ecosystems. Fundamental concepts of probability and statistics are also developed through the lens of calculus. MATH 1300 is similar, but a greater emphasis is placed on relevance and applications in biology and other life sciences. Students who have already earned college credit for calculus 1 are eligible to enroll in this course if they want to solidify their knowledge base in calculus 1. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1330

Requisites: Requires prerequisite course of APPM 1235 or MATH 1021 or MATH 1150 or MATH 1160 or MATH 1300 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 1330 (4) Calculus for Economics and the Social Sciences

A calculus course intended to meet the needs of social science and economics majors, including applications. Covers differential and integral calculus of algebraic, logarithmic and exponential functions and modeling. For more information about the math placement referred to in the "Enrollment Requirements", contact your academic advisor.

Equivalent - Duplicate Degree Credit Not Granted: APPM 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310

Requisites: Requires a prerequisite course of ECON 1078 or MATH 1011 or MATH 1071 or MATH 1150 or MATH 1160 (minimum grade C-) or an ALEKS math exam taken in 2016 or earlier, or placement into calculus based on your admissions data and/r CU Boulder coursework.

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 2001 (3) Introduction to Discrete Mathematics

Introduces the ideas of rigor and proof through an examination of basic set theory, existential and universal quantifiers, elementary counting, discrete probability, and additional topics. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

MATH 2130 (3) Introduction to Linear Algebra for Non-Mathematics Majors

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who do not plan to major in Mathematics. Formerly MATH 3130.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2135 or APPM 3310

Requisites: Requires prerequisite course of MATH 2300 or APPM 1360 (minimum grade C-).

MATH 2135 (3) Introduction to Linear Algebra for Mathematics Majors

Examines basic properties of systems of linear equations, vector spaces, inner products, linear independence, dimension, linear transformations, matrices, determinants, eigenvalues, eigenvectors and diagonalization. Intended for students who plan to major in Mathematics. Formerly MATH 3135.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2130 or APPM 3310

Requisites: Requires a prerequisite course of MATH 2300 or APPM 1360 and MATH 2001 (all minimum grade C-).

MATH 2300 (5) Calculus 2

Continuation of MATH 1300. Topics include transcendental functions, methods of integration, polar coordinates, differential equations, improper integrals, infinite sequences and series, Taylor polynomials and Taylor series. Department enforced prerequisite: MATH 1300 or MATH 1310 or APPM 1345 or APPM 1350 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: APPM 1360

MATH 2380 (3) Mathematics for the Environment

An interdisciplinary course where environmental issues, such as climate change, global epidemics, pollution, population models and kinship relations of Australian Aborigines are studied with elementary mathematics (such as fuzzy logic). Similar techniques are applied to analyze other current events, such as surveillance, economic meltdowns, identity theft and media literacy. Department enforced prerequisite: proficiency in high school mathematics.

Additional Information: GT Pathways: GT-MA1 - Mathematics
Arts Sci Core Curr. Quant Reasn Mathmat Skills

MATH 2400 (5) Calculus 3

Continuation of MATH 2300. Topics include vectors, three-dimensional analytic geometry, partial differentiation and multiple integrals, and vector analysis. Department enforced prerequisite: MATH 2300 or APPM 1360 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: APPM 2350

MATH 2510 (3) Introduction to Statistics

Elementary statistical measures. Introduces statistical distributions, statistical inference, hypothesis testing and linear regression. Department enforced prerequisite: two years of high school algebra.

Equivalent - Duplicate Degree Credit Not Granted: BCOR 1020

Additional Information: Arts Sci Core Curr. Quant Reasn Mathmat Skills
MAPS Course: Mathematics

MATH 3001 (3) Analysis 1

Provides a rigorous treatment of the basic results from elementary Calculus. Topics include the topology of the real line, sequences of numbers, continuous functions, differentiable functions and the Riemann integral.

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2130 or MATH 2135 (all minimum grade C-).

MATH 3110 (3) Introduction to Theory of Numbers

Studies the set of integers, focusing on divisibility, congruences, arithmetic functions, sums of squares, quadratic residues and reciprocity, and elementary results on distributions of primes.

Requisites: Requires prerequisite course of MATH 2001 (minimum grade C-).

MATH 3120 (3) Functions and Modeling

Engages the students in daily projects and occasional in-class labs designed to strengthen and expand knowledge of the topics in secondary mathematics, focusing especially on topics from algebra, precalculus and calculus. Projects and labs involve the use of multiple representations, transformations, data analysis techniques and interconnections among ideas from geometry, algebra, probability and calculus. Department enforced prereq., MATH 1300 or MATH 1310 or APPM 1350 (minimum grade C-).

Requisites: Requires prerequisite course of MATH 2001 (minimum grade C-).

MATH 3140 (3) Abstract Algebra 1

Studies basic properties of algebraic structures with a heavy emphasis on groups. Other topics, time permitting, may include rings and fields.

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 3170 (3) Combinatorics 1

Covers basic methods and results in combinatorial theory. Includes enumeration methods, elementary properties of functions and relations, and graph theory. Emphasizes applications.

Requisites: Requires prerequisite course of MATH 2001 (minimum grade C-).

MATH 3210 (3) Euclidean and Non-Euclidean Geometry

Axiomatic systems; Euclid's presentation of the elements of geometry; Hilbert's axioms; neutral, Euclidean and non-Euclidean geometries and their models.

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 3430 (3) Ordinary Differential Equations

Involves an elementary systematic introduction to first-order scalar differential equations, nth order linear differential equations, and n-dimensional linear systems of first-order differential equations. Additional topics are chosen from equations with regular singular points, Laplace transforms, phase plane techniques, basic existence and uniqueness and numerical solutions. Formerly MATH 4430.

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) or APPM 3310 (all minimum grade C-).

MATH 3450 (3) Introduction to Complex Variables

Theory of functions of one complex variable, including integrals, power series, residues, conformal mapping, and special functions. Formerly MATH 4450.

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 (minimum grade C-).

MATH 3510 (3) Introduction to Probability and Statistics

Introduces the basic notions of Probability: random variables, expectation, conditioning, and the standard distributions (Binomial, Poisson, Exponential, Normal). This course also covers the Law of Large Numbers and Central Limit Theorem as they apply to statistical questions: sampling from a random distribution, estimation, and hypothesis testing.

Equivalent - Duplicate Degree Credit Not Granted: MATH 2510 or MATH 4510

Requisites: Requires prerequisite courses of MATH 2001 and MATH 2300 or APPM 1360 (all minimum grade C-).

MATH 3850 (1) Seminar in Guided Mathematics Instruction

Provides learning assistants with an opportunity to analyze assessment data for formative purposes and develop instructional plans as a result of these analyses. These formative assessment analyses will build on the literature in the learning sciences. Students gain direct experiences interacting with the tools of the trade, especially with actual assessment data and models of instruction. Restricted to learning assistants in Math.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a corequisite course of EDUC 4610.

Grading Basis: Pass/Fail

MATH 4000 (3) Foundations of Mathematics

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5000

Requisites: Requires prerequisite courses of MATH 2001 and MATH 3001 or MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) or MATH 3140 or MATH 3210 (all minimum grade C-).

MATH 4001 (3) Analysis 2

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

Equivalent - Duplicate Degree Credit Not Granted: MATH 5001

Requisites: Requires prerequisite courses of MATH 3001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 4120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5120 and APPM 4120 and APPM 5120

Requisites: Requires prerequisite course of MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) or APPM 3310 (minimum grade C-).

MATH 4140 (3) Abstract Algebra 2

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5140

Requisites: Requires prerequisite course of MATH 3140 (minimum grade C-).

MATH 4200 (3) Introduction to Topology

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5200

Requisites: Requires prerequisite course of MATH 3001 (minimum grade C-).

MATH 4230 (3) Differential Geometry of Curves and Surfaces

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5230

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) and MATH 2001 (all minimum grade C-).

MATH 4240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5240

Requisites: Requires prerequisite courses of MATH 3001 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 4330 (3) Fourier Analysis

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5330

Requisites: Requires prerequisite course of MATH 3001 (minimum grade C-).

MATH 4440 (3) Mathematics of Coding and Cryptography

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5440

Requisites: Requires prerequisite course of MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (minimum grade C-).

MATH 4470 (3) Partial Differential Equations

Studies initial, boundary, and eigenvalue problems for the wave, heat, and potential equations. Solution by separation of variables, Green's function, and variational methods.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5470

Requisites: Requires prerequisite courses of MATH 3430 (minimum grade C-).

MATH 4510 (3) Introduction to Probability Theory

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

Equivalent - Duplicate Degree Credit Not Granted: APPM 3570 or ECEN 3810 or MATH 3510 MATH 5510

Requisites: Requires prerequisite courses of MATH 2400 or APPM 2350 and MATH 2130 (formerly MATH 3130) or MATH 2135 (formerly MATH 3135) (all minimum grade C-).

MATH 4520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5520 and APPM 4520 and APPM 5520

Requisites: Requires prerequisite course of MATH 4510 or APPM 3570 (minimum grade C-).

MATH 4540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5540 and APPM 4540 and APPM 5540

Requisites: Requires prerequisite course of MATH 4520 or APPM 4520 (minimum grade C-).

MATH 4650 (3) Intermediate Numerical Analysis 1

Focuses on numerical solution of nonlinear equations, interpolation, methods in numerical integration, numerical solution of linear systems, and matrix eigenvalue problems. Stresses significant computer applications and software. Department enforced restriction: knowledge of a programming language.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4650

Requisites: Requires a prerequisite course of MATH 3430 or APPM 2360 and APPM 3310 (minimum grade C-).

MATH 4660 (3) Intermediate Numerical Analysis 2

Continuation of MATH 4650. Examines numerical solution of initial-value problems and two-point boundary-value problems for ordinary differential equations. Also looks at numerical methods for solving partial differential equations.

Equivalent - Duplicate Degree Credit Not Granted: APPM 4660

Requisites: Requires prerequisite course of MATH 4650 (minimum grade C-).

MATH 4730 (3) Set Theory

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5730

Requisites: Prereq. courses of MATH 2001 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

MATH 4805 (1) Mathematical Teacher Training: Inclusive Pedagogy

Designed to train students to teach mathematics in an inclusive, multicultural environment. Students teach a math course within the McNeill Academic Program (Student Academic Services Center) meeting weekly with faculty and colleagues to learn to re-design curriculum, fine-tune pedagogical practices, create assessments, mentor undergraduate instructor assistants and create an inclusive classroom environment. Department enforced restriction: experience with college-level instruction.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Seniors) or graduate students only.

MATH 4810 (1-3) Special Topics in Mathematics

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5810

Repeatable: Repeatable for up to 7.00 total credit hours.

MATH 4820 (3) History of Mathematical Ideas

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5820

Requisites: Prereq. courses of MATH 2001 and one of the following: MATH 3001, 3110, 3120, 3140, 3170, 3210, 3430, 3450, 3510, 3850, 4000, 4001, 4120, 4140, 4200, 4230, 4330, 4440, 4510, 4520, 4540, 4650, 4660 or 4820 (all min grade C-).

Recommended: completion of upper division Written Communication requirement.

MATH 4890 (1-3) Honors Independent Study

Offered for students doing a thesis for departmental honors.

Additional Information: Arts Sciences Honors Course

MATH 4900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

MATH 5000 (3) Foundations of Mathematics

Focuses on a complete deductive framework for mathematics and applies it to various areas. Presents Goedel's famous incompleteness theorem about the inherent limitations of mathematical systems. Uses idealized computers to investigate the capabilities and limitations of human and machine computation. Department enforced prerequisites: MATH 2130 and MATH 3140.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4000

Requisites: Restricted to graduate students only.

MATH 5001 (3) Analysis 2

Provides a rigorous treatment of infinite series, sequences of functions and an additional topic chosen by the instructor (for example, multivariable analysis, the Lebesgue integral or Fourier analysis).

Equivalent - Duplicate Degree Credit Not Granted: MATH 4001

Requisites: Restricted to graduate students only.

MATH 5030 (3) Intermediate Mathematical Physics 1

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory, and Fourier analysis. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5030

Requisites: Restricted to graduate students only.

MATH 5040 (3) Intermediate Mathematical Physics 2

Surveys classical mathematical physics, starting with complex variable theory and finite dimensional vector spaces. Discusses topics in ordinary and partial differential equations, the special functions, boundary value problems, potential theory and Fourier analysis. Department enforced prerequisite: MATH 5030.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5040

Requisites: Restricted to graduate students only.

MATH 5120 (3) Introduction to Operations Research

Studies linear and nonlinear programming, the simplex method, duality, sensitivity, transportation, and network flow problems, some constrained and unconstrained optimization theory, and the Kuhn-Tucker conditions, as time permits. Department enforced prerequisite: MATH 2130 or MATH 2135 or APPM 3310. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4120 and

APPM 4120 and APPM 5120

Requisites: Restricted to graduate students only.

MATH 5140 (3) Abstract Algebra 2

Explores some topic that builds on material in MATH 3140. Possible topics include (but are not limited to) Galois theory, representation theory, advanced linear algebra or commutative algebra. Department enforced prerequisite: MATH 3140.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4140

Requisites: Restricted to graduate students only.

MATH 5150 (3) Linear Algebra

Highlights vector spaces, linear transformations, eigenvalues and eigenvectors, and canonical forms. Department enforced prerequisite: MATH 2130 or MATH 2135. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5200 (3) Introduction to Topology

Introduces the basic concepts of point set topology. Includes topological spaces, metric spaces, homeomorphisms, connectedness and compactness.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4200

MATH 5230 (3) Differential Geometry of Curves and Surfaces

Introduces the modern differential geometry of plane curves, space curves, and surfaces in 3-dimensional space. Topics include the Frenet frame, curvature and torsion for space curves; Gauss and mean curvature for surfaces; Gauss and Codazzi equations, and the Gauss-Bonnet theorem.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4230

Requisites: Restricted to graduate students only.

MATH 5240 (3) Hilbert Spaces and the Mathematics of Quantum Mechanics

Provides an introduction to Hilbert spaces and their application in quantum mechanics. The primary goal is to prove and understand the so-called spectral theorem, which is crucial for the formulation of quantum mechanics. In addition, some examples from physics will be discussed, such as the quantum harmonic oscillator and the spectrum of the hydrogen atom.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4240

Requisites: Restricted to graduate students only.

MATH 5330 (3) Fourier Analysis

The notion of Fourier analysis, via series and integrals, of periodic and nonperiodic phenomena is central to many areas of mathematics. Develops the Fourier theory in depth and considers such special topics and applications as wavelets, Fast Fourier Transforms, seismology, digital signal processing, differential equations, and Fourier optics. Department enforced prerequisite: MATH 4001.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4330

Requisites: Restricted to graduate students only.

MATH 5430 (3) Ordinary Differential Equations

Introduces theory and applications of ordinary differential equations, including existence and uniqueness theorems, qualitative behavior, series solutions, and numerical methods, for scalar equations and systems.

Department enforced prerequisites: MATH 2130 and MATH 3001.

Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5440 (3) Mathematics of Coding and Cryptography

Gives an introduction, with proofs, to the algebra and number theory used in coding and cryptography. Basic problems of coding and cryptography are discussed; prepares students for the more advanced ECEN 5682.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4440

Requisites: Restricted to graduate students only.

MATH 5470 (3) Partial Differential Equations

Studies initial boundary and eigenvalue problems for the wave, heat and potential equations. Solution by separation of variables, Green's function, and variational methods. Department enforced prerequisite: MATH 3430 or MATH 5430. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4470

Requisites: Restricted to graduate students only.

MATH 5510 (3) Introduction to Probability Theory

Studies axioms, combinatorial analysis, independence and conditional probability, discrete and absolutely continuous distributions, expectation and distribution of functions of random variables, laws of large numbers, central limit theorems, and simple Markov chains if time permits.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4510

Requisites: Restricted to graduate students only.

MATH 5520 (3) Introduction to Mathematical Statistics

Examines point and confidence interval estimation. Principles of maximum likelihood, sufficiency, and completeness: tests of simple and composite hypotheses, linear models, and multiple regression analysis if time permits. Analyzes various distribution-free methods. Department enforced prerequisite: MATH 4510 or MATH 5510 or APPM 3570.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4520 and APPM 4520 and APPM 5520

Requisites: Restricted to graduate students only.

MATH 5540 (3) Introduction to Time Series

Studies basic properties, trend-based models, seasonal models, modeling and forecasting with ARIMA models, spectral analysis and frequency filtration. Department enforced prerequisite: MATH 4520 or MATH 5520 or APPM 4520 or APPM 5520.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4540 and APPM 4540 and APPM 5540

Requisites: Restricted to graduate students only.

MATH 5600 (3) Numerical Analysis 1

Solution of nonlinear algebraic equations, interpolation, approximation theory and numerical integration. Department enforced prerequisites: MATH 2130 or MATH 2135 or APPM 3310 and experience with a scientific programming language. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5610 (3) Numerical Analysis 2

Solution of linear systems, eigenvalue problems, optimization problems, and ordinary and partial differential equations. Department enforced prerequisite: MATH 5600 or APPM 5600. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 5730 (3) Set Theory

Studies in detail the theory of cardinal and ordinal numbers, definition by recursion, the statement of the continuum hypothesis, simple cardinal arithmetic and other topics chosen by the instructor.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4730

MATH 5810 (1-3) Special Topics in Mathematics

Covers various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4810

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

MATH 5820 (3) History of Mathematical Ideas

Examines the evolution of a few mathematical concepts (e.g., number, geometric continuum, or proof), with an emphasis on the controversies surrounding these concepts. Begins with Ancient Greek mathematics and traces the development of mathematical concepts through the middle ages into the present.

Equivalent - Duplicate Degree Credit Not Granted: MATH 4820

Requisites: Restricted to graduate students only.

Recommended: Prerequisite completion of upper division Written Communication requirement.

MATH 5905 (1) Mathematics Teacher Training

Designed to train students to become effective teachers. Students teach a mathematics course, meeting weekly with faculty to discuss problems particular to the teaching of mathematics. Department enforced prerequisite: current employment as a teaching assistant.

Requisites: Restricted to graduate students only.

MATH 6000 (3) Model Theory

Proves the compactness theorem, showing the essential finiteness of logical implication. Proves many basic properties of theories, showing how the syntactic form of statements influences their behavior w.r.t., different models. Finally, studies properties of elements that cannot be stated by a single formula (the type of the element) and shows it can be used to characterize certain models.

Requisites: Restricted to graduate students only.

MATH 6010 (3) Computability Theory

Studies the computable and uncomputable. Shows that there are undecidable problems and from there builds up the theory of sets of natural numbers under Turing reducibility. Studies Turing reducibility, the arithmetical hierarchy, oracle constructions and end with the finite injury priority method. Department enforced prerequisite: MATH 6000.

Requisites: Restricted to graduate students only.

MATH 6110 (3) Introduction to Number Theory

Examines divisibility properties of integers, congruences, diophantine equations, arithmetic functions, quadratic residues, distribution of primes and algebraic number fields. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6130 (3) Algebra 1

Studies group theory and ring theory. Department enforced prerequisite: MATH 3140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6140 (3) Algebra 2

Studies modules, fields and Galois theory. Department enforced prerequisite: MATH 6130. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6150 (3) Commutative Algebra

Introduces topics used in number theory and algebraic geometry, including radicals of ideals, exact sequences of modules, tensor products, Ext, Tor, localization, primary decomposition of ideals and Noetherian rings. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6170 (3) Algebraic Geometry

Introduces algebraic geometry, including affine and projective varieties, rational maps and morphisms and differentials and divisors. Additional topics might include Bezout's Theorem, the Riemann-Roch Theorem, elliptic curves, and sheaves and schemes. Department enforced prerequisite: MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6180 (3) Algebraic Number Theory

Introduces number fields and completions, norms, discriminants and differentials, finiteness of the ideal class group, Dirichlet's unit theorem, decomposition of prime ideals in extension fields, decomposition and ramification groups. Department enforced prerequisites: MATH 6110 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6190 (3) Analytic Number Theory

Acquaints students with the Riemann Zeta-function and its meromorphic continuation, characters and Dirichlet series, Dirichlet's theorem on primes in arithmetic progressions, zero-free regions of the zeta function and the prime number theorem. Department enforced prerequisites: MATH 6110 and MATH 6350. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6210 (3) Introduction to Topology 1

Introduces elements of point-set topology and algebraic topology, including the fundamental group and elements of homology. Department enforced prerequisites: MATH 2130 and MATH 3140 and MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6220 (3) Introduction to Topology 2

Continuation of MATH 6210. Department enforced prerequisite: MATH 6210. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6230 (3) Introduction to Differential Geometry 1

Introduces topological and differential manifolds, vector bundles, differential forms, de Rham cohomology, integration, Riemannian metrics, connections and curvature. Department enforced prerequisites: MATH 2130 and MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6240 (3) Introduction to Differential Geometry 2

Continuation of MATH 6230. Department enforced prerequisite: MATH 6230. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6250 (3) Theory of Rings

Studies semi-simple Artinian rings, the Jacobson radical, group rings, representations of finite groups, central simple algebras, division rings and the Brauer group. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6260 (3) Geometry of Quantum Fields and Strings

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories. Department enforced prerequisites: MATH 6230 and MATH 6240 and PHYS 5250 and PHYS 7280. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 6260

Requisites: Restricted to graduate students only.

MATH 6270 (3) Theory of Groups

Studies nilpotent and solvable groups, simple linear groups, multiply transitive groups, extensions and cohomology, representations and character theory, and the transfer and its applications. Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6280 (3) Advanced Algebraic Topology

Covers homotopy theory, spectral sequences, vector bundles, characteristic classes, K-theory and applications to geometry and physics. Department enforced prerequisite: MATH 6220. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6290 (3) Homological Algebra

Studies categories and functors, abelian categories, chain complexes, derived functors, Tor and Ext, homological dimension, group homology and cohomology. If time permits, the instructor may choose to cover additional topics such as spectral sequences or Lie algebra homology and cohomology. Department enforced prerequisites: MATH 6130 and MATH 6140.

Requisites: Restricted to graduate students only.

MATH 6310 (3) Introduction to Real Analysis 1

Develops the theory of Lebesgue measure and the Lebesgue integral on the line, emphasizing the various notions of convergence and the standard convergence theorems. Applications are made to the classical L^p spaces. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6320 (3) Introduction to Real Analysis 2

Covers general metric spaces, the Baire Category Theorem, and general measure theory, including the Radon-Nikodym and Fubini theorems. Presents the general theory of differentiation on the real line and the Fundamental Theorem of Lebesgue Calculus. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite MATH 6310.

MATH 6350 (3) Functions of a Complex Variable 1

Focuses on complex numbers and the complex plane. Includes Cauchy-Riemann equations, complex integration, Cauchy integral theory, infinite series and products, and residue theory. Department enforced prerequisite: MATH 4001. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6360 (3) Functions of a Complex Variable 2

Focuses on conformal mapping, analytic continuation, singularities and elementary special functions. Department enforced prerequisite: MATH 6350. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6534 (3) Topics in Mathematical Probability

Offers selected topics in probability such as sums of independent random variables, notions of convergence, characteristic functions, Central Limit Theorem, random walk, conditioning and martingales, Markov chains and Brownian motion. Department enforced prerequisite: MATH 6310. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6550 (3) Introduction to Stochastic Processes

Systematic study of Markov chains and some of the simpler Markov processes, including renewal theory, limit theorems for Markov chains, branching processes, queueing theory, birth and death processes, and Brownian motion. Applications to physical and biological sciences. Department enforced prerequisite: MATH 4001 or MATH 4510 or APPM 3570 or APPM 4560. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: APPM 6550

Requisites: Restricted to graduate students only.

MATH 6730 (3) Set Theory

Presents cardinal and ordinal arithmetic, and basic combinatorial concepts, including stationary sets, generalization of Ramsey's theorem, and ultrafilters, consisting of the axiom of choice and the generalized continuum hypothesis. Department enforced prerequisites: MATH 4000 or MATH 5000 and MATH 4730 or MATH 5730. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6740 (3) Forcing

Presents independence of the axiom of choice and the continuum hypothesis, Souslin's hypothesis and other applications of the method of forcing. Introduces the theory of large cardinals. Department enforced prerequisite: MATH 6730. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 6900 (1-3) Independent Study

Instructor consent required for undergraduates.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MATH 6940 (1) Master's Degree Candidate

This course is for students preparing for the no-thesis option for a master's degree. The content is set by the students' advisors.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

MATH 6950 (1-6) Master's Thesis**MATH 8114 (3) Topics in Number Theory**

May include the theory of automorphic forms, elliptic curves, or any of a variety of advanced topics in analytic and algebraic number theory. Department enforced prerequisite: MATH 6110. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8174 (3) Topics in Algebra I

Department enforced prerequisites: MATH 6130 and MATH 6140. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8250 (3) Mathematical Theory of Relativity 1

Focuses on Maxwell equations, Lorentz force, Minkowski space-time, Lorentz, Poincare, and conformal groups, metric manifolds, covariant differentiation, Einstein space-time, cosmologies, and unified field theories. Instructor consent required.

Requisites: Restricted to graduate students only.

MATH 8304 (3) Topics in Analysis I

Presents advanced topics in analysis including Lie groups, Banach algebras, operator theory, ergodic theory, representation theory, etc. Department enforced prerequisites: MATH 8330 and MATH 8340. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8330 (3) Functional Analysis 1

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisites: MATH 6310 and MATH 6320. Instructor consent required for undergraduates. See also MATH 8340.

Requisites: Restricted to graduate students only.

MATH 8340 (3) Functional Analysis 2

Introduces such topics as Banach spaces (Hahn-Banach theorem, open mapping theorem, etc.), operator theory (compact operators and integral equations and spectral theorem for bounded self-adjoint operators) and Banach algebras (the Gelfand theory). Department enforced prerequisite: MATH 8330. Instructor consent required for undergraduates. See also MATH 8330.

Requisites: Restricted to graduate students only.

MATH 8370 (3) Harmonic Analysis 1

Examines trigonometric series, periodic functions, diophantine approximation and Fourier series. Also covers Bohr and Stepanoff almost periodic functions, positive definite functions and the L^1 and L^2 theory of the Fourier integral. Applications to group theory and differential equations. Department enforced prerequisites: MATH 5150 and MATH 6320. Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

MATH 8714 (3) Topics in Logic 1 and 2

Requisites: Restricted to graduate students only.

MATH 8815 (1-3) Ulam Seminar

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MATH 8900 (1-3) Independent Study

Instructor consent required for undergraduates.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MATH 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School portion of the catalog.

Requisites: Restricted to graduate students only.

MBA Advanced Electives (MBAX)

Courses

MBAX 6051 (2) Strategy

Analyzes how firms can attain and sustain competitive advantage in today's competitive environment. Focuses on industry dynamics, competitive positioning, firm capabilities, and corporate innovation. Introduces a set of tools for assisting managers in solving complex, real-world business problems in strategy development. Integrates MBA learning in functional areas, and emphasizes the fit between competitive analysis and the role of management and organization.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6100 (3) Entrepreneurship

Examines the environments of entrepreneurial firms from start-up to development of ventures. Allows students to assess their fit with entrepreneurial firms. Key element is learning the process of determining the difference between ideas and commercializable opportunities through feasibility analysis and plans.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6101 (2) Entrepreneurship

Examines the environments of entrepreneurial firms from start-up to development of ventures; allows students to assess their "fit" with entrepreneurial firms. A key element is learning the process of determining the difference between ideas and commercializable opportunities through feasibility analysis and plans.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6110 (3) Entrepreneurial Finance

Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6111 (2) Entrepreneurial Finance

Addresses a variety of topics including financial valuation, various sources of funds, structures and legal issues in arranging financing, the private and public venture capital markets, and preparation for, and execution of, an initial public securities offering.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-).

Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6120 (3) Entrepreneurial Marketing

Addresses the marketing challenges that face the entrepreneur or start up firm with a limited budget. From initially positioning the company and its products to marketing that position to key shareholders for a new venture, to establishing channels of distribution and reaching the consumer, take a specialized look at the development and implementation of a marketing plan.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6140 (3) Social Entrepreneurship in Emerging Markets

Social entrepreneurs adopt business approaches to solving global, social and environmental problems that have not been effectively addressed by government, business or traditional nonprofits. The course provides a framework for student teams to assist social entrepreneurs in developing countries, helping them achieve their social mission while operating sustainably and with measurable impact.

Requisites: Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Recommended: Prerequisite MBAX 6170.

Additional Information: Departmental Category: MBA: Social Responsibility

MBAX 6150 (3) Entrepreneurship and the Venture Capital Process

This course is articulated into two main parts, tightly interrelated: entrepreneurship and the venture capital process. The first part has the objective to lead the students to understand what venture capital is, how it works, how you structure capital raising and how it helps entrepreneurial initiatives. The second part concerns how venture capitalists manage their operations, secure investment deals and maintain their portfolios. Formerly MBAX 6805.

Requisites: Requires prereq courses of MBAC 6011, 6020, 6031, 6060, 6080 and 6090 (all min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6170 (3) Business Plan Preparation

Completion of a sophisticated business plan within task groups from concept through all the elements of a professionally written business plan. Provides students high interaction with businesses and entrepreneurs.

Requisites: Requires prerequisite courses of MBAC 6020 and MBAX 6100 (all minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6171 (2) Business Plan Preparation

In this course students will be responsible for the completion of a sophisticated business plan within task groups from the concept through all the elements of a professionally written business plan. The course provides students high interaction with businesses and entrepreneurs.

Requisites: Requires prerequisite courses of MBAX 6100, MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6180 (3) Startup Execution

Covers a variety of topics in applied entrepreneurship, including the steps required to legally launch a business and procedures for executing standard business functions (organization, marketing, sales, advertising, operations, team building, and finance) with minimal resources (cash, personnel, and equipment).

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6190 (3) Projects in Entrepreneurial Companies

Limited to 12 students per section, each student is matched with an entrepreneurial company to complete a project that is key to company strategy. Students experience total company environment from the top management level through attending management meetings and interacting with cross-functional managers and employees. E-mail and face-to-face meetings result in discussing opportunities and issues resulting from experiences in companies.

Requisites: Requires prerequisite course of MBAX 6100 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6200 (3) Advanced Corporate Finance

Covers the theory of asset pricing, which is then applied to capital budgeting, capital structure choice, mergers and acquisitions, and risk management.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6210 (3) Applied Financial Management

Analyzes the financial condition, planning, and control of current assets, current liabilities, and long-term financial arrangements. Topics include financial planning, managing working capital, short- and long-term financing, capital budgeting, valuation, and capital structure policies. Case studies are emphasized.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6211 (2) Applied Financial Management

Focuses on how to apply key concepts in finance to real-world situations. Topics include valuation, capital structure, highly leveraged transactions, and financial distress and bankruptcy. Heavy emphasis on how to perform various kinds of valuations. Mixture of lectures and case discussions.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6220 (3) Investment Management and Analysis

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6221 (2) Investment Management & Analysis

Covers managing investment portfolios by blending academic theories and evidence with practitioner experience. Topics include risk and return relationships, securities, value theory (capital asset, arbitrage, and option pricing), portfolios, and performance evaluations.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6230 (3) International Financial Management

Examines the financial procedures, policies, and risks faced by firms conducting business internationally. Topics include examining the international finance environment, managing foreign exchange risk exposure, managing international working capital, conducting analysis, and developing an understanding of international financial markets.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6240 (3) Financial Markets, Institutions and Regulations

Focuses on the legal and regulatory issues surrounding complex transactions that involve change of ownership. Topics include law/regulation issues affecting all stakeholders involved in corporate restructuring transactions, the legal aspects of the corporate bankruptcy process and the practical aspects of raising capital, such as understanding the instruments and the institutions involved in the financing activities of firms at different stages in their lifecycle, road shows and the mechanics of pursuing initial public offering.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Finance

MBAX 6250 (3) Derivative Securities

Derivatives, like options, futures, forwards, and swaps, encompass all aspects of finance. Topics cover the characteristics, valuation, and trading strategies associated with derivatives as well as their use in risk management.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6260 (3) Fixed Income Investing

Fixed income securities are those that nominally promise a fixed stream of payments. They include government and corporate long and short term debt issues that far exceed the amount of corporate stock issues, as well as long term personal debt (i.e., home mortgages). Develops practical analytical tools for describing risk and return in fixed income securities, the markets where they are traded, and their purchase and management by financial intermediaries. This course will utilize the Bloomberg Lab to provide students with real world fixed income security analysis.

Requisites: Requires prerequisite course of MBAC 6060 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6270 (3) Applied Derivatives

Covers applications of financial derivatives and a range of topics, from market risk management to liquidity and counter party risk management in contemporary finance. Specifically, the course examines the pricing and use of financial derivatives, including options, forwards, futures, swaps and credit derivatives in risk management.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

MBAX 6300 (3) Marketing Communication

Focuses on the strategic and decision making aspects of marketing communication from a managerial perspective. Increases students' understanding of specific decision elements within an integrated marketing communications framework. Topics include promotional objectives, agency relations, media selection, budgeting, and advertising research. Also explores relevant advertising models and the economic and social effects of promotional activity.

Requisites: Requires prereq course of MBAC 6090 (min grade D-).

Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA), Supply Chain Mgmt (SCMN) or Busn Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Marketing

MBAX 6301 (2) Marketing Communications

Focuses on the strategic and decision-making aspects of marketing communication from a managerial perspective. Designed to increase students' understanding of specific decision elements within an integrated marketing communications framework. Topics covered include promotional objectives, agency relations, media selection, budgeting, and advertising research. Explores relevant advertising models and the economic and social effects of promotional activity.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-).

Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Marketing

MBAX 6310 (3) Marketing Strategy

Marketing strategy has developed into an increasingly critical managerial activity as businesses recognize the importance of creating customer value and being customer oriented. Discusses key elements of successful marketing strategy including market/customer analysis and competitor analysis, and identifies strategic approaches managers may adopt to succeed in today's highly competitive and rapidly changing business environment.

Requisites: Requires prereq course of MBAC 6090 (min grade D-).

Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA), Supply Chain Mgmt (SCMN) or Busn Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6311 (2) Marketing Strategy

Marketing strategy is a critical managerial activity that recognizes the importance of a strong market focus and the delivery of superior customer value as bases for long term financial success. This course examines key elements of successful marketing strategy including optimal market definition, strong segmentation and positioning approaches, high levels of customer satisfaction, and effective management of critical exchange relationships.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Marketing

MBAX 6330 (3) Market Intelligence

Market Intelligence is a decision-oriented course geared toward gathering, analyzing, and interpreting data about markets and customers. Students learn how to: define the marketing problem and determine what information is needed to make the decision; acquire trustworthy and relevant data and judge its quality; analyze the data and acquire the necessary knowledge to make certain classic types of marketing decisions.

Requisites: Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA), Supply Chain Mgmt (SCMN) or Busn Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6331 (2) Market Intelligence

Market Intelligence is a marketing decision-oriented course geared toward gathering, analyzing, and interpreting data about markets and customers for both products and services. It is for managers as users of market information across marketing management, consulting, general management, and entrepreneurship to address problems of market selection, segmentation, positioning, new products, customer value and retention, pricing, communication, channel, etc.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Marketing

MBAX 6340 (3) Marketing Field Project

Develops skills in marketing decision making. Teams design and complete a project located at a client business or other organization in the metropolitan area. Team members organize and assign responsibilities, interact with middle- and top-level managers, apply quantitative and behavioral tools presented in marketing and other courses, meet deadlines, and present results of project activities

Requisites: Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA), Supply Chain Mgmt (SCMN) or Busn Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Finance

MBAX 6350 (3) Digital Marketing

Covers a variety of ways an organization uses online presence to support its goals. The main approaches covered are search engine optimization (SEO); online advertising, especially search ads (also called search engine marketing, SEM); and social media. SEO is setting up your website so that the right people can find you. Emphasis placed on selecting keywords and tracking responses to changes to a website. SEM refers to paid ("sponsored") ads on search engines. We will focus on AdWords.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6351 (2) Digital Marketing

Covers a variety of ways an organization uses online presence to support its goals. The main approaches covered are search engine optimization (SEO); online advertising, especially search ads (also called search engine marketing, SEM); and social media. SEO is setting up your website so that the right people can find you. Emphasis placed on selecting keywords and tracking responses to changes to a website. SEM refers to paid ("sponsored") ads on search engines. We will focus on AdWords.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Marketing

MBAX 6360 (3) New Product Development

Provides a better understanding of the new-product development process, highlighting the inherent risks and strategies for overcoming them. Using a combination of lectures, cases, and a project, this course examines the process of designing, testing, and launching new products. Emphasizes the interplay between creativity and analytical marketing research throughout the development process. Also covers branding issues, such as brand extensions and their impact on brand equity.

Requisites: Requires prereq course of MBAC 6090 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Prog (PMBA), Supply Chain Mgmt (SCMN) or Busn Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6361 (2) New Product Development

Provides students with a better understanding of the new-product development process, highlighting the inherent risks and different strategies for overcoming them. Using a combination of lectures, cases, and a project, this course will examine the process of designing, testing and launching new products.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Marketing

MBAX 6410 (3) Process Analytics

Covers the concepts and tools to design and manage business processes. Emphasizes modeling and analysis, information technology support for process activities, and management of process flows. Graphical simulation software is used to create dynamic models of business processes and predict the effect of changes. Prepares students for a strong management or consulting career path in business processes.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Systems

MBAX 6420 (3) IT and Business Strategy

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. Combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoptions efforts to success.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Systems

MBAX 6421 (2) IT & Business Strategy

Although some companies are very successful in discovering and cultivating innovative technology-enabled business strategies, many fail in the process. This course combines theories and frameworks with practical approaches to provide students with the skills required to help companies identify business opportunities, find appropriate information related technologies, and lead adoption efforts to success.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6440 (3) Project Management

Acquaints students with multidisciplinary aspects of project management, including the relationship between schedule, cost and performance. The course uses a hands-on project where the student interacts with a real customer, providing an opportunity to utilize the qualitative and quantitative tools taught in the classroom. At the conclusion of the course, the student may be eligible to apply for a project management certification from Project Management Institute based on previous work experience.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6441 (2) Project Management

Acquaints the student with multidisciplinary aspects of project management, including the relationship between scope, schedule, cost and performance. Uses a hands-on project from your own company, providing an opportunity to utilize the qualitative and quantitative tools taught in the classroom. During the course students will earn hours toward project management certification from the Project Management Institute.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6450 (3) International Operations Management

Takes a broad comprehensive perspective on managing and operating in a rapidly growing global economy. Explores regional and national approaches to international operations including trade practices; penetration strategies; financial, marketing, services, and manufacturing operations; ethical and sustainability issues; and global competitive strategy. Compares global business practices in Asia, South America, Europe, and Africa.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Management

MBAX 6460 (3) Supply Chain Management

Explores the key issues related to the design and management of supply chains. Covers the efficient integration of suppliers, production facilities, warehouses and stores so that the right products in the right quantity reach customers at the right time. Focuses on the minimization of the total supply chain cost subject to service requirements imposed by a variety of industries.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Recommended: Prerequisite MBAC 6080.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Systems

MBAX 6500 (3) Management of Organizational Change

Explores ways to improve organizations to meet demands of changing environments. Emphasizes theoretical framework and models of organization change, barriers to implementing change and ways to overcome them, and the roles of the change agent and/or consultant.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6530 (3) Negotiating and Conflict Management

Explores and builds skills for conflict management and negotiation problems faced by managers (e.g., dealing with subordinates, peers, superiors, or clients). Content is relevant to all MBA students, especially those interested in management, accounting, entrepreneurship, finance, and marketing.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6531 (2) Negotiations

Practice the art and science of successful negotiations. Provides students high interaction with businesses and entrepreneurs.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6540 (3) Consulting Skills

Provides an integrative, hands-on exercise in managing change. Develops skills in contracting, collecting, and analyzing data, developing action plans, and preparing reports. Teams practice these skills by conducting an organizational diagnosis, consulting project within an organization.

Requisites: Requires a prerequisite course of MBAC 6040 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6550 (3) Management of Technology and Innovation

Examines a variety of issues common to management of technology, such as technology strategies, methods of technology transfer, selecting technology standards, managing the research and development process, and encouraging and rewarding innovation.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6560 (3) Executive Leadership

Examines organizational leadership from the executive perspective, including private and public sector firms, and non-profits. Studies how executives lead change and innovation, interact with the top management team, and deal with the board of directors. Topics include governance of the firm, strategies for enhancing executive influence, assessing and understanding diverse leadership styles, and the ethics and responsibilities of an executive. Formerly MBAX 6890.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6561 (2) Executive Leadership

Provides an opportunity to examine leadership from the executive perspective in organizations including private and public sector firms and non-profits. Topics covered include how executives lead change and innovation in organizations, interact with the top management team, deal with the board of directors, leadership issues involved with governance of the firm and strategies for enhancing executive influence.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6570 (3) Topics in Sustainable Business

Provides a comprehensive overview of the core concepts, strategies and practices of sustainable business, emphasizing innovative business practices and entrepreneurial opportunities created by the sustainability "movement". The topic of sustainability will be approached from the unique perspectives of seven core disciplines of business administration: economics, strategy, ethics, organizational behavior, operations, finance and accounting, and marketing.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to MBAD, DMBA, JMBA, PMBA, SCMN or BUAN majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Social Responsibility

MBAX 6600 (3) Real Estate Principles

Studies methods of analyzing real estate opportunities, local government controls and regulations of the development process. Majority of class material is provided via case studies and guest lecturers. Last portion of the course will be the presentation of student group projects.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Real Estate

MBAX 6610 (3) Real Estate Finance and Investment Analysis

Objectives of the course are to 1) conduct income property investment analysis; 2) to develop the technical competence necessary to structure real estate transactions; and 3) to understand the financial assets securitized by real estate. Students will analyze income properties using Excel and ARGUS-DCR. Techniques for structuring real estate transactions examined in this course include lender participations, sale-leasebacks, joint ventures, and real estate syndications.

Requisites: Requires prerequisite course of MBAX 6600 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Real Estate

MBAX 6620 (3) Real Estate Project Competition

Examines real estate market behavior beginning with an overview of residential and commercial property markets. Examines various theories of land price determination and uses these models to understand how the private market allocates land to competing residential, office, retail, industrial/warehouse, hotel and other end users. Examines how factors influencing the demand for real estate interact with the factors influencing the supply of real estate to determine market rents and how the flow of future expected income is capitalized to yield the market price of property. The course will also examine the roles that local, state and federal governments have in real estate market outcomes.

Requisites: Requires prerequisite courses of MBAX 6600, 6610 and 6640 (all minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Real Estate

MBAX 6630 (3) Real Estate Economics

Examines real estate market operations and discusses alternative methodologies for estimating real estate values. Examines various theories of land price determination and uses these models to understand how the private market allocates land to competing residential, office, retail, industrial/warehouse, hotel, and other end users. Examines how factors influencing the demand for real estate interact with the supply of real estate to determine market rents and how the flow of future expected income is capitalized to yield the market price of the asset.

Requisites: Requires prerequisite courses of MBAC 6011 and 6060 (all minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Real Estate

MBAX 6640 (3) Real Estate Law and Practice

Examines the legal issues associated with developing, acquiring, transferring, and leasing real property. Topics include real estate contracts, land use and development agreements, vehicles for owning real estate, real estate covenants, conditions and restrictions, loan transactions, negotiating real estate contracts, commercial leases and real estate taxation. Material for this course will consist of assigned articles and real estate cases. Formerly MBAX 6855.

Requisites: Requires prerequisite course of MBAX 6600 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Real Estate

MBAX 6700 (3) Corporate Financial Reporting

Provides an in-depth study of the concepts underlying contemporary financial accounting practice. Includes preparation and analysis of financial statements and the application of concepts to selected current issues.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6220

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Accounting

MBAX 6710 (3) Financial Statement Analysis

Focuses on the use of accounting information by decision makers external to the firm. Considers judgments made by security analysts, bank lending officers and auditors. Emphasizes credit scoring, risk analysis and equity valuation.

Equivalent - Duplicate Degree Credit Not Granted: ACCT 6250

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Accounting

MBAX 6760 (3) Accounting for Managers

Explores cost management, especially as related to organizational decision making, planning, and control. Emphasizes case analysis and applications.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Accounting

MBAX 6761 (2) Managerial Accounting, Planning and Control

Introduces managerial accounting, which includes the concepts, models, and systems that provide this information and control. The course will familiarize participants with the terminology and basic concepts of managerial accounting, touching on topics ranging from development and use of cost information for decision-making to management control systems.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Accounting

MBAX 6801 (3) Global Perspectives Seminar

Provides students with an in-depth perspective about a specific country or region outside the United States. The course can focus on a different region or country each time it is offered. If demand for this type of experience is strong, multiple sections of the course could be offered in a given semester, each focusing on

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6802 (3) Pricing Strategy and Tactics

Pricing provides the means to capture value. The course covers theories, analytical tools and conceptual frameworks needed for devising price strategy as part of the value proposition for products and services. It draws upon principles from economics, marketing and psychology. Primary and secondary data based analysis is used to understand price response and competitive pricing. Substantive topics include customized pricing, price negotiations, bidding and auctions, price discounting, trade promotion, bundling, behavioral pricing, among others.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-).

Restricted to MBAD, DMBA, JMBA, PMBA, SCMN or BUAN majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6803 (3) Microfinance

Links financial markets with entrepreneurship to create a platform for the poor to start their own business. Participants learn how to combine technical knowledge of finance and international business development with the socially and ethically important microfinance field to help with sustainable economic development and reduce poverty worldwide, including the United States.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Finance

MBAX 6804 (3) Leading Effectively in Today's Environment

Explores a set of concepts, models and tools that you can use to lead and manage effectively in today's environment. Covers three key topics: leading change, building success through people, working effectively in a global environment. Provides better understanding of challenges managers face when leading change.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6806 (2) Global Perspectives

Contrasting operations in US and China will study what changes US companies have made to successfully operate in the Chinese market and how US companies have influenced Chinese business operations. Reviews the history and present state of the interdependency between the US and Chinese business environments. Culminates in a 9-day trip to China.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

MBAX 6815 (3) Sustainable Real Estate

Explores techniques, processes, tools, and capabilities required to manage growth and land use change in the light of shifts beginning to transform the way we approach land use and real estate development.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Real Estate

MBAX 6841 (2) Decision Making for Managers

Covers both behavioral/psychological aspects and analytical approaches to making decisions with multiple objectives. The focus is learning to frame decisions that involve multiple stakeholders with multiple objectives and then learning the various techniques used to evaluate the choices. Influence diagrams, decision heuristics using spreadsheets, and decision trees will all be explored with user-friendly decision tree software.

Requisites: Requires prerequisite courses of MBAC 6011, MBAC 6020, MBAC 6031, MBAC 6060 and MBAC 6090 (all minimum grade D-). Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6843 (3) Supply Chain and Operations Analytics

Analyzes key issues related to the design and management of operations and supply chains using quantitative tools such as linear, integer, and non-linear programming, regression, and statistical analysis. Covers important topics such as forecasting, aggregate planning, inventory theory, transportation, risk pooling, production control and scheduling, and facilities location, among others. Uses mathematical modeling, spreadsheet analysis, case studies, and pedagogical simulations to deliver material.

Requisites: Requires prereq courses of MBAC 6031 and 6080 (all min grade D-). Restricted to Master of Busn Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) Professional MBA Prog (PMBA), Supply Chain Mgmt (SCMN) or Busn Analytics majors only

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Operations and Production Management

MBAX 6844 (2) Operations Management

Producing a quality product or delivering a quality service is a fundamental task for any company or organization. Managing the transformation of inputs (raw materials, labor, capital) into outputs (goods and services) falls under the heading of Operations Management. In most organizations, operations comprise 80 percent of the costs, 80 percent of the personnel, 80 percent of the capital employed –the effective and efficient use of these resources is consequently central to the success of the firm. This course is about using operations to compete and win sustainable competitive advantage in your marketplace.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Management

MBAX 6846 (2) Global Strategy

The ability to compete effectively globally is increasingly important for many firms. Topics such as globalization and the competitive environment; key differences in institutions around the globe and their implications; how firms can succeed internationally (e.g., different entry strategies, how to manage across country borders, the firm's broader responsibility in the global community) will be discussed.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6847 (2) Emerging Markets in Global Business

Provides tools to analyze and understand emerging markets, how to operate in these markets and how to work with the multinational enterprises present in those areas. Offers a managerial perspective based on a thorough understanding of the relevance and impact of world events on global business. Promotes understanding of how to operate in emerging markets whether in the U.S. or abroad.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Entrepreneurship

MBAX 6885 (3) Interpreting the Economic Environment

The macroeconomic environment is vitally important to business managers regardless of their area of focus. Most macroeconomic events portend future economic changes that influence business and/or industry. Develops a basic understanding of the macroeconomy and its relationship to an individual business or industry through understanding macroeconomic concepts and data sources, developing a basic model, understanding relevant policy instruments, and integrating this information into the global economy.

Requisites: Requires prerequisite courses of MBAC 6060 and 6090 (all minimum grade C). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Finance

MBAX 6966 (1-3) Independent Study-Real Estate

Independent study in the field of real estate.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Real Estate

MBA Core (MBAC)

Courses

MBAC 6000 (3) Socially Responsible Enterprise

Prepares future managers for confronting the truly difficult situations that arise when deploying economic resources, altering the physical environment, and making decisions that affect the lives of investors, employees, community members and other stakeholders. Case-based challenges will be examined in a broad range of contexts, and essential ethical concepts will be explored by drawing on theories from ethics, sociology, economics, political science and philosophy.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6010 (3) Managerial Economics

Studies the elements of the business firm's fundamental problem—how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate-level microeconomics. Analyzes various applications and misapplications of relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6011 (1.5) Managerial Economics 1

Studies the elements of the business firm's fundamental problem—how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate-level microeconomics. Analyzes various applications and misapplications of the relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6012 (1.5) Managerial Economics 2

See MBAC 6011.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6020 (3) Financial Accounting

Introduces the financial reporting system used by business organizations to convey information about their economic affairs. Develops an understanding of financial reports and what they tell about a business enterprise. Focuses on how alternative accounting measurement rules represent different economic events in financial reports.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6030 (3) Quantitative Methods

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate-level treatment of descriptive statistics, probability, probability distributions, sampling theory and sampling distributions, and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers, and nonparametric methods.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6031 (1.5) Quantitative Methods

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate-level treatment of descriptive statistics, probability, probability distributions, sampling theory, sampling distributions, and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers and nonparametric methods.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6050 (3) Strategy

Analyzes how firms can attain and sustain competitive advantage in today's competitive environment. Focuses on industry dynamics, competitive positioning, firm capabilities, and corporate innovation. Introduces a set of tools for assisting managers in solving complex, real-world business problems in strategy development. Integrates MBA learning in functional areas, and emphasizes the fit between competitive analysis and the role of management and organization.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6052 (3) Capstone Projects

Provides students with an opportunity to focus on a specific project which would have a positive strategic impact on the company for which they work. For those who have entrepreneurial aspirations, this project could result in a business plan for a new venture. Final deliverable should address marketing, financial, operational, and management implications and strategic impact.

Requisites: Restricted to Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6060 (3) Corporate Finance

Analyzes the implications of modern finance theory for the major decisions faced by corporate financial managers. Develops the basic skills necessary to apply financial concepts to the various problems faced by a firm. Includes capital budgeting, capital structure, long term financing, short term financial management, and financial planning topics.

Requisites: Requires prerequisite course of MBAC 6020 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6080 (3) Decision Modeling and Applications

Integrates topics from decision analysis and operations management as they relate to modeling management decisions. Field projects involve the university, local companies, and/or government agencies.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6090 (3) Marketing Management

Provides a solid foundation of marketing knowledge by focusing on principles of marketing. Introduces the role that marketing cases play in advancing understanding and skill development in the field of marketing. Case discussions illustrate concepts discussed, and case studies are used to introduce the marketing decision making process. Emphasizes the international nature of marketing, as well as the importance of analysis and the understanding of the economic, demographic, political-legal-regulatory, sociocultural, technological, and natural environments.

Requisites: Requires prerequisite course of MBAC 6030 (minimum grade D-). Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6098 (1) Professional Development I

Professional Development I and II will introduce students to a range of skills to help them be successful in the professional work environment, including presentation development, constructive feedback loops, and personal presentation in team-based sessions. It will also offer a survey of the career management process and provide students with the tools and life-long skills to execute a strategic career management plan.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: MBA: Core Courses

MBAC 6099 (1.5) Professional Development II

Professional Development I and II will introduce students to a range of skills to help them be successful in the professional work environment, including presentation development, constructive feedback loops, and personal presentation in team-based sessions. It will also offer a survey of the career management process and provide students with the tools and life-long skills to execute a strategic career management plan.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: MBA: Core Courses

Mechanical Engineering (MCEN) Courses

MCEN 1024 (4) Chemistry for Energy and Materials Science

Covers the basic physical and chemical fundamentals underlying the disciplines of energy and materials, with a focus on topics relevant to your mechanical engineering education. These fundamentals include atomic structure, stoichiometry, the periodic table, chemical bonding, states of matter, thermochemistry, and chemical reactions. Department enforced prerequisite: one year of high school chemistry.

Requisites: Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 1025 (4) Computer-Aided Design and Fabrication

Introduces CAD software and relevant concepts, including orthographic projection, sections, engineering drawing, geometric dimensioning and tolerancing, and an introduction to manufacturing methods. Final design project involves rapid prototyping.

Requisites: Restricted to Mechanical Engineering (MCEN) or Engineering Physics (EPEN) majors only.

Additional Information: Departmental Category: Design

MCEN 1208 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest. Credit to be arranged.

Requisites: Restricted to students with 0-26 units (Freshmen) Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Special Topics

MCEN 2000 (1) Mechanical Engineering as a Profession

Provides an introduction to the profession of mechanical engineering. Specific topics addressed include career opportunities in mechanical engineering, internship search skills, expectations for professional behavior in the classroom and in industry and current events/ethics topics relevant to the field. Course format may include additional evening/weekend activities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Mechanical Engineering (MCEN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 2023 (3) Statics and Structures

Covers statics of particles, equivalent force systems, rigid bodies, equilibrium of rigid bodies in two and three dimensions, analysis of truss and frame structures, uniaxially-loaded members, distributed force systems and friction.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 2121 or GEEN 2851

Requisites: Requires prereq course of APPM 1360 or MATH 2300 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engineering Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Solids

MCEN 2024 (3) Materials Science

Provides an overview of the structure, properties and processing of metallic, polymeric and ceramic materials. Specific topics include perfect and imperfect solids, phase equilibria, transformation kinetics, mechanical behavior and material degradation. Approach incorporates both materials science and materials engineering components.

Requisites: Requires prereq course of MCEN 1024 or CHEN 1211 and CHEM 1221 or CHEM 1113 and 1114, and PHYS 1110 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Materials

MCEN 2043 (3) Dynamics

Covers dynamic behavior of particle systems and rigid bodies; 2-D and 3-D kinematics and kinetics; impulse, momentum, potential, and kinetic energy; and work, collision, and vibration.

Requisites: Requires prerequisite courses of MCEN 2023 or CVEN 2121 or GEEN 2851 (minimum grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Solids

MCEN 2063 (3) Mechanics of Solids

Covers shear force and bending moment, torsion, stresses in beams, deflection of beams, matrix analysis of frame structures, analysis of stress and strain in 2-D and 3-D (field equations, transformations), energy methods, stress concentrations and columns.

Equivalent - Duplicate Degree Credit Not Granted: CVEN 3161

Requisites: Requires prereq courses of MCEN 2023 or CVEN 2121 or GEEN 2851 (min grade C). Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Solids

MCEN 3012 (3) Thermodynamics

Explores fundamental concepts and basic theory, including first and second laws of thermodynamics, properties, states, thermodynamic functions and cycles.

Equivalent - Duplicate Degree Credit Not Granted: GEEN 3852

Requisites: Requires prereq course of APPM 2350 or MATH 2400 (minimum grade C). Restricted to students with 27-180 credits (Soph, Jrs or Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Thermal

MCEN 3017 (3) Circuits and Electronics

Introductory course covers analysis of electric circuits by use of Ohm's law, network reduction, node and loop analysis, Thevenin's and Norton's theorems, DC and AC signals, transient response of simple circuits, transfer functions, basic diode and transistor circuits and operational amplifiers.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 3010

Requisites: Requires prerequisite courses of APPM 2360 and PHYS 1140 (all minimum grade C). Restricted to students in the MSC/CU-Boulder Mechanical Engineering Partnership Program only.

Additional Information: Departmental Category: Miscellaneous

MCEN 3021 (3) Fluid Mechanics

Examines fundamentals of fluid flow with application to engineering problems. Topics covered include fluid statics and kinematics, Bernoulli equations, laminar and turbulent viscous boundary layers, laminar and turbulent pipe flow, and conservation equations for mass, momentum and energy.

Equivalent - Duplicate Degree Credit Not Granted: CHEN 3200 and CVEN 3313 and GEEN 3853

Requisites: Requires prereq course of MCEN 2023 or CVEN 2121 or GEEN 2851 (min grade C). Requires prereq or coreq course APPM 2360. Restricted to students with 27-180 credits (Soph/Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Fluids

MCEN 3022 (3) Heat Transfer

Studies fundamentals of heat transfer by conduction, convection, and radiation. Emphasizes problem formulation and selection of appropriate solution techniques. Provides applications to modern engineering systems, which may include energy, biological, environmental, and materials engineering problems.

Requisites: Requires prereq courses of MCEN 3021 and MCEN 3012 or GEEN 3852 and APPM 2360 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Thermal

MCEN 3025 (3) Component Design

Application of mechanics and materials science to the detailed design of various machine elements including shafts, bearings, gears, brakes, springs, and fasteners. Emphasizes application and open-ended design problems.

Requisites: Requires prerequisite courses of MCEN 1025 and MCEN 2063 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical (MCEN) or Environmental (EVEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Design

MCEN 3030 (3) Computational Methods

Studies fundamental numerical techniques for the solution of commonly encountered engineering problems. Includes methods for linear and nonlinear algebraic equations, data analysis, numerical differentiation and integration, ordinary and partial differential equations.

Requisites: Requires prerequisite courses of APPM 2360 and CHEN 1310 or CSCI 1300 or CSCI 1310 or CSCI 1320 (all minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Math

MCEN 3032 (3) Thermodynamics 2

Offers advanced topics and applications for thermal system design and analysis. Topics include thermodynamics of state, entropy, thermodynamic cycles and reacting and nonreacting mixtures. Provides application to power generation, refrigeration and HVAC with conventional and advanced technologies. Most assignments are design oriented.

Requisites: Requires prerequisite courses of MCEN 3021 and MCEN 3012 or GEEN 3852 and APPM 2360 (all minimum grade C). Restricted to students with 57-180 credits (Junior/Senior) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Thermal

MCEN 3047 (4) Data Analysis and Experimental Methods

Learn to plan and carry out experiments and analyze the results. Topics covered include measurement fundamentals, design of experiments, elementary statistics and uncertainty analysis. Topics in statistics include probability, error propagation, confidence intervals, hypothesis testing, linear regression, one- and two-factor ANOVA and time series analysis. Formerly MCEN 3037.

Requisites: Prereq APPM 2360 PHYS 1140 MCEN 2024 2063 a prereq or coreq ECEN 3010 or MCEN 3017 MCEN 3030 WRTG 3030 or 3035 or HUEN 1010 or 3100 (min grade C). Restricted to 57-180 credits MCEN or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Miscellaneous

MCEN 3208 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Requires prereq courses of APPM 2360 PHYS 1140 and prereq or coreq courses of ECEN 3010 and WRTG 3030 or WRTG 3035 or HUEN 1010 or 3100 (all min grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Special Topics

MCEN 3930 (6) Mechanical Engineering Cooperative Education

Students enrolled in this course participate in a previously arranged, department-sponsored education program with a university, government agency, or industry. This course is offered only through Continuing Education. 00 GPA or higher.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: At least a 2.75 cumulative GPA is required. Restricted to Mechanical Engineering or students with a plan of Mechanical Engineering Concurrent Degree or General Engineering Plus students with a MCEN subplan.

Recommended: Prerequisite 3.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Math

MCEN 4026 (3) Manufacturing Processes and Systems

Examines manufacturing processes for metals, polymers, and composites as well as manufacturing systems that integrate these processes. Lecture topics include forming, machining, joining, assembling, process integration, computer-aided manufacturing, and manufacturing system engineering.

Requisites: Requires prerequisite course of MCEN 2024 (minimum grade C). Restricted to students with 57-180 credits (Jrs/Srs) Mechanical Engineering majors only.

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 4032 (3) Sustainable Energy

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5032

Requisites: Requires prerequisite course of MCEN 3012 and MCEN 3022 (minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Thermal

MCEN 4037 (2) Measurements Lab

Conduct experiments designed to introduce methods of experimentation and data analysis. Experiments taken from solid mechanics, fluid mechanics, thermal science and materials science. Emphasizes planning an experiment, applying sound scientific procedures, keeping proper records and communicating results orally and in written reports. Projects extend over two or more weeks.

Requisites: Requires prereq of MCEN 2063 3047 WRTG 3030 or 3035 or HUEN 1010 or 3100 (all min. grade C). Restricted to students with 57-180 credits (Jrs/Srs) MECH or EVEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Miscellaneous

MCEN 4043 (3) System Dynamics

Covers linear dynamic systems and mathematical tools for understanding them, input-output relationships, modeling templates, complex variables, Laplace transform, time-harmonic forcing and response, Fourier series and discrete Fourier transform, and coupled systems.

Requisites: Requires prereq courses of MCEN 2043 ECEN 3010 or MCEN 3017 APPM 2360 (min grade C) a prereq or coreq course of MCEN 3030. Restricted to students with 57-180 credits (Jrs or Srs) MCEN or GEEN-BS students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Solids

MCEN 4045 (3) Mechanical Engineering Design Project 1

First part of a two-course capstone design experience in mechanical engineering. Covers problem definition, determining design requirements, alternative design concepts, engineering analysis, proof-of-concept prototype and CAD drawings. Students make several oral design reviews, a final design presentation, and prepare a written report.

Requisites: Requires prereq of MCEN 2000,3022,3025 GEEN 1400 or 2400 or 3400 or COEN 1400 or ECEN 1400 (all min grade C). Prereq/coreq of MCEN 3047,4026,4043. Restricted to students with 87-180 units, MCEN or GEEN-BS students, with a sub-plan of MEC.

Additional Information: Departmental Category: Design

MCEN 4047 (2) Measurements 2

Emphasizes experiment planning, applying sound experimental procedures, using statistics, keeping proper records, and communicating results orally, visually, and through written reports. Projects extend over several weeks and relate to solid mechanics, acoustics, electronics, and/or other ME-related disciplines.

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 4037 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 4057 (3) Environmental Modeling

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5057

Requisites: Requires prerequisite courses of CHEN 1211 or CHEM 1113 or MCEN 1024 and CSCI 1300 or CSCI 1320 (all minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 4085 (3-4) Mechanical Engineering Design Project 2

Second part of a two-course capstone design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product.

Requisites: Requires prereq courses of MCEN 4026, 4043 and 4045 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering (MCEN) or General Engr Plus (GEEN-BS) students, with a sub-plan of Mechanical (MEC).

Additional Information: Departmental Category: Design

MCEN 4086 (1) Writing for Design Projects

Communicate professionally in writing to the technical and nontechnical audience. Develop skills to analyze rhetorical situations and compose documents, such as reports, technical manuals and user guides, that achieve a specific purpose and meet the needs of a particular audience. Writing with clarity, conciseness and correctness will be emphasized.

Requisites: Requires enrollment in corequisite course of MCEN 4085.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 4115 (3-4) Mechatronics and Robotics I

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5115

Requisites: Requires prerequisite courses of ECEN 3010 or 2250 and ECEN 1310 (formerly GEEN 1300/COEN 1300) or CSCI 1300 or 1310 or 1320 (all min grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Design

MCEN 4117 (3) Anatomy and Physiology for Engineers

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5117

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 4123 (3) Vibration Analysis

Highlights free and forced vibration of discrete and continuous systems. Examines Lagrange's equation, Fourier series, Laplace transforms, and matrix and computational methods. Applies knowledge to practical engineering problems.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 4123

Requisites: Requires prerequisite course of MCEN 3030 or ASEN 3112 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Solids

MCEN 4124 (3) Mechanical Behavior of Materials

Addresses the relationship between material structure and the fundamental processes of deformation, yield, and fracture. Examines elements of elasticity theory, introduction to plasticity, and formulation of failure criteria. Studies basic deformation processes in terms of dislocation mechanics and macroscopic mechanical behavior. Takes into consideration the influence of compositional and processing strengthening mechanisms on mechanical properties.

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Materials

MCEN 4125 (3) Optimal Design

Applies linear and nonlinear optimization methods to the design of mechanical components and systems. Examines unconstrained and constrained optimizations as well as formulation of objective functions, including cost, weight, response time and deflection. Applies knowledge to gears, springs, cams and linkages.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5125

Requisites: Requires prerequisite courses of MCEN 3025 and MCEN 3030 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Design

MCEN 4127 (3) Biomedical Ultrasound

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5127

Requisites: Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 4131 (3) Air Pollution Control Engineering

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5131

Requisites: Requires prerequisite courses of MCEN 3012 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Fluids

MCEN 4133 (3) Biomechanics

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5133

Requisites: Requires prerequisite courses of MCEN 2024, MCEN 2063 and MCEN 3021 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Materials

MCEN 4135 (3) Wind Energy and Wind Turbine Design

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turning and determining whether their proposal is feasible from an economic standpoint.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5135

Requisites: Requires prerequisite courses of MCEN 3021 and ECEN 3010 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical or Environmental Engineering majors only.

Additional Information: Departmental Category: Design

MCEN 4137 (3) Anatomy and Physiology 2

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5137

Requisites: Requires prerequisite course of MCEN 4117 (minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 4141 (3) Indoor Air Pollution

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5141

Requisites: Requires prerequisite courses of MCEN 3021 and MCEN 3022 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Fluids

MCEN 4151 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5151 and FILM 4200 and ARTF 5200

Requisites: Requires prerequisite course of MCEN 3021 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Fluids

MCEN 4152 (3) Introduction to Combustion

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5152

Requisites: Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Recommended: Prerequisites MCEN 3021 and MCEN 3022.

Additional Information: Departmental Category: Thermal

MCEN 4154 (3) Biocolloids and Biomembranes

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5154

Requisites: Requires prerequisite courses of APPM 2360 and PHYS 1120 (all minimum grade C). Restricted to students with 57-180 credits (juniors/seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 4162 (3) Energy Conversion

Examines common energy-conversion methods and devices. Topics include power-cycle thermodynamics, turbocompressor and expander processes, combustion systems, and applications and limitations of direct energy-conversion systems.

Requisites: Requires prerequisite course of MCEN 3012 (minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Thermal

MCEN 4173 (3) Finite Element Analysis

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5173

Requisites: Requires prerequisite courses of MCEN 2023 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Solids

MCEN 4174 (3) Failure of Engineering Materials

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5174

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Materials

MCEN 4183 (3) Mechanics of Composite Materials

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5183

Requisites: Requires prerequisite courses of MCEN 2024 and MCEN 2063 (all minimum grade C). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Solids

MCEN 4194 (3) Electrochemical Energy Conversion and Storage

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5194

Requisites: Requires prereq courses of MCEN 2024 and 3032 (all min grade C). Restricted to graduate students or to students with 87-180 credits (Seniors) in the College of Engineering and Applied Science or to Mech Engr Concurrent Degree students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 4228 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 5228

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 4848 (1-6) Independent Study

Subjects arranged in consultation with instructor and undergraduate advisor. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Mechanical Engineering majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 5020 (3) Methods of Engineering Analysis 1

Studies selected topics from linear algebra, ordinary differential equations, and Fourier series. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Math

MCEN 5021 (3) Introduction to Fluid Dynamics

Focuses on physical properties of gases and liquids, and kinematics of flow fields. Analyzes stress; viscous, heat-conducting Newtonian fluids; and capillary effects and surface-tension-driven flow. Other topics include vorticity and circulation, ideal fluid flow theory in two and three dimensions, Schwartz-Christoffel transformations, free streamline theory, and internal and free-surface waves.

Requisites: Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5022 (3) Classical Thermodynamics

First and second laws of thermodynamics. Entropy and availability. Cycle analysis. Thermodynamic properties of pure substances and mixtures. Property relations. Chemical reactions and chemical availability. Energy systems analysis.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5023 (3) Solid Mechanics 1

Introduces stress, strain and motion of a continuous system. Discusses material derivative; fundamental laws of mass, momentum, energy and entropy; constitutive equations and applications to elastic and plastic materials.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 5012

Requisites: Requires coreq course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Solids

MCEN 5024 (3) Materials Chemistry and Structures

Provides graduate level students with a comprehensive overview of the chemistry and structure of material systems, with a focus on chemical bonding, the resulting material structures and their properties. This course is intended to become one of the four core courses offered in the new Materials Science curriculum. Course topics include: bonding in solids, crystalline and amorphous states, basic group theory, diffraction, metals and alloys, ceramics, and an intro to mat. characterization.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Materials

MCEN 5027 (1) Graduate Seminar

Offers weekly presentations by visiting speakers, faculty, and students.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

MCEN 5032 (3) Sustainable Energy

Examines sustainability of our current energy systems, including transportation, using environmental and economic indicators. Uses systems analysis that addresses energy supply and demand. Explores the science and technology as well as environmental and economic feasibility of efficiency measures and renewable energy technologies. Additional emphasis is given to the global nature of the challenges and the potential for locally optimal solutions.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4032

Grading Basis: Letter Grade

Additional Information: Departmental Category: Thermal

MCEN 5034 (3) Thermodynamics of Materials

Provides a unified presentation of fundamental concepts applicable to the thermodynamics of engineering materials. Develops quantitative tools for understanding the physical principles that govern phase equilibrium and transformation. Generates binary and ternary phase diagrams and determine the resulting materials structures and corresponding physical and mechanical properties.

Recommended: Prerequisites MCEN 2024 and MCEN 3012.

Additional Information: Departmental Category: Materials

MCEN 5040 (3) Methods of Engineering Analysis 2

Studies selected topics from the theory of complex variables, integral transform methods, partial differential equations, and variational methods. Assigns computer exercises. Correlates with analysis topics in other mechanical engineering graduate courses, and emphasizes applications.

Requisites: Requires prerequisite course of MCEN 5020 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Math

MCEN 5041 (3) Advanced Fluid Mechanics 1

Highlights exact solution of Navier-Stokes equations and fundamentals of rotating fluids. Considers Low Reynolds number flow; similarity solutions; viscous boundary layers, jets, and wakes; and unsteady viscous flow.

Requisites: Requires corequisite course of MCEN 5020. Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5042 (3) Heat Transfer

Studies development of equations governing transport of heat by conduction, convection, and radiation, and their solution. Includes analytical and numerical solution of initial and boundary value problems representative of heat conduction in solids. Describes heat transfer in free and forced convection, including laminar and turbulent flow. Also involves radiation properties of solids, liquids, and gases and transport of heat by radiation.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5044 (3) Mechanical Behavior of Materials

This introductory-level graduate course incorporates relevant aspects of materials science, solid mechanics, thermodynamics and mathematics, and applies them to achieve a fundamental understanding of the mechanical behavior of crystalline and non-crystalline engineering materials.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Materials

MCEN 5045 (3) Design for Manufacturability

Topics include general design guidelines for manufacturability; aspects of manufacturing processes that affect design decisions; design rules to maximize manufacturability; statistical considerations; value engineering and design for assembly (manual, robotic, and automatic). Presents case studies of successful products exhibiting Dfm.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering (MCEN) majors only.

Additional Information: Departmental Category: Materials

MCEN 5055 (3) Advanced Product Design

Introduces engineering design and development of consumer products. Includes learning sketching, brainstorming, idea generation, design thinking, user-centered design, product requirements and specifications, product constraints, human factors, aesthetics, industrial design, intellectual property, concept prototyping, idea selection, tolerancing, cost estimating, design for assembly, and materials selection. Entails a semester-long team re-design of a consumer product.

Additional Information: Departmental Category: Design

MCEN 5057 (3) Environmental Modeling

Enables students to develop and evaluate pollutant transport, fate, exposure, and risk models for air, water, and multi-media systems, with a special emphasis on air. Emphasizes the fundamental physics and chemistry that govern contaminant fate and transport and the basic mathematical equations and numerical approaches for describing these processes.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4057

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 5065 (3) Graduate Design I

First part of a two-course graduate product design experience in mechanical engineering. Covers problem definition and specifications, determining design requirements, user feedback, alternative design concepts, engineering analysis, concept prototypes, and CAD drawings. Students make several oral design reviews, a final design presentation, and prepare a written report. Entails a team product design, fabrication, and testing cycle of sponsored project.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Design

MCEN 5075 (3) Graduate Design II

Second part of two-course graduate product design experience in mechanical engineering. Includes refinement of prototype, design optimization, fabrication, testing, and evaluation. Students orally present the final design and prepare a written report and operation manual for the product. Entails a team product design, fabrication, and testing cycle of a sponsored project, leading to a fully-functional product.

Requisites: Requires prerequisite course of MCEN 5065 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Design

MCEN 5115 (3) Mechatronics and Robotics I

Focuses on design and construction of microprocessor-controlled electro-mechanical systems. Lectures review critical circuit topics, introduce microprocessor architecture and programming, discuss sensor and actuator component selection, robotic systems and design strategies for complex, multi-system devices. Lab work reinforces lectures and allows hands-on experience with robotic design. Students must design and build an autonomous robotic device. Project expenses may be incurred (\$50 maximum).

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4115

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Design

MCEN 5117 (3) Anatomy and Physiology for Engineers

Explores human physiological function from an engineering, specifically mechanical engineering, viewpoint. Provides an introduction to human anatomy and physiology with a focus on learning fundamental concepts and applying engineering (mass transfer, fluid dynamics, mechanics, modeling) analysis.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4117

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Miscellaneous

MCEN 5121 (3) Compressible Flow

Applies energy, continuity, and momentum principles to compressible flow. Topics include normal and oblique shocks; Prandtl-Meyer expansion; methods of characteristics; and one-, two-, and three-dimensional subsonic, supersonic, and hypersonic flows.

Requisites: Requires prerequisite course of MCEN 5021 (minimum grade D-). Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5122 (3) Statistical Thermodynamics

Axiomatic formulation of macroscopic thermodynamics. Quantum mechanical description of atomic and molecular structure. Statistical mechanics description of thermodynamic properties of gases, liquids and solids. Elementary kinetic theory of gases and evaluation of transport properties. Department enforced requisite: undergraduate thermodynamics.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5125 (3) Optimal Design

Applies linear and nonlinear optimization methods to the design of mechanical components and systems. Examines unconstrained and constrained optimizations as well as formulation of objective functions, including cost, weight, response time and deflection. Applies knowledge to gears, springs, cams and linkages.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4125

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Design

MCEN 5127 (3) Biomedical Ultrasound

Covers the design of ultrasound systems for medical imaging and therapy, including the physics of wave propagation, transducers, acoustic lenses, pulse-echo imaging and cavitation dynamics, with an emphasis on current topics in biomedical ultrasound. Includes lectures on theory, practice and special topics; a laboratory on wave propagation; oral presentations on current literature; and a design project.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4127

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 5131 (3) Air Pollution Control Engineering

Introduces air quality regulations, meteorology and modeling. Examines methods for controlling major classes of air pollutants, including particulate matter and oxides of sulfur and nitrogen, as well as control technology for industrial sources and motor vehicles. Requires interdisciplinary design projects.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4131

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5133 (3) Biomechanics

Focuses on developing an understanding of the fundamental mechanical principles that govern the response of hard and soft biological tissue to mechanical loading. Specifically, covers mechanical behavior of biological materials/tissues, classical biomechanics problems in various tissues, the relationship between molecular, cellular and physiological processes and tissue biomechanics and critical analysis of related journal articles.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4133

Additional Information: Departmental Category: Materials

MCEN 5135 (3) Wind Energy and Wind Turbine Design

Focuses on understanding and applying principles related to current wind energy technology. Students will apply technical coursework from throughout the ME curriculum (fluids, dynamics, circuits, economics) to the process of designing a wind turbine and determining whether their proposal is feasible from an economic standpoint.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4135

Requisites: Restricted to Mechanical (MCEN), Civil (CVEN) or Aerospace (ASEN) Engineering graduate students only.

Additional Information: Departmental Category: Design

MCEN 5137 (3) Anatomy and Physiology 2

Provides in-depth understandings of anatomy and physiology as well as introductions to transport phenomena, flow mechanics and solid mechanics in several organ systems: the cardiovascular, pulmonary, kidney, endocrine and digestive systems. Introduces artificial physiological systems to replace or assist physiological functions and introduce the concepts of physiological barriers that prevent diagnosis or effective therapeutics.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4137

Grading Basis: Letter Grade

Additional Information: Departmental Category: Miscellaneous

MCEN 5141 (3) Indoor Air Pollution

Describes the impact of indoor air pollutants on human health, including an introduction to key pollutants and their sources. Students will estimate emission factors, calculate generation/ventilation rates, quantify the impact of deposition and chemical reactions and explore relevant control technology. Current issues will also be addressed, including climate change, green building design, economic concerns and relevance to the developing world.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4141

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 5151 (3) Flow Visualization

Explores techniques for the visualization of the physics of fluid flows including seeding with dyes, particles and bubbles, and shadowgraphy and schlieren. Reviews optics and fluid physics, especially atmospheric clouds. Assignments are student-driven, to individuals and mixed teams of graduates, undergraduates, engineering majors and photography/video majors.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4151 and FILM 4200 and ARTF 5200

Additional Information: Departmental Category: Fluids

MCEN 5152 (3) Introduction to Combustion

Focuses on the mechanisms by which fuel and oxidizers are converted into combustion products. Application to practical combustion devices such as Otto, Diesel, gas turbine and power plant combustion systems. Consideration of combustion-generated air pollution, fire safety and combustion efficiency.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4152

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Thermal

MCEN 5154 (3) Biocolloids and Biomembranes

Covers the thermodynamics and mechanics of biological membranes and biomedical colloids. Considers intermolecular and surface forces, self-assembly and colloidal stability. Addresses structure-property relationships and design principles for biomedical applications. Focuses on monolayers, bilayers, micelles, filomicelles, liposomes, polymersomes, emulsions, microbubbles, polyplexes and polyelectrolyte multilayer capsules.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4154

Recommended: Prerequisites APPM 2360 and PHYS 1120.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 5161 (3) Aerosols

Introduces atmospheric aerosols and properties of their distributions, followed by fundamental descriptions of single particle dynamics, thermodynamics, nucleation, coagulation, mass transfer and populations dynamics. During the second half of the course, the focus will shift to sources and sinks of atmospheric aerosols, their impacts on atmospheric chemistry and radiation, and the impacts of these processes on air quality and climate.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Fluids

MCEN 5173 (3) Finite Element Analysis

Introduces the theory behind and applications of the finite element method as a general and powerful tool to model a variety of phenomena in mechanical engineering. Applications include structural mechanics, mechanics of elastic continua and heat conduction.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4173

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Solids

MCEN 5174 (3) Failure of Engineering Materials

Examines the fundamental concepts regarding the failure of engineering materials. Case studies are used to integrate a basic understanding of material failure mechanisms with analysis techniques and tools. Topics include the elastic properties (isotropic and anisotropic materials) and the origin of elastic behavior, viscoelasticity, plasticity (dislocation mechanisms, yielding criteria, strengthening mechanisms), creep, fracture and fatigue.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4174

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Materials

MCEN 5183 (3) Mechanics of Composite Materials

Introduces various kinds of composite materials, composite fabrication techniques, the physical and mechanical behavior of composites, and analytical and experimental methodologies.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4183

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Solids

MCEN 5194 (3) Electrochemical Energy Conversion and Storage

Presents the fundamentals, principles and experimental techniques of electrochemistry, the background of ionic or electronic conduction of metal, semiconductor, inorganic and polymer materials and applications in the areas of batteries, fuel cells, electrochemical double layer capacitors, electrochemical photonics, sensors and semiconductor electrochemistry.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4194

Recommended: Prerequisites MCEN 2024 and MCEN 3032.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Materials

MCEN 5208 (1-4) Special Topics

Credit hours and subject matter to be arranged.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Miscellaneous

MCEN 5228 (1-4) Special Topics in Mechanical Engineering

Subject matter to be selected from topics of current interest.

Equivalent - Duplicate Degree Credit Not Granted: MCEN 4228

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students in College of Engineering and Applied Science or to students with 57-180 credits (Junior or Senior) or Mechanical Engineering Concurrent Degree students.

Additional Information: Departmental Category: Miscellaneous

MCEN 5236 (3) Integ Mfg Sys

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 5255 (3) Design for Mfg

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Design

MCEN 5258 (1-3) Sp Tpcs-Combustion Seminar

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Special Topics

MCEN 5636 (3) Micro-Electro-Mechanical Systems 1

Addresses issues of micro-electro-mechanical systems (MEMS) modeling, design, and fabrication. Emphasizes the design and fabrication of sensors and actuators due to significance of these devices in optics, medical instruments, navigation components, communications, and robotics. Department consent required.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Manufacturing and Systems

MCEN 5832 (3) Special Topics

Additional Information: Departmental Category: Special Topics

MCEN 5848 (1-6) Independent Study

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student. May be repeated for up to 6 total credits.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Engineering graduate students only.

Additional Information: Departmental Category: Miscellaneous

MCEN 5858 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 5868 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 5878 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 5888 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6001 (3) Reacting Flows

Provides an introduction to reacting flows and combustion. Covers chemical kinetics, including global and detailed mechanisms and the variable density flow equations are derived. Relevant non-dimensional parameters and limiting behaviors are discussed. The Rankine-Hugoniot relations are presented and various aspects of diffusion, kinetically dominated and balanced combustion are outlined. Flame structures are discussed, including laminar and turbulent flames, and the Burke-Schumann solution is outlined. The turbulent forms of the motion equations are derived, and the reactive scalar transport equation and mixture fraction variable are presented. The flamelet progress variable approach is outlined, including a comparison of steady and unsteady flamelet models. Specific topics in spray combustion, triple flames, solid-gas reactors and detonations are discussed.

Equivalent - Duplicate Degree Credit Not Granted: ASEN 6001

Requisites: Requires prerequisite course of MCEN 5021 (minimum grade C-). Restricted to College of Engineering and Applied Science graduate students or BS/MS Concurrent Degree Students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Fluids

MCEN 6184 (3) Structure and Properties of Polymers

Emphasizes the relationship between molecular structure and macroscopic properties. Structural aspects include chain conformation, configuration, and the crystalline and amorphous states. Discusses physical and mechanical properties with a focus on solution and phase behavior, transitions of bulk polymers, and rubber and viscoelastic behavior. Requires background in basic material science and polymer related concepts.

Requisites: Restricted to College of Engineering graduate students only.

Additional Information: Departmental Category: Materials

MCEN 6228 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Special Topics

MCEN 6800 (3) Master of Engineering Project

Additional Information: Departmental Category: Math

MCEN 6848 (1-6) Independent Study

Available only through approval of graduate advisor. Subjects arranged to fit the needs of the particular student.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Miscellaneous

MCEN 6858 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6868 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6878 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6888 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Miscellaneous

MCEN 6949 (1) Master's Degree Candidacy

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Thesis

MCEN 6959 (1-6) Master's Thesis

Additional Information: Departmental Category: Thesis

MCEN 7221 (3) Turbulence

Hydrodynamic stability theory, equations for turbulent flows, free shear flows and boundary layers, homogeneous and isotropic turbulence, overview of turbulent combustion, reaction kinetics, energy equation, Favre averaging, Pdfs, premixed and nonpremixed flame modeling, and recent developments.

Requisites: Restricted to any College of Engineering and Applied Science graduate students or to Mechanical Engineering undergraduate majors only.

Additional Information: Departmental Category: Fluids

MCEN 7228 (3) Special Topics**Additional Information:** Departmental Category: Special Topics**MCEN 8999 (1-10) Doctoral Thesis****Additional Information:** Departmental Category: Thesis

Media Research and Practice (MDRP)

Courses

MDRP 6201 (3) Global Media and Culture

Explores the historical, cultural, social, political and economic dimensions of media systems in various parts of the world and their relationship with technological and cultural processes. Aims to provide a critical overview of the profound changes in media and culture in today's digitally connected/disconnected world. Formerly MDST 6201.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 6671 (3) Media, Myth, and Ritual**

Explores cultural practices of media audiences. Addresses theoretical and methodological implications of studying audiences from a culturalist perspective, with particular focus on media audience practices. Students engage in field research projects related to course content. Formerly MDST 6671.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 6871 (1-3) Special Topics**

Special topics. May be repeated up to 15 total credit hours

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 7001 (1) PhD Colloquium Series**

Introduce the new doctoral students to the Media Research and Practice program and its faculty members and their research. The colloquium series will also include workshops on program planning, publishing, attending conferences, writing a dissertation, preparing and presenting a job talk, etc.

Repeatable: Repeatable for up to 2.00 total credit hours. Allows multiple enrollment in term.**Grading Basis:** Pass/Fail**MDRP 7011 (3) Proseminar in Media Communication Theory 1**

Introduces the principal concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7011.

Requisites: Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD) only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7021 (3) Proseminar in Media and Communication Theory 2**

Continues the introduction of principle concepts, literature, and theoretical and paradigmatic perspectives of media studies and mass communication and their ties and contributions to parallel domains in the social sciences and humanities. Formerly MDST 7021.

Requisites: Requires prerequisite course of MDRP 7011 (minimum grade C-). Restricted to doctoral students in Media Studies (MDST), Journalism (JRNL) or Advertising, PR and Media Design (APRD).**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7051 (3) Qualitative Research Methods in Media**

Examines various methods of qualitative data gathering and analysis in the mass and social media context. Formerly CMCI 7051.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7061 (3) Quantitative Research Methods in Media**

Examines various methods of quantitative data gathering methods and analysis in the mass media context. Formerly CMCI 7061.

Requisites: Restricted to graduate students only.**Additional Information:** Departmental Category: Core Curriculum and General Electives**MDRP 7841 (1-6) Independent Study**

Independent study.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 7871 (3) Special Topics**

Special topics.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to graduate students only.**MDRP 8991 (1-10) Doctoral Dissertation**

Repeatable: Repeatable for up to 40.00 total credit hours.

Requisites: Restricted to graduate students only.

Media Studies (MDST)

Courses

MDST 1001 (3) Foundations of Media Studies

Introduces students to key issues and debates and contemporary applications of critical media studies focusing on economic, social, political and cultural implications. Provides an understanding of the relationship between theory and practice and equips students with the tools to critically analyze various forms of textual transmission.

Grading Basis: Letter Grade**MDST 1002 (3) Introduction to Social Media**

Introduces students to network structures and principles, the technology and infrastructures that allow them to flourish, and the cultures that grow up through and around them. Explores how social media enables community, how it assembles and empowers agents of change and how design informs individual and group behavior.

Grading Basis: Letter Grade

MDST 2001 (3) Global Media Literacy

Explores the expanding nature of literacy in a digital world and changes in the meanings and practices of literacy over time. Prepares students to access, analyze, evaluate, create and engage with media in a variety of forms. Acquire competencies in evolving multimedia environments by critically evaluating media messages.

MDST 2002 (3) Media and Communication History

Examines the historical development of communication forms, tools, technologies and institutions (orality, writing, printing, photography, film, radio, television, computers, internet); their influence on culture (forms of expression and social relationships); and their impact on social and individual experience. Applies knowledge of communication history to contemporary social issues and problems in media and society, domestically and internationally.

MDST 2010 (3) Media and Social Movements

Surveys the history and contemporary efforts of social activists to bring about democratic media reform and examines how media are used as tools for connecting and advancing social movements. Emphasis is given to media activism and social movements in the United States, as well as to similar and related transnational activism and movements.

Requisites: Requires a prerequisite course of MDST 1001 (minimum grade C-).

Grading Basis: Letter Grade

MDST 2011 (3) Disruptive Entrepreneurship in the Internet's New Economies

Grapples with the disruptive business models that drive the online economy: both the dominant ones and the alternatives vying to transform it. In addition to the Silicon Valley model, this course explores lesser known internet economies around the world and proposals for a more equitable online future.

Grading Basis: Letter Grade

MDST 2012 (3) Hacker Culture

Chronicles the evolution of hacker culture from its origins as a geeky subculture to a criminal underground to its adaptation by CEOs. Considers how hacker formations sometimes represent a new kind of politics, sometimes a rejection of politics. Explores the contested figure of the hacker in the past, present and science-fiction of the internet.

Grading Basis: Letter Grade

MDST 2021 (3) Comic Books: Culture and Industry

Explores practices of comic culture across a broad range of graphic stories. Using culture studies approaches to industry analysis and fan community discourses, students examine culture created through and around graphic texts, particularly representations of race, gender, sexuality, institutions and ideology. Considers the political economy of the comic industry, the struggles of independent producers and active fan practices.

Grading Basis: Letter Grade

MDST 2031 (3) Documentary and Social Change

Explores how local, national and international filmmakers use documentaries to provide cultural observation, education, entertainment and memories to making sense of and transform the realities of contemporary societies. Emphasizes contemporary issues and practices in the production of documentaries, including the participatory means such as the crowdsourcing of documentary footage and the use of newer, non-theatrical means of distribution.

Grading Basis: Letter Grade

MDST 3001 (3) Media Research

Introduces theoretical approaches and practices used to analyze the content, structure, influence and contexts of media. Explores factors shaping media, including: politics, economics, technology, cultural traditions. Studies concepts, theoretical approaches and research methods of media criticism, and adopts and adapts these frameworks in analyses of mediated communication.

MDST 3002 (3) Digital Culture and Politics

Examines issues at the intersection of digital media, culture and politics, such as regulation and network architecture, piracy and hacking, and grassroots activism. Engage with a range of theories about cultural politics, democracy, liberalism and neo-liberalism in relation to digital information and communication technologies.

MDST 3201 (3) Media, Culture and Globalization

Surveys the political and economic structures of media system in developed and developing countries and discusses the impact of privatization, ownership consolidation, and globalization on the flow of information across national borders. Also looks at how global media flows and counter-flows affect conceptions of nationhood and cultural identity.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCI) or Program in Journalism Mass Communication (JOUR) or International Affairs (IAFS) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 3321 (3) Media Industries and Economics

Focuses on the institutions and practices of the media industries. Surveys the histories, structures, and activities of these organizations and the contemporary issues surrounding them.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 3331 (3) Sports-Media Complex

Explores the rich connections between the sports industry, spectating, the media complex and social life. Using theories of cultural studies and drawing on specific examples from the sports world, students focus on how sport shapes and reinforces understandings of gender, race, class and sexuality. Addresses major questions about the political economy, commodification, mediation and reception of the spectacle of the sports complex, as well as politics and cultural consequences of its transnational reach.

Equivalent - Duplicate Degree Credit Not Granted: JRNL 3804

Grading Basis: Letter Grade

MDST 3341 (3) Designing Alternative Media Platforms

Explores alternative forms of media to exhibit student research and build connections with community leaders. Surveys alternative exhibition traditions such as Social Practice, Relational Aesthetics and Craftivism to expand the impact of student work, culminating in the design of a unique cultural event focusing on each individual's research. Software/digital presentation skills.

MDST 3401 (3) Media, Food and Culture

Explores the topic of food as a subject of popular culture: essential to life and the enter of local, national and transnational conflict and social movements. Students will examine media representations of food, what our food choices say about us and what the mediated politics of food mean for our collective future.

Requisites: Requires a prerequisite course of MDST 2002 (minimum grade C-).

Grading Basis: Letter Grade

MDST 3711 (3) Media and Popular Culture

Examines culture in the form of discourse, symbols, and texts transmitted through the media. Explores the relationship between such mediated culture and social myth and ideology.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 3791 (3) Media and the Public

Provides an overview of how publishing in print and electronic forms has been tied closely to democratic ideals for centuries. Explores how the idea of the public is central to the theory and practice of media politics, and how the contested concepts of "the public sphere" and "public opinion" have long been linked to debates about the proper relationship between media and democratic citizenship.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Media, Communication, and Information (CMCIU) or Program in Journalism Mass Communication (JOURU) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4111 (3) Crime, Media and Contemporary Culture

Addressed in the course are a range of issues from within a variety of literatures that consider the ways in which the media cover crime. Those literatures are particularly drawn from sociology and the emergent, and increasingly dominant, field of cultural criminology. The focus of the class is to get students to think of "crime" as a constructed and mediated concept and set of narratives that often create problematic public "understandings".

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

MDST 4211 (3) Asian Media and Culture

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

Equivalent - Duplicate Degree Credit Not Granted: MDST 5211

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Asia Content

MDST 4221 (3) Media Technology and Cultural Change

Explores how media technologies affect social orders and shape cultural practices across the globe. Compares and critically evaluates different theories of technology, emphasizes the social construction of technology, asks how media technologies inform conceptions of social reality and individual identity and considers how media technologies can be understood across a range of academic disciplines.

Requisites: Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Grading Basis: Letter Grade

MDST 4231 (3) Youth Media: Culture and Politics

Emphasizes the sociological understandings of youth cultures, identities and practices in relation to media and politics. Topics include the influences of consumer branding, participatory culture, youth media production and representation, use of social media, mobile phones, gaming, and other digital media, and integrating them around themes of youth styles, gender, ethic, political identities, consumer culture, social behavior and other trends.

Requisites: Requires prerequisite course of MDST 3711 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

MDST 4311 (3) Mass Communication Criticism

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

Equivalent - Duplicate Degree Credit Not Granted: MDST 5311

MDST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture

Studies the construction, interconnections, and replications of gender, race, class, and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4341 (3) International Media and Global Crises

Examines strengths and limits on media's role in globalized crises (e.g. financial, climate change, health) in light of changing distribution of global power. Introduction to current crises; context-analytical approach to media technologies, financing and uses; application to national cases.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Media Studies (MDST) or International Affairs (IAFS) majors only.

Additional Information: Departmental Category: Asia Content

MDST 4361 (3) TV and the Family in American Culture and Society

Examines the history and character of two central institutions in American society—the family and television—to gain deeper understanding of their formative and enduring roles. Topics include: intersecting histories of the family and television; economic logic of the TV industry and programming; representations of the family in television programming; how families use and interact with television.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4371 (3) Media and Religion

Examines the way religion uses media as a social and political force. Introduces the major themes and trends in the mediation of religion and the religious inflection of the media in professional, popular, and emerging media contexts.

MDST 4372 (3) Islam, Pop Culture and Media

Explores the shifting boundaries of cultural and religious Muslim identities through media representation and production in Muslim-majority countries and in the West. Using popular culture as a complex site of struggle, this course examines how Muslims address questions of gender, ethnicity, class, democracy, sexuality, religion, and modernity in a variety of media forms and practices.

Grading Basis: Letter Grade

MDST 4401 (3) Fan and Audience Studies

Considers how audiences and fans are conceptualized, how they are constructed by media enterprises and how they operate within their cultural ecosystems. While media shape the sociocultural, political and economic dimensions of the social world, fan studies suggest a more active set of practices form sites of resistance and enable a greater degree of influence over cultural production.

Requisites: Requires prerequisite courses of MDST 2002 and MDST 3001 and MDST 3002 (all minimum grade C-).

Grading Basis: Letter Grade

MDST 4601 (3) Media Law, Policy and Ethics

Explores ethical and legal complexities of information and communication technology. Combines real-world inquiry with creative speculation to probe everyday ethical dilemmas faced by digital consumers, creators and coders, as well as policy-makers. Explore themes such as privacy, intellectual property, social justice, free speech, artificial intelligence, social media and ethical lessons from science fiction.

Grading Basis: Letter Grade

MDST 4841 (1-4) Undergraduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4871 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with a minimum of 75 hours taken.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 4931 (1-6) Internship

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Media Studies (MDST) majors only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 5001 (3) Connected Media Practices

Provides a crucial frame through which students understand the evolution of film, television and gaming in the digital era. Explores an impending revolution in how screen media are created, circulated and consumed. Relates to a larger trend across the media industries to integrate digital technology and socially networked communication with traditional screen media practices.

Requisites: Restricted to graduate students only.

MDST 5002 (3) Media Activism and Public Engagement

Explores politics of media activism. Relies on survey of existing theory and scholarship on media activism and close analyses of activist practices within both old and new media and on local, national and global scale. Special attention paid to questions of relativity and efficacy and value of media activism as both aesthetic and political activity.

Requisites: Requires a prerequisite course of MDST 5001 (minimum grade C-). Restricted to graduate students only.

MDST 5211 (3) Asian Media and Culture

Offers an understanding of the various people, cultures and nations of East Asia through their media systems. Provides a critical overview of the historical, cultural, social, political and economic dimensions of East Asian communication systems in today's digitally connected/disconnected world.

Equivalent - Duplicate Degree Credit Not Granted: MDST 4211

Requisites: Restricted to graduate students only.

MDST 5311 (3) Mass Communication Criticism

Introduces the critical perspectives most often employed in qualitative media analysis: semiology, structuralism, Marxism, psychoanalytical criticism, sociological criticism. Texts from contemporary print and broadcast media.

Equivalent - Duplicate Degree Credit Not Granted: MDST 4311

MDST 5331 (3) Gender, Race, Class, and Sexuality in Popular Culture

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 5841 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MDST 5851 (1-6) Graduate Professional Project

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

MDST 5871 (3) Special Topics

Special topics in Media Studies.

Requisites: Restricted to graduate students only.

MDST 5931 (1-3) Internship

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

MDST 6071 (3) Critical Theories of Media and Culture

Introduces students to critical theories and analysis of media and popular culture. Examines major theoretical traditions and/or theorists that significantly inform media studies (e.g., culturalism, structuralism, Marxism, critical theory, feminism, psychoanalysis, post-structuralism) and applies these to media analysis and criticism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6211 (3) Communication and International Development

Studies and analyzes communications technologies and techniques used in addressing social problems in developing countries.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6301 (3) Communication, Media, and Concepts of the Public

Introduces students to historical and contemporary uses of fundamental concepts in research and theory about media institutions, particularly public, community, mass, publicity, public space, public opinion, public interest, and the public sphere.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6311 (3) Power, Politics and Mediated Culture

Examines various literatures that consider the role of power in shaping social orders and the social beings that constitute that order and the place of media in both processes.

Requisites: Restricted to graduate students only.

MDST 6341 (3) Children, Youth and the Media

Examines the concepts of children and childhood from the historical, social, cultural, economic and political perspectives, this course explores the interaction between mass media and the socialization and cultivation process of children and youth. Multiple theoretical traditions are used as a framework to study a variety of issues related to children and the media.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6551 (3) Media and Communication Policy

Surveys historical and contemporary developments in media and communications policy, emphasizing social and cultural dimensions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6711 (3) Media and Popular Culture

Introduces fundamental methods for understanding the construction of meaning in film, television, popular music and advertising. Traces the study of popular culture through film theory, mass media analysis and cultural studies. Surveys various strands of research that seek to understand popular culture and its effects.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6771 (3) History of Media and Communication

Examines history of communication, including the means (technologies) of communication, social practices (institutional, collective, individual) that intersect with the study of communication and media, and cultural forms (texts, products). Situates the study of media, technology, and culture within historical contexts, comparative historical research, media archaeology, genealogy and media history.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6781 (3) Economic and Political Aspects of Media

Examines economic problems and political issues relevant to media institutions and industries.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Broadcast Journalism

MDST 6951 (1-6) Master's Thesis

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

MDST 7871 (3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Core Curriculum and General Electives

Medieval and Early Modern Studies (MEMS)

Courses

MEMS 2020 (3) Introduction to Medieval and Renaissance Studies

Introduces students to the literature, history, culture and art of Europe and the Mediterranean basin from late antiquity through the renaissance.

The course is interdisciplinary and focuses on topics which reveal the dynamism and diversity of pre-modern culture.

MEMS 4020 (3) Medieval and Early Modern Studies: Texts and Contexts

Focuses on communities in the Mediterranean basin and Europe (i.e., cloister, court and city), discussing major literary texts and visual monuments associated with them and their historical context.

Emphasizes tensions between tradition and innovation, Latin and vernacular, East and West, Christian and non-Christian (Jewish and Islam), sacred and secular, authority and freedom and male and female.

Equivalent - Duplicate Degree Credit Not Granted: MEMS 5020

Requisites: Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).

MEMS 4030 (3) Medieval and Early Modern Studies: Special Topics

Different topics offered by the faculty of the Medieval and Early Modern Studies Program in alternate semesters. Topics may include the literature of pilgrimage and travel, women and minorities, theatre, music, epic, medieval and early modern views of the classics, the Bible, and medieval and early modern theories of education.

Equivalent - Duplicate Degree Credit Not Granted: MEMS 5030

Requisites: Requires a prerequisite course of CLAS 1110 and CLAS 1120 and ENGL 2503 or HIST 1011 and HIST 1012 (minimum grade D-).

MEMS 5020 (3) Medieval and Early Modern Studies: Texts and Contexts

Focuses on communities in the Mediterranean basin and Europe (i.e., cloister, court and city), discussing major literary texts and visual monuments associated with them and their historical context.

Emphasizes tensions between tradition and innovation, Latin and vernacular, East and West, Christian and non-Christian (Jewish and Islam), sacred and secular, authority and freedom and male and female.

Equivalent - Duplicate Degree Credit Not Granted: MEMS 4020

Requisites: Restricted to Comparative Literature (CMLT) or Theatre (THTR) or Classics (CLAS) majors only.

Recommended: Prerequisite ability to use literary texts in their original language.

MEMS 5030 (3) Medieval and Early Modern Studies: Special Topics

Different topics offered by the faculty of the Medieval and Early Modern Studies Program in alternate semesters. Topics may include the literature of pilgrimage and travel, women and minorities, theatre, music, epic, medieval and early modern views of the classics, the Bible, and medieval and early modern theories of education.

Equivalent - Duplicate Degree Credit Not Granted: MEMS 4030

Requisites: Restricted to Comparative Literature (CMLT) or Theatre (THTR) or Classics (CLAS) majors only.

Recommended: Prerequisite ability to use literary texts in their original language.

Military Science - Army ROTC (MILR)

Courses

MILR 1011 (2) Adventures in Leadership 1

Introduces fundamentals of leadership and the United States Army. Examines its organization, customs, and history as well as its current relevance and purpose. Students also investigate basic leadership and management skills necessary to be successful in both military and civilian settings. Includes fundamentals of Army leadership doctrine, team-building concepts, time and stress management, an introduction to cartography and land navigation, marksmanship, briefing techniques, and some basic military tactics.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 1021 (2) Adventures in Leadership 2

Continues the investigation of leadership in small organizations. Covers selected topics such as basic troop leading procedures, military first aid and casualty evacuation concepts, creating ethical work climates, an introduction to Army organizations and installations, and a further examination of basic military tactics. Introduces students to effective military writing styles.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 2031 (3) Methods of Leadership and Management 1

Comprehensively reviews advanced leadership and management concepts including motivation, attitudes, communication skills, problem solving, human needs and behavior, and leadership self development. Students continue to refine effective written and oral communications skills and to explore topics such as the basic branches of the Army, and officer and NCO duties. Students conduct classroom and practical exercises in small unit light infantry tactics and are prepared to perform as midlevel leaders in the cadet organization.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 2041 (3) Methods of Leadership and Management 2

Focuses on leadership and management functions in military and corporate environments. Studies various components of Army leadership doctrine to include the four elements of leadership, leadership principles, risk management and planning theory, the be-know-do framework, and the Army leadership evaluation program. Continue to refine communication skills.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 3052 (3) Military Operations and Training 1

Further explores the theory of managing and leading small military units with an emphasis on practical applications at the squad and platoon levels. Students examine various leadership styles and techniques as they relate to advanced small unit tactics. Familiarizes students with a variety of topics such as cartography, land navigation, field craft and weapons systems. Involves multiple, evaluated leadership opportunities in field settings and hands-on experience with actual military equipment. Students are given maximum leadership opportunities in weekly labs.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 3062 (3) Military Operations and Training 2

Studies theoretical and practical applications of small unit leadership principles. Focuses on managing personnel and resources, the military decision making process, the operations order and oral communications. Exposes the student to tactical unit leadership in a variety of environments with a focus on preparation for the summer advance camp experience.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 3090 (1) Military Theory and Tactical Leadership

Application of military domain knowledge, small unit leadership skills and education on various subjects germane to military operations.

Examination of military tactics, techniques and procedures to better understand how to successfully accomplish multiple military requirements. Instructor consent required.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a corequisite course of MILR 1011 or 1021 or 2031 or 2041 or 3052 or 3062 or 4072 or 4082.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 4072 (3) Leadership 1: Adaptive Leadership

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: discusses personal growth, effective communication, critical thinking, problem solving and ethical leadership.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 4082 (3) Leadership 2: Leadership in a Complex World

Develops leaders of character that will excel in a complex, ambiguous and dynamic future operating environment: develops universal leadership attributes such as critical thinking and problem solving, understanding the contemporary operating environment and improved inter-personal dynamics/team building skills.

Recommended: Prerequisite instructor consent.

Additional Information: Departmental Category: Military Science (U.S. Army)

MILR 4840 (1-3) Independent Study

Additional Information: Departmental Category: Military Science (U.S. Army)

Molecular Cell & Developmental Biology (MCDB)

Courses

MCDB 1030 (3) Introduction to Molecular Biology

Introduces the foundation of molecular, cell, developmental and evolutionary biology in the context of human development and disease. Including how the immune system works to protect us from infections and technologies being developed towards the goal of better health around the world. For nonmajors.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MCDB 1041 (3) Fundamentals of Human Genetics

Covers the basic principles of genetics, human pedigree analysis, and how genetic diseases affect DNA, RNA, and proteins. Considers implications of this research for medicine and society. For nonmajors.

Recommended: Requisite good background in high school chemistry and biology.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MCDB 1043 (1) Exploring Genetics Laboratory

Provides hands-on experience with fundamental genetic principles. Topics include scientific method, experimental design, mitosis, meiosis, classical genetics, molecular genetics, mutagenesis, DNA analysis, and transgenic organisms. Wherever possible, the focus of the lab will be on integrating science process skills with human-relevant experiments to encourage students to learn and apply science skills while seeing the application to humans.

Requisites: Restricted to Biological Sciences (MCDB) non-majors only.

Recommended: Corequisite MCDB 1041.

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 1111 (3) Core Concepts in Biology I: Evolutionary, Molecular and Cell Biology

Web-based, in-class discussion course covering the fundamental properties shaping living systems. Uses evolutionary (including social) and physical-chemical mechanisms to frame molecular, cellular and organismic processes. Interpreting and answering questions scientifically as well as quantitative reasoning skills are stressed. Fulfills the MCDB major's requirement for MCDB 1150.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1150

Additional Information: Arts Sci Core Curr: Natural Science Sequence

MCDB 1150 (3) Introduction to Cellular and Molecular Biology

Covers biologically important macromolecules and biological processes, together with an introduction to cell structure, function, and physiology. Provides the foundation for advanced MCDB courses to majors, and a rigorous overview of modern biology to nonmajors. MCDB 1151 must be taken concurrently by MCDB and biochemistry majors and prehealth science students.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1111

Recommended: Prerequisite high school chemistry and algebra, and recommended corequisites of MCDB 1151 and MCDB 1152.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Natural Science Lab or Lab/Lec

MCDB 1151 (1) Introduction to Cell and Molecular Biology Lab

Offers one two-hour lab per week designed to acquaint students with research techniques and concepts in molecular and cellular biology. Topics include cell structure, function, physiology, and recombinant DNA.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 1111

Recommended: Corequisite MCDB 1150 or CHEN 2810 or EBIO 1210.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science Lab or Lab/Lec

MCDB 1152 (1) Problem Solving Co-Seminar for Introduction to Molecular and Cellular Biology

Uses problem solving and other interactive group work to aid student learning in a corequisite course, MCDB 1150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

Recommended: Corequisite MCDB 1150.

Grading Basis: Pass/Fail

MCDB 1161 (2) From Dirt to DNA: Phage Genomics Laboratory I

Provides laboratory experience working on a bacteriophage genomics research project. Students will study novel bacteriophage they isolate from the environment. Topics covered include phage biology, bacteria and phage culturing and amplification, DNA isolation, restriction digest analysis, agarose gel electrophoresis, and electron microscopy.

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 1171 (2) Drug Discovery Through Hands-on Screens I

Provides introductory research and laboratory experience. Students will work in teams to screen small molecule libraries for novel antibiotics using the bacterium Salmonella as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

Requisites: Requires corequisite course of MCDB 1150.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 2150 (3) Principles of Genetics

Introduces the behavior of genes and chromosomes in eukaryotic and prokaryotic organisms. Covers three areas: transmission genetics, molecular genetics, and population genetics. Attention is given to genetic mapping, recombinant DNA procedures, and gene expression.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 2222

Recommended: Prerequisite MCDB 1150 or EBIO 1210 or CHEN 2810 (minimum grade C-) and recommended corequisites of MCDB 2151 and MCDB 2152.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

MCDB 2151 (1) Principles of Genetics Laboratory

One two-hour lab per week. Provides hands-on experience with principles introduced in MCDB 2150. Topics include mitosis, meiosis, classical genetics, complementation, mutagenesis, DNA replication, natural selection, and evolution.

Recommended: Prerequisites MCDB 1150 and MCDB 1151 (all minimum grade D-), and recommended corequisite of MCDB 2150.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

MCDB 2152 (1) Problem Solving Co-Seminars for Genetics

Uses problem solving and other interactive group work to aid student learning in MCDB 2150. Students will work in small groups on learning and practicing how to solve difficult conceptual problems, as well as using hands-on activities and concept mapping to help learn content.

Recommended: Corequisite MCDB 2150.

Grading Basis: Pass/Fail

MCDB 2161 (2) From DNA to Genes, Phage Genomics Laboratory II

Provides laboratory experience working on a bacteriophage isolated during the previous semester. Topics include bioinformatics, genome annotation, open reading frame and RNA identification, BLAST analysis, phylogenetics and submission to a genomic database.

MCDB 2171 (2) Drug Discovery Through Hands-On Screens 2

Provides introductory research and laboratory experience. Students will work in teams to screen molecule libraries using fruit flies as a model system. Topics covered include the basic biology of the model system, genetics, approaches to screening for new therapeutics, statistical analysis of the data, compound verification and lead compound development.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires a corequisite course of MCDB 2150.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Lab

MCDB 2222 (3) Core Concepts in Biology II: Genes, Genetics and Phenotypes

Web-based, in-class discussion course focused on the origins of genetic variation and inheritance, genome dynamics and gene expression and their relationship to phenotype(s). Interpreting, explaining and answering questions scientifically as well as quantitative reasoning are stress. Course fulfills the departmental requirement for MCDB 2150.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 2150

Requisites: Requires a prerequisite course of MCDB 1111 or MCDB 1150 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Sequence

MCDB 2840 (1-3) Lower-Division Independent Study

Students with adequate prerequisites should take MCDB 4840.

Repeatable: Repeatable for up to 8.00 total credit hours.

MCDB 3010 (1-2) Undergraduate Teaching in Course-Based Undergraduate Research Experiences

To address the need for more advanced and continued participation in course-based research, MCDB 3010 is designed to train students who have taken MCDB 1171 or MCDB 2171 or MCDB 4202 as teaching assistants. The aim is to enhance the students' experience and responsibilities in course-based research and to prepare them for research and mentorship in a departmental or graduate laboratory.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of MCDB 1171 or MCDB 2171 or MCDB 1161 or MCDB 4202 (minimum grade B).

Grading Basis: Letter Grade

MCDB 3135 (3) Molecular Cell Biology I

Examines the central dogma of biology by discussing the most important molecules in cells (DNA, RNA and protein) and how their synthesis (DNA replication, transcription, RNA processing and translation) is regulated. Incorporated into the discussion is how recombinant DNA techniques are used to discover and dissect cellular processes, how to design and interpret experiments, and understanding the limits of experiments to draw conclusions. These principles are the foundation for subsequent examination of intracellular mechanisms in MCDB 3145.

Requisites: Requires prerequisite courses of MCDB 2150 or EBIO 2070 and CHEM 1113 or CHEM 1400 or CHEN 1211 (all minimum grade C-).

MCDB 3140 (2) Cell Biology Laboratory

One four-hour lab per week. Provides experience with and exposure to modern cell biology laboratory techniques. Topics include microscopy, immunocytochemistry, Western blotting, Southern blotting, and flow cytometry. This course does not use vertebrate animals.

Recommended: Corequisite MCDB 3135 or MCDB 3145.

MCDB 3145 (3) Molecular Cell Biology II

Examines intracellular mechanisms, including transport of ions and small molecules across membranes; protein targeting to organelles; membrane trafficking between organelles; signal transduction; the cytoskeleton; and the cell cycle. Analysis of these activities is from the experimental perspective established in MCDB 3135.

Recommended: Prerequisite MCDB 3135 (minimum grade C-), and recommended prerequisite or corequisite of MCDB 3140 concurrent with either this class or MCDB 3135.

MCDB 3150 (3) Biology of the Cancer Cell

Highlights dimensions of the cancer problem; cancer as a genetic/cellular disease; chemicals, viruses, and radiation as causes of cancer; cancer and diet; cancer epidemiology; cancer risk factors; proto-oncogenes, oncogenes, and cancer suppressor genes; and prevention of cancer.

Recommended: Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

MCDB 3160 (3) Pandemic! How the Genomics Revolution Can Save Us All

Illustrate how cutting edge tools in genomics can be used to study, monitor and cure disease caused by new and re-emerging human pathogens such as SARS/MERS, Ebola virus, Neisseria meningitides, influenza virus and malaria parasites. Technologies covered will include genome sequencing, annotation, transcriptomics, phylogenetics and genotyping of microbial populations. An integrated approach to this topic will be presented, with these concepts threaded throughout: natural history and evolution of pathogens, molecular biology, immunology, epidemiology, public health and clinical diagnosis. There may be some overlap with material covered in MCDB 1030 and MCDB 4750.

Requisites: Requires prerequisite course of MCDB 2150 or EBIO 2070 (minimum grade B-).

Grading Basis: Letter Grade

MCDB 3330 (3) Evolution and Creationism

Intensive lecture/discussion course on the interrelationships among science, religion, and social policy. Includes historical and scientific development of evolution theory, social Darwinism/sociobiology, and the public perception of science.

Recommended: Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

MCDB 3332 (1) Scientific Ethics

A reading/discussion course on the implications of modern biologically-based technologies, from in vitro fertilization and its variants and issues surrounding these techniques, to genomic testing of embryos and adults, the genetic engineering of organisms, including humans, to issues surrounding communicable diseases and vaccination. Discussion will include a serious consideration of various philosophical and non-scientific perspectives.

Requisites: Requires prerequisite course of MCDB 1150 or EBIO 1210 (minimum grade C). Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

MCDB 3333 (3) Biomedical Innovations and Discoveries

Discusses how biological inventions and discoveries fuel biomedical innovations, how important techniques in molecular biology have advanced our understanding of cellular processes and contributed to biotechnology revolution and biomedical sciences to benefit our society. Guest lectures from experts in industry and site visits will enhance the course by providing a non-academic perspective, networking opportunities, and unexpected avenues for career paths for our graduates. Department enforced prerequisite: MCDB 2150 or EBIO 2070 or instructor consent.

Grading Basis: Letter Grade

MCDB 3350 (3) Fertility, Sterility, and Early Mammalian Development

Describes the production of germ cells, ovulation, fertilization, reproductive cycles, controls of reproduction, early development of the embryo, methods of contraception, and causes and treatments of sterility. Recommended for students planning careers in the health sciences.

Recommended: Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-).

MCDB 3501 (3) Structural Methods for Biological Macromolecules

Teaches fundamental knowledge about protein structures, protein interactions and protein folding. Discusses in detail the most common methods on how proteins and macromolecular complexes are studied, such as X-ray crystallography, NMR-spectroscopy and electron microscopy. Offers about 50 percent direct teaching, 40 percent discussion of papers in a journal club style and 10 percent hands-on practicals on software packages relevant to structural biology. Formerly MCDB 4501.

Recommended: Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

MCDB 3650 (3) The Brain - From Molecules to Behavior

Examines the molecular basis of the brain's role in thought, action, and consciousness by exploring issues such as relationship of cognition and localized brain function, sensory systems and their role in cognition, learning and memory, and behavioral neurochemistry.

Recommended: Prerequisite MCDB 2150 or EBIO 2070 (minimum grade C-).

MCDB 3651 (3) The Brain: Dysfunction to Disease

Misregulation of synaptic function results in abnormal brain function and behavior that is manifested in numerous neurological and psychiatric diseases. Explores the molecular mechanisms responsible for altered synaptic plasticity in neurological diseases such as frontotemporal dementia (FTD), Parkinson's disease, Huntington's disease, Creutzfeldt-Jakob disease, Down syndrome, epilepsy, autism, and Alzheimer's disease.

Recommended: Prerequisites MCDB 3650 or NRSC 2100 (minimum grade C-) or instructor consent required.

Grading Basis: Letter Grade

MCDB 3700 (3) Poisons in Cell Biology and Society

Investigate the inner workings of our cells by studying how poisons disrupt these processes. We will learn how selected poisons affect critical processes inside the cell to cause death or destruction. The scientific aspects of the poison will be discussed in the context of its historical significance or impact on society and popular culture. Department enforced prerequisites: MCDB 1150 or EBIO 1210 and MCDB 2150.

MCDB 3990 (3) Introduction to Systems Biology for Biologists

Introduces majors with relatively little mathematical experience to the major concepts in systems biology, in the context of key processes (cell growth, division, adaptation, development, and disease). Designed to help students master the necessary mathematical tools involved.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and MATH 1310 (minimum grade C-).

Grading Basis: Letter Grade

MCDB 4100 (1-6) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4111 (3) Experimental Design and Research in Cell and Molecular Biology

Learning molecular and cell biology experimental design and approaches through independent research projects. Students, working in pairs, will explore the research process and gain extensive first-hand experience in: hypothesis formation; experimental design; solution preparation and experimental methodology; proposal presentation and defense (oral and written); formal presentation of results and conclusions (oral and written in a publication-style format); the publication process; critical reading and evaluation of primary scientific literature.

Recommended: Prerequisite MCDB 1150 or EBIO 1210 (minimum grade C-) and recommended corequisite of MCDB 3135.

MCDB 4201 (3) From Bench to Bedside: The Role of Science in Medicine

Demonstrates the breadth of research in the life sciences and how such research (not just in medical schools) can lead to medical applications. Lecturers from life sciences, the medical school and biotechnology, discuss drug development and the transfer of research into the clinical arena. Students also prepare a paper and presentation on the development of a commercial drug.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4202 (3) The Python Project

Studies how python hearts grow after they consume a meal. Understanding the molecular processes of growth and regression in the python heart could lead to development of therapeutics for heart disease. Students work in groups in the laboratory and generate novel data by using modern molecular biology and bioinformatic techniques to clone and sequence candidate molecules of the python genome. May be repeated once.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4234 (3) Research Methods

Presents a rigorous and pedagogically coherent introduction into the experimental process used to collect data, formulate hypotheses, and answer scientific questions in general, and biological questions in particular. Includes a detailed consideration of the elements of experimental design, data collection and analysis, and the interpretation of results in the context of effective science teaching. Part of the CU Teach course sequence for teacher certification in science and mathematics.

Requisites: Restricted to Biological Sciences (MCDB) majors or School of Education (EDUC) undergraduate students only.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4300 (3) Immunology

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5301

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4310 (3) Microbial Genetics and Physiology

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5310

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) and recommended corequisite of CHEM 4611.

MCDB 4312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5312

Grading Basis: Letter Grade

MCDB 4350 (3) Microbial Diversity and the Biosphere

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5350

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and CHEM 1133 and EBIO 3400 and/or CHEM 3311 (minimum grade C-).

MCDB 4361 (3) Evolution and Development

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development). Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5361

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4410 (3) Human Molecular Genetics

Studies the human organism as a genetic system, including effect of mutation on protein structure and function, biochemical basis of human genetic disease, polymorphic gene loci, gene mapping and identification, gene cloning and characterization, and impact of human genetics on medicine and society. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisite MCDB 3135 (minimum grade C-).

MCDB 4422 (3) Molecular Biology of Free Radicals: Role(s) in Oxidative Stress, Signaling, Disease, Aging

Examines how free radicals are formed in biological systems and their roles in oxidative stress, cell signalling, aging, and disease. Emphasis will be placed on the recent literature. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and CHEM 3311 (minimum grade C-).

MCDB 4425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5425

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

MCDB 4426 (3) Cell Signaling and Developmental Regulation

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5426

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and CHEM 4700 (minimum grade C-).

MCDB 4427 (3) Biology of the Visual System

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5427

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-) or instructor consent required.

MCDB 4441 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5441 and EBIO 4440 and EBIO 5440

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 or EBIO 2070 (minimum grade C-).

MCDB 4444 (3) Cellular Basis of Disease

Explores the cellular basis of disease. Discusses diseases arising from defects in intracellular targeting, cytoskeletal function, intracellular signaling, genomic instability, gene regulation, cell proliferation, and cell death. Involves student-organized presentations and classroom discussion. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4471 (3) Mechanisms of Gene Regulation in Eukaryotes

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5471

Recommended: Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

MCDB 4520 (3) Bioinformatics and Genomics

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5520

Recommended: Prerequisites MCDB 3135 or CHEM 4700 (minimum grade C-).

MCDB 4521 (1) Bioinformatics and Genomics Laboratory

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5521

Grading Basis: Letter Grade

MCDB 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5550 and PHYS 4550 and PHYS 5550

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 and MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

MCDB 4560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5560 and PHYS 4560 and PHYS 5560

Requisites: Requires a prerequisites course of PHYS 2210 (minimum grade C-).

Recommended: Prerequisite PHYS 4230.

Grading Basis: Letter Grade

MCDB 4615 (3) Biology of Stem Cells

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5615

Recommended: Prerequisite MCDB 3135 or MCDB 3145 or instructor consent required.

MCDB 4621 (3) Genome Databases: Mining and Management

Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4621 or CHEM 5621 MCDB 5621

Recommended: Prerequisite MCDB 3135 or CSCI 3104 or CHEM 4700 and recommended corequisite of CSCI 2270.

MCDB 4650 (3) Developmental Biology

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5651

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4680 (3) Mechanisms of Aging

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5680

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4750 (3) Animal Virology

Encompasses the structure and replication of both lytic and transforming animal viruses. Emphasizes diversity of naturally occurring genomic structures and the resulting strategies of infection as well as the impact of viral epidemics on society. Includes critical analysis of primary research papers. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisite MCDB 3135 (minimum grade C-) or instructor consent required.

MCDB 4777 (3) Molecular Neurobiology

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5777

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4790 (3) Experimental Embryology

Embryology is studied by considering experiments relevant to specific topics of early animal development. Emphasizes reading, interpretation, and discussion of research articles.

Recommended: Prerequisites MCDB 3135 and MCDB 3145 (minimum grade C-).

MCDB 4810 (3) Insane in the Membrane: The Biology and Biophysics of the Membrane

Studies the biology and physics of the biomembrane. Topics include structure and mechanism of membrane proteins; membrane biogenesis; membrane protein folding and stability; membrane homeostasis; mechanisms of membrane fusion and fission; lipid trafficking. Fulfills MCDB scientific reasoning requirement.

Recommended: Prerequisite CHEM 4700 (minimum grade C-) or instructor consent required.

MCDB 4811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5811 and EDUC 4811 and EDUC 6811

Recommended: Prerequisites MCDB 1150 or EBIO 1210 and MCDB 2150 and MCDB 3145.

MCDB 4840 (1-6) Upper-Division Independent Study

An independent study contract is required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Recommended: Prerequisite MCDB 2150.

MCDB 4980 (3) Honors Research

Provides faculty-supervised research for students who have been approved by the departmental honors committee. Normally taken during the semester before completion of the honors thesis.

Recommended: Prerequisite MCDB 4840 or comparable research experience, and minimum GPA of 3.20.

Additional Information: Arts Sciences Honors Course

MCDB 4990 (3) Honors Thesis

Involves the preparation and defense of an honors thesis, based on faculty-supervised original research, including final phases of the research project.

Recommended: Prerequisites MCDB 4840 or MCDB 4980 or comparable research experience, and minimum GPA of 3.3 and approval by the MCDB Honors Committee.

Additional Information: Arts Sciences Honors Course

MCDB 5210 (3) Cell Structure and Function (Lecture and Discussion)**MCDB 5220 (3) Molecular Genetics (Methods and Logic)**

Requisites: Restricted to graduate students only.

MCDB 5230 (3) Gene Expression (Lecture and Discussion)

Requisites: Restricted to graduate students only.

MCDB 5250 (3) Topics in Developmental Genetics (Methods and Logic)

Repeatable: Repeatable for up to 6.00 total credit hours.

MCDB 5301 (3) Immunology

Emphasizes cellular and molecular mechanisms by which organisms protect themselves from pathogens and the experimental basis for our understanding of these processes. Discusses development, function, and malfunction of t-cells, b-cells and other components of the immune system, focusing on the human immune system.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4300

Requisites: Restricted to graduate students only.

MCDB 5310 (3) Microbial Genetics and Physiology

Examines the physiology and genetics of bacteria, Archaea and viruses. Particular emphasis will be on metabolism, regulation of gene expression and protein function, mechanisms of interactions with and manipulation of the environment, and evolution in response to environmental pressures.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4310

MCDB 5312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis. MATLAB will be taught throughout the course and used for image processing.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4312

Grading Basis: Letter Grade

MCDB 5350 (3) Microbial Diversity and the Biosphere

Provides a molecular phylogeny-based perspective on microbial diversity and the interactions between organisms that result in the biosphere. Provides overview of recent methods and findings in microbial ecology, as well as computer-based workshop in molecular phylogeny.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4350

Requisites: Restricted to graduate students only.

MCDB 5361 (3) Evolution and Development

Relates how recent discoveries in the molecular mechanisms of development are shaping our understanding of animal evolution. Reviews basic principles of molecular developmental biology and applies these concepts to critically discuss current research in the field of Evo-Devo (evolution and development).

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4361

MCDB 5425 (3) Topics in Membrane Biology: Cell Biology, Physiology and Disease

Students will apply their knowledge of basic biology to exploring several of the most exciting topics in biomedicine including protein folding and stress responses, nutrient sensing and balance and signal transduction across membranes. Emphasis will be placed upon human physiology and associated human diseases including Alzheimer's disease, diabetes and cardiovascular disease.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4425

Requisites: Restricted to graduate students only.

MCDB 5426 (3) Cell Signaling and Developmental Regulation

Introduces several cell signaling processes and their biological functions. Students read and analyze original research articles to learn the thinking processes of scientific research. Writing assignments and oral presentations are required.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4426

MCDB 5427 (3) Biology of the Visual System

Explores the neurobiology, cell biology, genetics and developmental biology of the visual system. Discusses neurodegenerative and vascular diseases that lead to blindness. Students read and analyze original research articles to train scientific reasoning. Involves student-organized presentations and classroom discussion.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4427

Requisites: Requires prerequisite courses of MCDB 3135 and MCDB 3145 (all minimum grade D-).

MCDB 5441 (4) Animal Developmental Diversity

Surveys development in a range of vertebrate and invertebrate systems to reconstruct the common bilaterian ancestor, and elucidate the developmental genetic changes underlying animal diversification. Lab focuses on vertebrate embryos and explores key methods in evolutionary developmental biology including in situ hybridization, embryo microinjection, and transgenesis.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4441 and EBIO 4440 and EBIO 5440

Requisites: Restricted to graduate students only.

MCDB 5471 (3) Mechanisms of Gene Regulation in Eukaryotes

Focuses on manifestations of regulated gene expression. Studies gene regulation at multiple steps, including transcription, RNA processing and translation. Is based on critical analysis of primary research papers. Written assignments and oral presentations are required.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4471

MCDB 5520 (3) Bioinformatics and Genomics

Computational and experimental methods in bioinformatics and genomics, and how these methods provide insights into protein structure and function, molecular evolution, biological diversity, cell biology and human disease. Topics include database searching, multiple sequence alignment, molecular phylogeny, microarrays, proteomics and pharmacogenomics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4520

Requisites: Restricted to graduate students only.

MCDB 5521 (1) Bioinformatics and Genomics Laboratory

Provides experience with, and exposure to, computational and experimental methods in bioinformatics and genomics. Meets once a week. Students are expected to read original research papers, discuss findings, plan and execute data analysis in selected areas.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4521

Grading Basis: Letter Grade

MCDB 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4550 and PHYS 4550 and PHYS 5550

MCDB 5560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4560 and PHYS 4560 and PHYS 5560

Grading Basis: Letter Grade

MCDB 5615 (3) Biology of Stem Cells

Stem cells have received considerable notice in both the scientific and social arena. Examines the stem cell concept by a critical examination of the primary scientific literature. Topics will include pluripotency and plasticity, environment, technology, self-renewal, transdifferentiation, molecular signature, epigenetic programming and stem cell versus cancer cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4615

Requisites: Restricted to graduate students only.

MCDB 5621 (3) Genome Databases: Mining and Management

Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 4621 or CHEM 5621 MCDB 4621

MCDB 5650 (1) Teaching and Learning in Undergraduate Science Courses

Discusses recent research on how students learn and applications to the teaching of undergraduate science courses. Conducted as an interactive workshop, in which active-engagement in learning approaches are modeled and experienced by participants. Open to undergraduate and graduate students. May be used to fulfill the pedagogical training requirement for undergraduate Learning Assistants in upper division science courses. Post-doctoral and faculty auditors are welcome to participate as regular auditors.

MCDB 5651 (3) Developmental Biology

Explores the development of invertebrate and vertebrate organisms, emphasizing cellular, molecular and genetic mechanisms. Focuses on conceptual understanding and experimental approaches to topics such as embryology, developmental control of gene expression in eukaryotic cells, mechanisms of differentiation and morphogenesis and developmental genetics.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4650

Requisites: Restricted to graduate students only.

MCDB 5680 (3) Mechanisms of Aging

Studies aging as a developmental process emphasizing genetic, cellular and molecular mechanisms.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4680

Requisites: Restricted to graduate students only.

MCDB 5776 (1) Scientific Ethics and Responsible Conduct in Research

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 5776

Requisites: Requires a corequisite course of MCDB 5230 or CHEM 5771.

MCDB 5777 (3) Molecular Neurobiology

Introduces the functional anatomy of the nervous system and explores current knowledge regarding the molecular and genetic basis of the development and function of the nervous system. Studies recent insights into the molecular basis of neurodegenerative diseases, in the last portion of the course.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4777

MCDB 5811 (3) Teaching and Learning Biology

Provides an introduction to recent research into student learning on the conceptual foundations of modern biology, together with pedagogical methods associated with effective instruction and its valuation. Students will be involved in active research into conceptual and practical issues involved in biology education, methods to discover student preconceptions, and the design, testing and evaluation of various instructional interventions.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4811 and EDUC 4811 and EDUC 6811

Requisites: Restricted to graduate students only.

MCDB 6000 (3) Introduction to Laboratory Methods

Introduces methodology and techniques used in biological research. Designed as a tutorial between a few students and one faculty member. Students are expected to read original research papers, discuss findings, and to plan and execute experiments in selected areas. Open only to MCDB graduate students.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Biological Sciences (MCDB) graduate students only.

MCDB 6440 (1-3) Special Topics in MCD Biology

Acquaints students with various topics not normally covered in the curriculum. Offered intermittently or upon student demand, and often presented by visiting professors.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

MCDB 6621 (1) Special Topics in RNA

Reviews and evaluates recent scientific literature in the field of RNA chemistry and biology, including topics in structure, catalysis, bioinformatic approaches and control of gene expression. Primarily for graduate level presentation of special topics by students and research staff.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 6621

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

MCDB 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

MCDB 6950 (1-6) Master's Thesis

Students seeking a master's degree should consult a departmental advisor. Plan I or Plan II is offered.

MCDB 7840 (1-6) Graduate Independent Study

An independent study contract is required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

MCDB 7910 (1) Seminar Practicum

Designed for graduate students to give oral presentations on their thesis research, field questions, respond to critiques, and present background information.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

MCDB 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.

MS Business Core (MSBC)

Courses

MSBC 5015 (3) Managerial Economics

Studies the elements of the business firm's fundamental problem: how to maximize profits. Develops for each element managerial theory based upon introductory and intermediate level microeconomics. Analyzes various applications and misapplications of relevant concept, primarily through case studies. Differential calculus and statistics are used throughout the course.

Requisites: Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5020 (3) Financial Accounting

Introduces the financial reporting system used by business organizations to convey information about their economic affairs. Develops an understanding of financial reports and what they tell about a business enterprise. Focuses on how alternative accounting measurement rules represent different economic events in financial reports.

Requisites: Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5030 (3) Quantitative Methods

Covers foundations for statistical reasoning and statistical applications in business. Topics include graduate level treatment of descriptive statistics, probability, probability distributions, sampling theory and sampling distributions and statistical inference (estimation and hypothesis testing). Provides an introduction to regression analysis, analysis of variance, time series forecasting, decision analysis, index numbers, and nonparametric methods.

Requisites: Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5060 (3) Corporate Finance

Analyzes the implications of modern finance theory for the major decisions faced by corporate financial managers. Develops the basic skills necessary to apply financial concepts to the various problems faced by a firm. Includes capital budgeting, capital structure, long term financing, short term financial management and financial planning topics.

Requisites: Restricted to Finance (FNCE-MS) or Real Estate (REAL-MS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5070 (3) Survey of Business Analytics

Designed as an introduction to Business Analytics, which considers the extensive use of data, methods and fact-based management to support and improve decision making. Business intelligence focuses on data handling, queries and reports to generate information associated with products, services and customers, business analytics uses data and models to explain business performance and how it can be improved.

Requisites: Restricted to Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5460 (3) Supply Chain Strategy

Introduces students to the fundamental principles underlying supply chains, and focuses on the integration with both operations and logistics.

Requisites: Restricted to Supply Chain Management (SCMN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5480 (3) Supervised Supply Chain Internship

Provides an opportunity to execute a project for a company, integrating course work knowledge in an applied capstone experience. Allows first hand exposure to the business analytics as both an observer and creator of the business analytics process. Students work closely with an area client company to solve an important business analytics problem under the close supervision of the instructor.

Requisites: Restricted to Supply Chain Management (SCMN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MSBC 5490 (3) Supervised Business Analytics Internship

Provides an opportunity to execute a project for a company, integrating course work knowledge in an applied capstone experience. Allows first hand exposure to the business analytics as both an observer and creator of the business analytics process. Students work closely with an area client company to solve an important business analytics problem under the close supervision of the instructor.

Requisites: Restricted to Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Core

MS Business Electives (MSBX)

Courses

MSBX 5205 (3) Financial Strategy and Decision Modeling

Develops functional frameworks for analyzing and assessing uncertainty in real and financial assets and evaluating financial decisions under diverse scenarios. This course covers various methods of mapping uncertainty including binomial decision tree models, linear programming models and Monte-Carlo simulations. Further topics include tax consequences of these decisions.

Requisites: Restricted to Finance (FNCE-MS) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5215 (3) Security Analysis and Valuation

Develops the skills to value assets associated with private and public firms by constructing valuation models employing macroeconomic, sector, industry and company-level market, financial market and accounting data. Topics include financial statements analysis, cash flows measures and forecasting, multiples and comps as well as quality of inputs and methods for dealing with parameter uncertainty.

Requisites: Requires prerequisite courses of MBAX 6220 and 6260 (all min grade D-). Restricted to Master of Finance (FNCE), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5225 (3) Advanced Portfolio Management

Covers the management and construction of investment portfolios. Topics include performance and risk measures, identification of risk factors and the use of traditional and alternative assets classes including real estate, mutual funds, ETFs, venture capital funds, private equity funds and hedge funds. Additional topics include tax consequences of investment decisions and cash management.

Requisites: Requires prereq courses of MBAX 6220, 6250 and 6260 (all min grade D-). Restricted to Master of Finance (FNCE), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5310 (3) Customer Analytics

Provides a deep understanding of customer centricity and its implications for the firm; state-of-the art methods for calculating customer lifetime value and customer equity; analytical and empirical skills that are needed to judge the appropriateness, performance, and value of different statistical techniques that can be used to address a issue around customer acquisition, development, and retention.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5405 (3) Structured Data Modeling and Analysis

Explores both the functional and technical environment for the creation, storage and use of the most prevalent source and type of data for business analysis, ERP and related structured data. Students will learn how to access and leverage information via SQL for analysis, aggregation to visualization, create dashboards, and be source for business intelligence.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5410 (3) Fundamentals of Data Analytics

Exposes the students to commonly used platforms for statistical and predictive analytics. The class will go into depth of analytics using R before demonstrating the same concepts using SPSS and SAS. Students will learn to analyze large datasets, including textual analytics such as twitter-stream analysis using R.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5415 (3) Advanced Data Analytics

Explores the capabilities and challenges of data-driven business decision making and prepares students to lead in analytics-driven organizations. Introduces a set of common predictive and prescriptive analytics tools. Students apply the analytics tools to important decisions based on practical data sets from various companies. Analytics software packages are used extensively in the course.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5420 (3) Unstructured and Distributed Data Modeling and Analysis

Moves the student beyond structured data and sources into business scenarios where data is semi-structured to unstructured such as those from social and web applications. Specific topics include introduction to SQL-on-Hadoop, NoSQL and related distributed processing technologies. Students will learn practical application and mechanisms for getting this sort of data ready for analytics.

Requisites: Requires prereq course of MSBX 5405 (min grade D-). Restricted to Master of Business Admin (MBAD), MBA w/ Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Prof'l MBA Program (PMBA) Supply Chain Mgmt (SCMN) or Business Analytics (BUAN) majors only.
Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5430 (3) Advanced Statistical Analysis

Introduces advanced multivariate regression analysis and residual diagnostics, logistic regression, analysis of variance (ANOVA and MANOVA), time series models, and analysis of categorical variables. R, an open source programming language for statistical computing and graphics, will be used. It is assumed students have mastery of introductory statistics topics including descriptive tools, inference, and ordinary least squares regression.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or Business Analytics (BUAN) majors only.
Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5435 (3) Planning and Production

At the core of GDP and productivity is the science of planning new products of services in design, bringing them to market then producing and replicating it in reliable, dependable, scalable fashion. The course takes an in-depth look at the mechanisms for supporting new product/process design in a scaled, often world-wide supply chain. (MRP, Six Sigma, Modeling Software, Heuristic Model use).

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Additional Information: Departmental Category: MS: Business Electives

MSBX 5440 (3) Decision Analysis

Covers both behavioral/psychological aspects and analytical approaches to making decisions with multiple objectives. The focus for the course is learning to frame decisions that involve multiple stakeholders with multiple objectives and then learning the various techniques used to evaluate the choices. Influence diagrams, decision heuristics using spreadsheets, and decision trees will all be explored with user-friendly decision tree software.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA), Supply Chain Management (SCMN) or Business Analytics (BUAN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5450 (3) Transportation and Logistics

Examines critical elements of distribution and logistics management, including physical distribution, supply chain echelon planning, warehouse (transportation note) selection and location, material handling, inventory quantity and location and other topics.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or Supply Chain Management (SCMN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5470 (3) Procurement and Contracting

Examines principles and concepts of the acquisition process from commercial and governmental perspectives, focusing on the procurement process, including planning, source selection, solicitation writing, negotiations and oral discussions, contract preparation and administration.

Requisites: Restricted to Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA), Professional MBA Program (PMBA) or Supply Chain Management (SCMN) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

MSBX 5605 (3) Real Estate Investment and Risk Management

Examines strategies for mitigating the legal, property and portfolio risks associated with income properties. The course begins by examining risks created by leases. The course then analyzes the risks associated with a single property and examines how risk changes with portfolios containing multiple properties. Finally, the course examines how to optimally incorporate investment properties in mixed asset portfolios.

Requisites: Requires prerequisite course of MBAX 6610 (min grade D-). Restricted to Master's students in Real Estate (REAL), Master of Business Admin (MBAD), MBA with Dual Degree (DMBA), Joint Juris Doctor/MBA (JMBA) or Professional MBA Program (PMBA) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: MS: Business Electives

Museum (MUSM)

Courses

MUSM 4010 (3) Museums and Society

Investigates the museum as an institution in society; history of museums and changing roles and methods in society; administrative structure; museum profession; methodology of museum collections, exhibitions, and education. Designed for students interested in museums or museum careers.

Additional Information: Departmental Category: Museum Studies

MUSM 4473 (3) Museum Field Methods in Botany

Emphasizes field techniques for observation, analysis, and identification of vascular plants, collection, preservation, and date recording for museum specimens.

Additional Information: Departmental Category: Botany

MUSM 4484 (3) Museum Field Methods in Geology

Paleontological and paleoecological field techniques including collecting; recording of geographic, stratigraphic and quarry information; preservation; interpretation, including applicable readings. Designed for individuals who have some background in geology but little or no prior field experience. Offered summer only.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5484

Additional Information: Departmental Category: Geology

MUSM 4795 (3) Field Methods in Zoology and Botany

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods, and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5795 and ENVS 4795

Additional Information: Departmental Category: Zoology

MUSM 4900 (1-6) Independent Study

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5900

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

MUSM 4912 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5912 and ANTH 4470 and ANTH 5470

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Anthropology

MUSM 4913 (3) Museum Practicum in Botany

Students take part in curatorial procedures of the botany section of the museum: specimen preparation, labeling, identification, cataloguing, conservation and collection management. Enrollment is limited therefore students should make arrangements during the previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5913

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Botany

MUSM 4914 (3) Museum Practicum in Geology

Students take part in curatorial procedures of the geology section of the museum: field collection, specimen preparation, cataloguing, collection management and a survey of current laws as they apply to specimens. Enrollment is limited therefore students should make arrangements during the previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5914

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Geology

MUSM 4915 (1-3) Museum Practicum in Zoology

Students take part in basic curatorial procedures of the zoology section of the museum: relaxing, fixing, positioning, preserving, cataloguing, storing and shipping. Also introduces students to the animal kingdom.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5915

Additional Information: Departmental Category: Zoology

MUSM 4916 (1-3) Museum Practicum in Entomology

Students take part in curatorial procedures of the entomology section of the museum: field collection, specimen preparation, labeling, identification, rearing techniques and exhibit preparation. Department recommended prerequisite: MUSM 5011. Enrollment is limited, students should make arrangements during previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5916

Additional Information: Departmental Category: Entomology

MUSM 4917 (1-3) Museum Practicum in Techniques

Students participate in museum public education functions that may include researching, planning, developing, and producing exhibits, traveling trunks, booklets, and other materials. May involve writing labels, molding and casting, conservation, and restoration.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 5917

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Museology

MUSM 5011 (4) Introduction to Museum Studies

Provides background in history and literature of museums, their objectives and methods, laboratory exercises in curatorship, exhibition theory, and administration.

Additional Information: Departmental Category: Museum Studies

MUSM 5021 (2-3) Selected Museum Topics

Additional Information: Departmental Category: Museum Studies

MUSM 5030 (3) Museum Education

Surveys and discusses the educational role of museums and informal learning centers. Issues include current trends, learning theories and styles, learning from objects, education programs, diverse audiences, museum/school partnerships, and the role of education in exhibit development.

Additional Information: Departmental Category: Museum Studies

MUSM 5031 (3) Museums and the Public: Exhibit Development

Covers elements of exhibition development and design, up to production and evaluation of exhibit prototypes. The team approach is emphasized. Department enforced prerequisite: restricted to graduate students.

Additional Information: Departmental Category: Museum Studies

MUSM 5041 (3) Museum Administration

Covers theory of organizations and how it applies to museums, application of small business management and nonprofit organizations to museums, marketing and development and grant writing and funding strategies. Department enforced prerequisite: restricted to graduate students.

Additional Information: Departmental Category: Museum Studies

MUSM 5045 (3) Introduction to Museum Anthropology

Traces the development of Anthropology and museums in America from late 19th century to present day. Students are encouraged to: explore museum theory and practice; think critically about the history of relations among Native Americans, Anthropology, and museums; consider the legacy of collecting and challenges of representing others; and, examine the interplay of Anthropology, material culture, and colonialism.

Equivalent - Duplicate Degree Credit Not Granted: ANTH 4045 and ANTH 5045

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Anthropology

MUSM 5051 (3) Museum Collections Management

Deals specifically with curation and data management. Topics include acquisition practices and problems; organization, management, use and preventive conservation of collections; computer data management of collections.

Additional Information: Departmental Category: Museum Studies

MUSM 5061 (3) Introduction to Scientific Illustration

Intended for students with little to no art background. Focus is on the accurate rendering of scientific subjects for publication and for public display. Course begins with basic drawing skills and sharpening of visual perception. Students progress to be able to produce realistic renderings of subjects. Students are exposed to a variety of black and white and color techniques and the standards for presenting illustrations for a variety of audiences. Course concludes with computer illustration tools and techniques.

Additional Information: Departmental Category: Museum Studies

MUSM 5474 (4) Vertebrate Paleontology

Discusses the history and evolution of the vertebrates, including the phylogenetic relationships and evolutionary patterns of the major groups. Lab focuses on comparative vertebrate osteology and fossil representation of major groups.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 4474 and GEOL 5474

Additional Information: Departmental Category: Geology

MUSM 5484 (3) Museum Field Methods in Geology

Paleontological and paleoecological field techniques including collecting; recording of geographic, stratigraphic and quarry information; preservation; interpretation, including applicable readings. Designed for individuals who have some background in geology but little or no prior field experience. Offered summer only.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4484

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Geology

MUSM 5760 (4) Mammalogy

Lect., lab, and field studies. Discusses origin, evolution and adaptation, geographic distribution, ecology and taxonomy of mammals; field and laboratory study of Coloradan species. Uses animals and/or animal tissues.

Equivalent - Duplicate Degree Credit Not Granted: EBIO 4760 and EBIO 5760

Additional Information: Departmental Category: Zoology

MUSM 5795 (3) Field Methods in Zoology and Botany

Class covers research and field methods for biological disciplines associated with natural history museums: vertebrates, invertebrates and plants. Emphasis is on field research techniques: observations, sampling, collection and preservation methods, and comparisons among elevation zones. Includes 5 field labs, 2 weekend trips, 5 lab practica, experience with several taxonomic experts and individual research projects.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4795 and ENVS 4795

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Zoology

MUSM 5900 (1-6) Graduate Independent Study

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4900

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

MUSM 5912 (3) Collections Research Practicum in Cultural Anthropology

Designed as a practicum, introduces students to research and practice in museum anthropology, utilizing the extensive anthropology collections at CU-Boulder Museum. Students will gain skills in primary and secondary research, collections and object research and narrative story development for the exhibition of anthropological material culture.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4912 and ANTH 4470 and ANTH 5470

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Anthropology

MUSM 5913 (3) Museum Practicum in Botany

Students take part in curatorial procedures of the botany section of the museum: specimen preparation, labeling, identification, cataloguing, conservation and collection management. Enrollment is limited therefore students should make arrangements during the previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4913

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Botany

MUSM 5914 (3) Museum Practicum in Geology

Students take part in curatorial procedures of the geology section of the museum: field collection, specimen preparation, cataloguing, collection management and a survey of current laws as they apply to specimens. Enrollment is limited therefore students should make arrangements during the previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4914

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Geology

MUSM 5915 (1-3) Museum Practicum in Zoology

Students take part in basic curatorial procedures of the zoology section of the museum: relaxing, fixing, positioning, preserving, cataloguing, storing and shipping. Also introduces students to the animal kingdom.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4915

Additional Information: Departmental Category: Zoology

MUSM 5916 (1-3) Museum Practicum in Entomology

Students take part in curatorial procedures of the entomology section of the museum: field collection, specimen preparation, labeling, identification, rearing techniques and exhibit preparation. Enrollment is limited, students should make arrangements during previous semester.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4916

Recommended: Prerequisite MUSM 5011.

Additional Information: Departmental Category: Entomology

MUSM 5917 (1-3) Museum Practicum in Techniques

Students participate in museum public education functions that may include researching, planning, developing, and producing exhibits, traveling trunks, booklets, and other materials. May involve writing labels, molding and casting, conservation, and restoration.

Equivalent - Duplicate Degree Credit Not Granted: MUSM 4917

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Museology

MUSM 5918 (3) Museum Practicum in Advanced Collections Management

Provides a hands-on environment for exploring issues in museum collections management. Through lecture, resource procurement, in-class activities and out-of-class projects, students will gain practical and professional experience in areas of policy, procedure, best practices, museum storage planning and legal issues.

Recommended: Prerequisite MUSM 5051.

Additional Information: Departmental Category: Museum Studies

MUSM 6110 (1-3) Seminar in Museum Issues

Offers a weekly seminar for museum and field study students that addresses one new topic each semester relevant to museum operations such as archival administration, museums, multiculturalism, repatriation and others. Department enforced prerequisite: MUSM 5011.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Museum Studies

MUSM 6150 (3) Critical and Theoretical Issues in Museums

Investigates key problems facing museum institutions and studies the staging and representation of historical knowledge, the ethics of collecting and display, the changing nature and uses of historical evidence and relations between curatorial practice, collecting and field work. Critically examines different approaches to museums and museology in various disciplines, both past and present. Department enforced prerequisite: MUSM 5011.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 6150 and HIST 6150 and ANTH 6150

Additional Information: Departmental Category: Museum Studies

MUSM 6930 (2-4) Museum Internship

Provides experience in museums of different sizes, audiences, and subjects, including history, natural history, art, and children's museums. Each student is supervised individually by a faculty member as well as the appropriate person in the cooperating museum.

Additional Information: Departmental Category: Museum Studies

MUSM 6940 (1-4) Master's Degree Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Museum Studies

MUSM 6950 (1-6) Master's Thesis in Museum and Field Studies

A thesis, which may be of a research, expository, critical or creative type, is required of every master's degree candidate under the thesis option. Department enforced prerequisites: MUSM 5011 and MUSM 5051 and one of the following: MUSM 5030 or MUSM 5031 or MUSM 5041.

Additional Information: Departmental Category: Museum Studies

MUSM 6960 (1-4) Master's Project or Paper in Museum and Field Studies

A project or paper in the student's discipline and related to some aspect of museum studies is required of every master's degree candidate under the non-thesis-option plan. Department enforced prerequisites: MUSM 5011 and MUSM 5051. Students in collections/field track also need MUSM 5030 or MUSM 5031 or MUSM 5041.

Additional Information: Departmental Category: Museum Studies

Music (MUSC)

Courses

MUSC 1081 (3) Intensive Music Theory

Introduces diatonic harmony and voice leading with intensive work on fundamentals (keys, intervals, triads, seventh chords and four-voice writing). The study of theoretical concepts is closely coordinated with aural skills. Feeds into the intensive section of MUSC 1111. Offered fall only.

Requisites: Requires corequisite course of MUSC 1121. Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1101 (2) Semester 1 Theory

Introduces the fundamentals of diatonic harmony and voice leading, focusing on model composition (including one-, two- and four-voice writing) and analysis of excerpts from music literature. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1103 (1) Becoming a Music Teacher

Provides an introduction to basic principles and practices of the music education profession. Explores contexts and methods of public school music teaching through class discussions, practice teaching and directed observations. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Letter Grade

MUSC 1111 (2) Semester 2 Theory

Continuation of MUSC 1101. Explores principles of harmony, voice leading and form. Continues emphasis on both model composition and analysis. Introduces chromatic elements (such as applied dominants and modulation), harmonic syntax and structural analysis of excerpts from music literature. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1101 or MUSC 1081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1121 (1) Aural Skills Lab, Semester 1

Focuses on sight singing, rhythm and dictation of diatonic melodies in major and minor keys (treble, alto and bass clefs). Covers identification of scale types, intervals, triads and dominant seventh chords. Includes individual and group improvisation. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1131 (1) Aural Skills Lab, Semester 2

Continuation of MUSC 1121. Focuses on sight singing, rhythm and dictation of diatonic melodies; adds chromatic elements, more complex rhythms and two-part dictation. Includes harmonic dictation using vocabulary from MUSC 1111. Includes individual and group improvisation within harmonic contexts. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1121 (minimum grade D-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 1325 (1) Piano Sight Reading

Studies techniques for improving sight-reading skills at the keyboard, with practical work in solo, ensemble and choral literature. Also covers score reading and transposition. Restricted to piano majors or instructor consent required. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 1326 (1) Guitar Musicianship

Activities in sight-reading, fretboard harmony and comprehension of harmony and texture. Some work will be tied to the repertoire being studied in studio lessons. Open only to students with an emphasis on guitar performance in their degree plan.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 1544 (1) Italian Diction

Designed for the understanding of lyric Italian diction, the international phonetic alphabet, and its application to classical singing. Required for freshmen BM voice majors. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 1554 (1) English Diction

Designed for the understanding of lyric English diction, the international phonetic alphabet, and its application to classical singing as well as various musical styles of English classical voice literature. Required for Freshmen BM voice majors.

Requisites: Requires prerequisite course of MUSC 1544 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 1802 (3) Introduction to Musical Styles and Ideas

Introduces the study of musical traditions of the world; equips students with requisite skills for understanding and analyzing music as an art in historical and cultural contexts using an integrative approach that includes selected styles and genres, critical reading and writing skills and mastery of conceptual issues related to the discipline of music. Satisfies the World Music requirement for undergraduate students in the College of Music.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2071 (2) Instrumentation

Introduces the instruments in the orchestra by studying their ranges, idioms, histories and performance practices. Assignments center around hands-on scoring for instruments. Student arrangements will be performed in class during the semester. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 2101 and MUSC 2121 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2081 (2) Prepared for the Soundcheck

Provides an overview of the recording process from the performer's perspective from soundcheck through final mastering. Uses recorded material from in-class sessions. Examines differing approaches to recording as well as current technologies.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 2860

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2091 (2) Recording Techniques

Provides hands-on training in various audio recording techniques, acoustics and sound reinforcement, studio maintenance and troubleshooting. Real-world experience is gained through individual recording projects and College of Music events.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 2870

Requisites: Requires prerequisite course of MUSC 2081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2101 (2) Semester 3 Theory

Continuation of MUSC 1111. Reviews harmonic and formal concepts from MUSC 1111. Introduces advanced chromatic concepts such as modal mixture, seventh chords with added dissonance, Neapolitan sixth chord and augmented-sixth chords. Explores in-depth structural analysis of musical works. Offered fall only.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2103 (3) Introduction to Music Education

Provides an overview of basic principles and practices of the music education profession. Explores public school music teaching through class discussions, directed observations, and a supervised field experience. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 2111 (2) Semester 4 Theory

Continuation of MUSC 2101. Builds on and synthesizes harmonic, melodic and formal concepts from semesters 1-3. Includes writing about musical structure and analyzing relationships of musical structure to extramusical elements (such as text, performance technique, dance, staging, etc.). Introduces 20th century compositional techniques. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2101 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2121 (1) Aural Skills Lab, Semester 3

Continuation of MUSC 1131. Applies concepts from MUSC 2101 in performance (prepared, from sight and improvised) and analytical listening (transcription, diction and aural analysis). Offered fall only.

Requisites: Requires prerequisite course of MUSC 1131 (minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2131 (1) Aural Skills Lab, Semester 4

Continuation of MUSC 2121. Applies concepts from MUSC 2111 in performance (prepared, from sight and improvised) and analytical listening (transcription, dictation and aural analysis. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2121 (minimum grade D-). Restricted to College of Music (MUSC) majors only.

Additional Information: Departmental Category: Theory and Composition

MUSC 2325 (2) Applied Harmony for the Keyboard

Provides an intensive study and application of the harmonic structure of music in a variety of keyboard skills: figured bass realization, chord progressions, harmonization, improvisation, transposition, on-sight harmonic analysis and playing by ear. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 1325 (all minimum grade D-). Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 2365 (2) Introduction to Accompanying

An overall study in the art of working with instrumentalists and singers including repertoire and orchestral reductions. Requires performance with a student instrumentalist or singer to be critiqued and coached by class and instructor. Offered spring only.

Requisites: Requires prerequisite course of MUSC 1325 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 2366 (2) Guitar Accompanying

Survey of accompanying repertoire for guitar with solo instruments (flute, violin, voice, etc.), including introductory work in basso continuo, playing/improvising from chord charts, and arranging accompaniments from musical scores.

Requisites: Requires prerequisite course of MUSC 1326 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 2608 (1) Alexander Technique

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5608

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 2772 (3) World Musics: Asia and Oceania

Highlights music in Asia and Oceania using current ethnomusicological materials.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2782 (3) World Musics: Africa, Europe, and the Americas

Use current ethnomusicological materials and methods in the study of music outside the Western art tradition. Usually taught in the spring, focuses on music cultures of Africa, Europe and the Americas.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 2918 (2) Building Your Music Career

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5918

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 2988 (1) Introduction to Music Research

Introduces music research tools and basic writing skills to provide information fluency and skills necessary for successful composition of formal music research papers. Applies curricular goals to specific topics of students' choice.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 2997 (1) Sophomore Proficiency

To be completed by the second semester of the sophomore year.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Theses and Recitals

MUSC 3013 (1) String Class

For music education majors with choral/general emphasis. Develops basic performance skills on two or more string instruments. Addresses teaching strategies and other specialized topics related to string instruction. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3023 (1) Woodwind Class

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3033 (1) Brass Class

For music education majors with choral or choral/general emphasis. Develops basic performance skills on two or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3051 (2) Beginning Composition

Covers issues relating to the craft of musical composition with analysis and writing in various styles. This introductory course is designed for music majors who are not composition majors. Some of the assignments will be read in class. Offered spring term of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3061 (2) Jazz Improvisation I

Develops skills in jazz improvisation through practical application of harmonic concepts, melodic construction, rhythmic awareness, transcription, repertoire and analysis. Open to all instruments. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite for non-jazz majors MUSC 2111.

Additional Information: Departmental Category: Theory and Composition

MUSC 3071 (2) Jazz Improvisation II

Continues and expands upon the material presented in MUSC 3061. Reinforcement of ability to create an improvised melody in a range of harmonic contexts including blues, bebop, modal jazz, free jazz, and other styles. Offered spring only.

Requisites: Requires prerequisite course of MUSC 3061 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3081 (3) Jazz Theory and Aural Foundations 1

Presents the grammar and syntax of jazz. Helps to gain a greater understanding of the inner workings and application of chord progressions as they relate to the jazz idiom including major key harmony, secondary dominants, modal interchange and modulation. Students will demonstrate their understanding of these components through written assignments, singing, aural recognition, transcription and keyboard demonstration.

Requisites: Requires prerequisite courses of MUSC 1111 and MUSC 1131 and MUSC 3071 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 3133 (2) Teaching General Music I

Provides an overview of general music teaching with emphasis on developmentally appropriate strategies and materials. Required for all music education majors as partial fulfillment of course work leading to K-12 music licensure. Offered spring only.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3153 (2) Teaching Woodwind Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more woodwind instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate woodwind instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3163 (2) Teaching String Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more string instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate string instruction. Offered fall only.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3176 (2) Conducting I

Introduces conducting and rehearsal techniques. Performance participation in the appropriate ensemble (band, choir or orchestra). Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 3186 (2) Conducting II

Introduces conducting and rehearsal techniques. Department enforced corequisite: performance participation in the appropriate ensemble (band, choir, or orchestra). Offered spring only.

Requisites: Requires prerequisite course of MUSC 3176 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 3193 (2) Vocal Pedagogy and Literature for Young Voices

Provides an overview of vocal anatomy/function, care of the voice, vocal repertoire, teaching strategies, and other specialized topics related to singing instruction in both private studio and public school choral settings. Fall section for instrumentalists; spring section for vocalists.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3223 (2) Teaching Brass Instruments

For music education majors with instrumental or instrumental/general emphasis. Develops basic performance skills on three or more brass instruments. Addresses teaching strategies and other specialized topics related to beginning and intermediate brass instruction. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3253 (2) Jazz Techniques for the Music Educator

Prepares the music educator for successful experiences teaching jazz at the secondary level. Students gain insights into performance and rehearsal techniques for the instrumental jazz ensemble. Explores approaches for teaching jazz theory, improvisation, and selecting literature for young students. Own instrument required for certain classes. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisites MUSC 1111 and MUSC 2103.

Additional Information: Departmental Category: Music Education

MUSC 3273 (2) String Pedagogy and Literature

Examines instructional methods/materials and pedagogical approaches appropriate for beginning to advanced string students in private studio, small ensemble, or large ensemble contexts. Topics may include group teaching strategies, as well as contemporary approaches including Rolland and Suzuki. Offered spring only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisites MUSC 2103 and MUSC 3163.

Additional Information: Departmental Category: Music Education

MUSC 3345 (2) Piano Pedagogy 1

Discusses teaching philosophies, objectives, and procedures. Examines and evaluates methods and materials. Studies practical aspects with which the private teacher is concerned. Offered fall of even-numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 3355 (2) Piano Pedagogy 2

Materials and techniques for teaching piano with a focus on the intermediate level student. Offered only in spring of odd-numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 3363 (2) Marching Band Techniques

Helps develop the skills needed to administer and teach all aspects of a contemporary high school marching band. Includes drill conception and design, instruction, organization, and administration. Offered fall only.

Requisites: Requires prerequisite course of MUSC 2103 and EMUS 1287 (all minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 3444 (1) French Diction

Designed for the understanding of lyric French diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of French classical vocal literature. Required of Junior BM voice majors.

Requisites: Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Recommended: Prerequisite MUSC 3464.

Additional Information: Departmental Category: Voice

MUSC 3464 (1) German Diction

Designed for the understanding of lyric German diction, the international phonetic alphabet, and its application to classical singing, as well as various musical styles of German classical vocal literature. Required of sophomore BM voice majors.

Requisites: Requires prerequisite course of MUSC 1554 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

MUSC 3642 (3) History of Jazz 1

Utilizing musical examples and analysis, this course studies the distinctly American art form of jazz music from its origins up to the 1950's, including the various traditions, practices, historical events and people most important to its evolution. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 3772 (3) West African Music and Culture in Ghana

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 3772

Requisites: Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

Additional Information: Departmental Category: Musicology

MUSC 3802 (3) History of Music 1

Surveys Western art music with stylistic analysis of representative works from all major periods through the Baroque. See also MUSC 3812.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 3812 (3) History of Music 2

Surveys Western art music with stylistic analysis of representative works from all major periods after the Baroque. See also MUSC 3802.

Requisites: Requires prerequisite course of MUSC 1111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Musicology

MUSC 3997 (1) Junior Recital

To be completed by the second semester of the junior year.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 2997. Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 4001 (2) New Musical Styles and Practices

Explores a variety of music from the 20th and 21st centuries beginning with Stravinsky and moving through current trends. Involves a mix an analysis/exploration of this music with short composition assignments imitating the different styles. Offered spring of odd-numbered years.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5011

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4012 and MUSC 5012

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the style. Offered fall only.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4031 (2) Jazz Arranging 1

Study of notation, score layout, transpositions, basic harmonic and melodic analysis, basic chord voicings, and composition for a small and large jazz ensemble. Use of notation software such as Finale or Sibelius. Offered fall semester only.

Requisites: Requires prerequisite course of MUSC 3091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4041 (2) Orchestration

Studies advanced orchestration techniques through score analysis and student projects. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 2071 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4061 (2) Tonal Analysis

Surveys tonal analytical techniques and forms of tonal music, including binary forms, ternary forms, rondo (and others) through study of selected works. Offered spring only.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4071 (2) Post-Tonal Theory and Analysis

Focuses on theory and analysis of post-tonal literature pre-1945. Offered fall of odd-numbered years.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5078

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite piano majors.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 4081 (3) Introduction to Music Technology

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

Equivalent - Duplicate Degree Credit Not Granted: MUEL 4081 and CMDP 3860

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4091 (2) Jazz Arranging 2

Continuation and expansion of studies in MUSC 4031. Survey and analysis of major composers and arrangers of the idiom. Course focuses on creating several arranging projects for a jazz ensembles. Offered spring of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 4031 (minimum grade D-). Restricted to College of Music undergraduate students only.

Recommended: Prerequisite MUSC 3081.

Additional Information: Departmental Category: Theory and Composition

MUSC 4101 (1-3) Theory and Aural Skills Review

Reviews tonal harmony, voice leading, and essential aural skills. Prepares graduate students for more advanced work in music theory. Students may register for aural skills only (1 credit), theory only (2 credits) or both theory and aural skills (3 credits). May not be taken pass/fail. Aural skills section offered fall and spring. Theory section offered spring.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4103 (1) Introduction to Student Teaching

Represents the first half of the professional internship year. Familiarizes students with the schools and music programs in which they plan to student teach. Music placements may consist of elementary and high school, elementary and middle school, or middle school and high school.

Requisites: Requires a prerequisite course of MUSC 4113 or MUSC 4313 or MUSC 4443 (minimum grade C-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4106 (2) Guitar Literature

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5106

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 4111 (2) Composing at the Computer

Discover strategies and techniques for generating and manipulating sound at the computer. Student projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia. Available to students without prior experience with computer music or composition. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.
Additional Information: Departmental Category: Theory and Composition

MUSC 4112 (3) Ethnomusicology

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4113 (3) Teaching General Music 2

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental and speech-based arrangements. Offered fall only.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSC) undergraduate students only.
Additional Information: Departmental Category: Music Education

MUSC 4121 (3) Topics in Music Technology

Exploration of issues, techniques, and tools of music technology. Topics vary from term to term and may include: interactive systems for performance; teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia, sound design and analysis. Lectures on work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 4081 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.
Additional Information: Departmental Category: Theory and Composition

MUSC 4122 (3) Music in Jewish Culture

Introduces students to a wide range of musical styles, traditions, genres, performers, composers, events and works that are part of Jewish culture, focusing on the twentieth and twenty-first centuries. Provides tools for understanding music on its own and in connection with issues of identity, diaspora, memory and liturgy. Includes opportunities for creative and critical engagement with Jewish music.

Equivalent - Duplicate Degree Credit Not Granted: JWST 4122

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 4133 (3) Student Teaching Practicum

Offers practice teaching under the guidance of a master music teacher.

Requisites: Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.
Additional Information: Departmental Category: Music Education

MUSC 4142 (3) American Indian Music

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5142

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4143 (2) Developing Children's Choirs

Examines the musical skills, teaching techniques and administrative procedures necessary for developing a children's choir. Offered fall term of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5143

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4151 (3) Topics in Music Analysis

Examines critically a specific topic or repertory, such as Song Analysis or Music of Brahms. Uses readings and analyses, with grades to be determined from reading responses, analytical assignments and writing. Offered fall of even-numbered years.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of MUSC 2111 and MUSC 2131 (all minimum grade B).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theory and Composition

MUSC 4152 (3) East Asian Music

Surveys the development of music in Japan, China and Korea through the in-depth study of particular styles of traditional music. The course emphasizes the study of music and culture, particularly music's relationship to religion, politics, language, literature, dance and theatre.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

Departmental Category: Asia Content

MUSC 4153 (1) Percussion Class and Pedagogy

Required of all music education majors. Presents knowledge and skills necessary for music educators to teach young students, including a general understanding of the techniques used in playing and teaching percussion instruments in the school music program. Offered fall only.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4163 (2) Choral Literature for School Ensembles

Examination of literature, materials, and methods appropriate for teaching choral music in secondary schools. Offered fall of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4168 (3) World Music Theories

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5168

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Recommended: Prerequisite MUSC 1802 or MUSC 2772 or MUSC 2782 or MUSC 4112.

Additional Information: Departmental Category: Theory and Composition

MUSC 4191 (2) Advanced Recording

Study of advanced recording techniques and concepts beyond those covered in MUSC 2091 involving multiple microphones for ensemble concerts and recording sessions within and outside of the College of Music. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 2091 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 4193 (1) Student Teaching Seminar

Required for all music student teachers. Addresses topics of concern to beginning teachers including classroom management, interpersonal skills, legal issues, job search strategies and capstone project development.

Requisites: Requires prerequisite course of MUSC 4103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4202 (3) Special Topic in Musicology: Current and Critical Issues

Examination of a specific topic of current or critical interest within areas of music history, ethnomusicology, critical theory and practice across the spectrum of Western, Popular and World Music traditions. Designed as a capstone course for music majors who have completed a full complement of musicology courses. Topics vary from term to term. Instructor consent is required for non-music majors.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Musicology

MUSC 4203 (1) Music Methods Practicum

Provides students with opportunities to observe and practice the use of various teaching techniques and relate them to concepts presented in the methods course. Students consult with the instructor to determine appropriate placements in schools.

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Requires corequisite course of MUSC 4313 or MUSC 4443. Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4255 (2) Service Playing Techniques

Study of church music for liturgical and non-liturgical denominations; includes hymn playing, anthem accompaniments, basics of conducting from the organ console and improvisation and selection of organ music appropriate to the requirements of the church year and other special services.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5255

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4285 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present. See also MUSC 4295.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5285

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4295 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present. See also MUSC 4285.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5295

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4313 (3) Teaching Choral Music

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5313

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 2103.

Additional Information: Departmental Category: Music Education

MUSC 4325 (2) Keyboard Literature 1

Surveys keyboard music from 1600 to 1830. Offered fall semester of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4335 (2) Keyboard Literature 2

Surveys keyboard music from 1830 to the present. Offered spring semester of even-numbered years.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4405 (2) Basso-Continuo Accompaniment

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5405

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 4443 (3) Teaching Instrumental Music

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5443

Requisites: Requires prerequisite course of MUSC 2103 (minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Education

MUSC 4583 (2) Inclusive Music Classroom

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5583

Requisites: Requires prerequisite courses of MUSC 2103 and MUSC 3133 (all minimum grade C-). Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 4113.

Additional Information: Departmental Category: Music Education

MUSC 4608 (1) Advanced Studies in the Alexander Technique

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 2608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5808

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 2608 (minimum grade C-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 4666 (3) Chamber Music Lit WW/Prc

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 4712 (3) Renaissance Music

Provides a repertory and analysis of polyphonic music, 1400-1600.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5712

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4752 (3) Women in Music

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5752

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4772 (3) History of Opera

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5772

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 or MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4802 (3) Studies in 20th Century Music

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5802

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4852 (3) 17th and Early 18th Century Music

Examines music and writings about music from the Baroque era.

Emphasizes cultural and musical analysis and surveys current musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5852

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3802 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4862 (3) African American Music

Examines the sacred and secular genres of Black American music from folk spirituals to contemporary gospel and hip-hop in their cultural and historical contexts. Examines individual composers and performers in specific historical contexts in order to understand the meanings behind certain Black musical stylistics, sound ideals and aesthetic preferences. Formerly MUSC 2802.

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4872 (3) Late 18th and 19th Century Music

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5872

Requisites: Requires prerequisite courses of MUSC 1802 and MUSC 3812 (all minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4892 (3) Latin American Music

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5892

Requisites: Requires prerequisite course of MUSC 1802 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

Additional Information: Departmental Category: Musicology

MUSC 4908 (1-3) Internship in Music Business

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5908

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4957 (1-4) Senior Thesis

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 4958 (2) Community Performances

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5958

Requisites: Requires prerequisite course of MUSC 2918 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4978 (3) Arts Administration & Management

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5978

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4988 (3) The Entrepreneurial Artist

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 5988

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Recommended: Prerequisite MUSC 2918.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 4997 (1) Senior Recital

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite class of MUSC 3997 (minimum grade D-). Restricted to College of Music undergraduate students only.

Additional Information: Departmental Category: Theses and Recitals

MUSC 5002 (3) Proseminar in Historical Musicology

Prepares students to pursue independent research in the history of music. Meeting as a seminar, the course focuses on the nature of evidence, methods and tools of research, and theoretical or historiographic issues.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5011 (2) 16th Century Counterpoint

Provides a stylistic study of the main contrapuntal genres of the period including free, two- and three-part imitative counterpoint in the style of Palestrina. Provides a foundation in species counterpoint, working towards free counterpoint; stresses composing in 16th century styles. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4011

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5012 (3) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4012 and MUEL 4012

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5021 (2) 18th Century Counterpoint

Provides a stylistic study of main contrapuntal genres of the period including inventions, suite movements and fugues. Provides a foundation in species counterpoint; stresses analysis and composing in the styles. Offered fall terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5026 (2) Percussion Literature

In-depth investigation of major original solo works for percussion, significant ensemble literature including chamber and large ensembles, and selected transcriptions. Instructor consent required.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5036 (2) Brass Literature

Investigates major original solo works for trumpet, horn, trombone, euphonium, and tuba, and ensemble literature including chamber and large settings. Offered every other spring term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5041 (2) Advanced Orchestration

Provides an advanced study of orchestration techniques through score analysis and student projects. Offered spring of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5061 (3) Advanced Tonal Analysis

Surveys tonal repertory and analytical techniques. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5071 (3) Post-tonal Theory and Analysis I

Focuses on theory and analysis of post-tonal literature pre-1945. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5078 (1) Piano Technician for Pianists

Familiarizes pianists with the development of the modern grand piano, its construction and the proper terminology of parts and specifications. Trains pianists in minor repairs and adjustments of the grand piano action and in minor tuning tasks.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4078

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite piano majors.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5081 (3) Applications in Music Technology

Presents advanced strategies for applying computer technology in music creation. Synthesis, DSP, MIDI and audio sequencing, as well as advanced music engraving, will be explored through the use of various software platforms including Logic, Reason, MAX and Finale. Offered fall term only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5091 (3) Contemporary Theory - Jazz and Modal Music

Studies the composition and improvisation of Herbie Hancock, Wayne Shorter, Chick Corea and their contemporaries. Broadly examines modality in jazz and its similarities to music of Ravel and Debussy, as well as systems of organization in Messiaen and others. Strategies for analysis and integration of the material into a personal vocabulary as a composer and improviser are explored. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 3081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5103 (3) Teaching General Music

Provides an in-depth examination of teaching and learning processes in the elementary general music classroom, based on the integration of child development and musical development theories with content and delivery skills appropriate for K-5 general music classrooms. Students implement and evaluate music instruction, design curricular projects, and build a repertoire of vocal, instrumental, and speech-based arrangements. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5106 (2) Guitar Literature

An analytical and historical survey of the repertory of the guitar and its antecedents from the renaissance to the present day.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4106

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5112 (3) Proseminar in Ethnomusicology

Examines the definition, scope, and methods of ethnomusicology, the discipline that focuses on approaches to the study of music theory, history, and performance practices of world cultures.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5121 (3) Advanced Topics in Music Technology

Conducts advanced research in techniques and tools of music technology. Topics vary from term to term and may include: user interfaces for computer music; advanced sound design; digital modeling of acoustic sounds; computer-aided analysis of sound; modeling music intelligence in real time. Lectures and work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 5081 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5136 (2) Advanced Conducting

Offers advanced work in conducting.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5138 (2) Advanced Choral Conducting

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5142 (3) American Indian Music

Examines Native North American musical cultures, emphasizing music as an integral part of religious expression and community life.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4142

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5143 (2) Developing Children's Choirs

Examines the musical skills, teaching techniques and administrative procedures necessary for developing a children's choir. Offered fall term of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4143

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5151 (3) Topics in Music Analysis

Analytical study of a specific topic to be determined by the instructor (e.g., German Lieder, Bartok quartets, tonal rhythm, Schenker, etc). Study published analyses representing a variety of methodologies and produce original analyses. Student must have passed graduate preliminary exams or completed remediation before enrolling in this course.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5061 or MUSC 5071 as appropriate to the topic, or instructor consent required.

Additional Information: Departmental Category: Theory and Composition

MUSC 5156 (2) Symposium in Choral Music

Provides an advanced study of choral repertoire by style period. Required of all choral graduate students for a minimum of two semesters.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5168 (3) World Music Theories

Examines music rules, concepts or music theories and sociocultural elements that musicians use in creating musical sound, with emphasis on music practices from a variety of world traditions; observing shared and diverging principles, making cross-cultural comparisons and developing a new pedagogy that supports the substantive study of global musics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4168

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 5183 (2) Research in Music Teaching

Introduces basic descriptive, experimental, and qualitative research methods, including sampling, design, data collection, and analysis. Students review published music research and conduct one original research study. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5203 (2) Topics in Music Education

Provides an in-depth examination of contemporary topics in music education. Students implement and design relevant projects.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5215 (1-2) Studies in Piano Teaching

Studies the practical aspects and techniques for teaching piano at the intermediate and advanced levels in pre-college and college settings, as well as teaching group piano at the college level.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisites: MUSC 5305 and MUSC 5315.

Additional Information: Departmental Category: Keyboard

MUSC 5246 (3) Jazz Improvisation and Analysis

Application of performance skills for the advanced improviser through specific harmonic, melodic and rhythmic techniques. Includes analysis of transcriptions and varied harmonic contexts as well as a focus on the development of repertoire. Offered fall semester of odd-numbered years.

Requisites: Requires prerequisite course of MUSC 3071 (minimum grade D-). Restricted to Music (MUSC) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5255 (2) Service Playing Techniques

Study of church music for liturgical and non-liturgical denominations; includes hymn playing, anthem accompaniments, basics of conducting from the organ console and improvisation and selection of organ music appropriate to the requirements of the church year and other special services.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4255

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5256 (3) Jazz Studies Administration and Pedagogy

Surveys approaches, techniques, philosophies and materials available for teaching jazz at both pre-college and collegiate level. Subject areas covered include improvisation, composition and arranging, studio teaching and directing ensembles. Studies the organization and administration of collegiate jazz programs. Topic include curriculum, program philosophy, teaching techniques, funding, teacher training and evaluation. Offered fall terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 3253.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5273 (2) Comprehensive String Pedagogy

Comparative study and application of the principles of string teaching. In-depth analysis of individual instrument pedagogy and application to advanced studio and class teaching. Historical survey of major violin, viola, cello, and double bass pedagogues. Includes apprenticeship teaching. Offered fall of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5285 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4285

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5295 (3) Organ Survey

Survey of organ repertoire and the history of organ building from the 16th century to the present.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4295

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5305 (2) Piano Pedagogy Group Techniques

Discusses materials and techniques for teaching beginning piano students of various ages in studio and class settings. Special attention given to adult classes. Includes an introduction to educational technology used in group instruction. Offered fall of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5313 (3) Teaching Choral Music

Examines choral music curricula, instructional materials and teaching techniques appropriate for secondary choral settings. Also addresses administrative strategies for choral music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4313

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5315 (2) Piano Pedagogy: Intermediate Literature

Surveys repertoire at the intermediate level and discusses teaching techniques. Explores issues related to intermediate and advanced piano performance, such as performance anxiety, physical and psychological well-being of the performer, and the development of technique. Introduces educational technology relevant to intermediate teaching. Offered spring of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5325 (2) Keyboard Literature 1

Examines areas of style, genre, and performance practice in selected keyboard music from 1600 to 1830. Emphasizes student presentation of specific topic areas. Offered fall terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5335 (2) Keyboard Literature 2

Examines areas of style, genre, and performance practice in selected areas of keyboard music from 1830 to the present. Emphasizes student presentation of specific topic areas. Offered spring terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5336 (2) Brass Pedagogy

Analyzes pedagogical techniques and philosophies of teaching brass instruments, and examines materials. Offered every other spring terms.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5345 (2) Research: Piano Literature and Pedagogy

Looks at individual or group research related to piano pedagogy or literature for piano.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5346 (3) Woodwind Pedagogy

Provides the knowledge and skills to teach woodwind instruments in both individual studio and collegiate class settings. Considers pedagogical techniques for all levels of instruction. Offered fall terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5356 (2) Jazz Studies Practicum

Implements independent, project-based studies for further developing knowledge and experience in jazz pedagogy, performance and composition. Student is assessed and guided by faculty to develop specific skills needed toward becoming a more effective jazz educator. Offered spring of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5256.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5365 (2) Advanced Accompanying

An in-depth study of collaborative repertoire in individually assigned projects, coached by collaborative piano faculty and others.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5375 (2) Opera Coaching for Pianists

Teaches skills for opera coaches and rehearsal pianists.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5405 (2) Basso-Continuo Accompaniment

Studies the history, theory and practice of Basso-continuo accompaniment. Provides practical instruction in realizing harmony from a given bass line (figured or unfigured), projecting affect and creating dynamics at the harpsichord. Emphasizes individual cognition and creativity. Offered fall term only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4405

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5425 (2) Collaborative Literature for Piano with Winds, Brass, and Percussion

Study of all forms of wind, brass and percussion repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required.

Offered fall terms of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5435 (2) Collaborative Literature for Piano with Strings

Study of all forms string repertoire involving collaboration with piano including sonatas, duos, short pieces and concerti. Collaborative piano major or instructor consent required. Offered spring terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 5443 (3) Teaching Instrumental Music

Examines instrumental music curricula, instructional materials and teaching techniques appropriate for rehearsal, class, and lesson settings. Also addresses administration strategies for instrumental music programs. Offered spring only.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4443

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5444 (2) Vocal Pedagogy

In depth study of the physiology, acoustics, and health aspects of the singing voice. Recommended for all graduate students in voice.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5454 (2) Repertory for Young Voices

Survey of the solo repertoire for young voices, the physiological aspects of mutational voices, techniques of vocalizing young voices, and class voice procedure.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5464 (2) French Song Literature

Provides an extensive analytical and historical discussion of French song literature styles, from the 12th century to the present.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5484 (2) Graduate Seminar in Vocal Pedagogy

A thorough investigation of the challenges of studio voice pedagogy, including corrective techniques, psychological philosophies, and video analysis of student teaching. Examination and evaluation of comparative methodologies of vocal technique.

Requisites: Requires prerequisite course of MUSC 5444 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5564 (2) German Song Literature

Provides an extensive analytical and historical discussion of German song literature styles, from the 18th century to the present. Offered fall terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

MUSC 5583 (2) Inclusive Music Classroom

Surveys strategies necessary for teaching music to all students, including those with special needs. Offered fall of even-numbered years.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4583

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 5608 (1) Graduate Studies in the Alexander Technique

Investigates the discoveries and writings of F. M. Alexander regarding kinesthetic perception, physical coordination and mind-body awareness. Applies these contexts to specific musical activities. Analysis and research regarding Alexander's principles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2608

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5642 (3) Jazz History and Literature

Studies musical trends and cultural forces influencing jazz, with analysis of improvisational styles, melodic and motivic variations, transcriptions and orchestrations from significant periods in its history. Offered spring terms only.

Requisites: Requires prerequisite course of MUSC 3642 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5666 (2) Chamber Music Literature: Woodwinds

Provides a stylistic-historical survey in various genres from Baroque era to present. Offered fall terms of even numbered years.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 5708 (2) Introduction to Music Bibliography and Research

Explores basic informational sources about music and musicians; a study of citation formats, research methodologies and writing techniques employed in music research papers, theses and dissertations. Intended to increase students' information fluency. Required in all master's degree programs.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5712 (3) Renaissance Music

Provides a repertoire and analysis of polyphonic music, 1400-1600.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4712

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5722 (1) Sight-Reading Medieval and Renaissance Music Literature

Provides an opportunity to read through, sing, play, study and discuss ancient repertoires more intensively than is normally possible in music history lecture classes, seminars or chamber music ensembles. Evaluation is based on active participation, out-of-class research and final in-class group performance projects. Recommended for graduate students in historical musicology and choral conducting.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5742 (3) Performance Practice of Early Music

Examines instrumental and vocal performance practices through the 18th century. Topics may vary from year to year.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5752 (3) Women in Music

Examines the role of women as creators and performers of Western Music. Explores related issues in musicology, including canon formation, reception history and feminist aesthetics.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4752

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5762 (3-4) History of Choral Literature

Provides a seminar in analysis of musical style and history of choral repertoire. Those wishing review of literature and repertoire may enroll for 4 credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5772 (3) History of Opera

Examines representative operas from the 17th through the 21st centuries. Emphasizes both cultural and analytical aspects and surveys related musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4772

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5802 (3) Studies in 20th Century Music

Offers intensified work in history of music in the 20th century. Topics vary from year to year.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4802

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5808 (1) Advanced Alexander Technique for Graduate Students

Continues investigation of the benefits of Alexander's principles regarding mind-body awareness begun in MUSC 5608. Increased emphasis on utilizing principles in specialized activity. Analysis and research regarding musical activities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4608

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Requires prerequisite course of MUSC 5608 (minimum grade C-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 5822 (3) Ancient and Medieval Music

Surveys sources from the ancient Greeks to the early Christian era and music from the 8th to the 14th century.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5832 (3) Studies in American Music

Offers intensified work in folk, popular, and art music of the United States.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5842 (3) Aesthetics of Music

Surveys various philosophies of music in writings of philosophers, psychologists, sociologists, composers, critics and historians.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5852 (3) 17th and Early 18th Century Music

Examines music and writings about music from the Baroque era. Emphasizes cultural and musical analysis and surveys current musicological literature.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4852

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5872 (3) Late 18th and 19th Century Music

Studies European and American music from the last developments of the styles through romanticism and its later 19th century reverberations.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4872

Repeatable: Repeatable for up to 12.00 total credit hours.

Recommended: Prerequisite or corequisite MUSC 3812.

Additional Information: Departmental Category: Musicology

MUSC 5882 (3) Studies in 18th and 19th Century Music

Meets as a seminar and examines selected topics in Classic and Romantic music, 1750-1900. Topics vary from year to year.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5892 (3) Latin American Music

Explores music of cultures of the Americas south of the United States and in the diaspora, emphasizing the relationships of music and culture in folk, popular and arts styles.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4892

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 5908 (1-3) Internship in Music Business

Engage with music/music business organizations in the community (for profit or non-profit) to pursue specific tasks or projects relevant to the student's career goals. A minimum of 48 hours is required per semester for one credit.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4908

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5918 (2) Building Your Music Career

Develop a broad range of tools needed for a professional career in music. Topics include networking, development and use of promotional materials, funding, social media and the internet and financial management, among others - all taught through an entrepreneurial lens. A range of career opportunities is explored, using the entrepreneurial process to assess and explore a variety of paths and opportunities.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 2918

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5938 (3) Management and Leadership in the Arts

Presents leadership theories and management principles and their application to arts organizations. Examines concepts and approaches for leaders of small, medium and large arts organizations in both the for-profit and nonprofit sectors, including human resource management and effective communication.

Grading Basis: Letter Grade

MUSC 5948 (3) Sustainable Arts Organizations: Forecasting and Fundraising

Equips students to create comprehensive fundraising plans rooted in strategic business planning for arts organizations, which depend on contributed income for sustainability. Students will learn the basics of planning, budgeting and forecasting, along with proven, effective fundraising strategies and techniques. Includes case studies and guest speakers with extensive professional expertise in the field.

Grading Basis: Letter Grade

MUSC 5958 (2) Community Performances

Explore the real-world issues of planning and presenting concerts. Learn to program music for all types of audiences, gain confidence speaking about your music and handle the logistics of concert production. Discuss the role of concerts in the 21st century and examine new styles of presentation, audience engagement and outreach. Course culminates in a concert presented in a local venue.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4958

Requisites: Requires prerequisite course of MUSC 5918 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5968 (2) Entrepreneurial Ventures in the Arts

Prepares students to evaluate opportunities in their specific arts field by analyzing existing arts organizations and then applying entrepreneurial concepts to create new enterprises. Topics for research and discussion include current issues in the arts, introduction to entrepreneurship, preparing a business feasibility study, market information for new ventures and funding sources.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5978 (3) Arts Administration & Management

Introduce students to current trends in arts administration, explore the fundamentals of managing arts organizations and develop concrete tools for managing boards, volunteers and staff, effective fund raising, strategic planning and program development. Current issues, the role of the arts and arts advocacy will be discussed.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4978

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 5988 (3) The Entrepreneurial Artist

Learn the core principles of entrepreneurship, such as idea formation, venture models, opportunity assessment, market analysis and strategies for launching a venture and apply them to entrepreneurial ideas. Lectures, projects, entrepreneur interviews and case studies will culminate in a feasibility study for an original entrepreneurial concept.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4988

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 5918.

Additional Information: Departmental Category: Music Entrepreneurship

MUSC 6041 (3) Orchestration since 1940

Studies significant and distinctive orchestration techniques of the 20th century and 21st centuries. Offered spring of even-numbered years.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6051 (3) Pedagogy of Music Theory

Explores methods, materials, practical techniques for teaching undergraduate music theory, aural skills and analysis. Student must have passed general written theory and aural skills preliminary exam or completed remediation before enrolling in course. Offered spring of odd-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6113 (2) Foundations of Music Education

Surveys historical and philosophical bases of contemporary music education. Offered fall only.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6133 (2) Comprehensive Musicianship through Performance

Explores curricular models for music education. Emphasizes comprehensive musicianship and standards-based frameworks for curriculum and development. Offered spring terms of even-numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6193 (1-3) Selected Studies in Music Education

Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Music (MUSD) or Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 6203 (2) Psychology of Music Learning

Provides an overview of psychological concepts relevant to music teaching and learning. Topics include learning theories, selected individual difference variables (motivation, anxiety, creativity, and personality), physiological structures related to hearing, psychoacoustics, and approaches to examining musical ability (e.g. brain research, music aptitude, and skill acquisition). Offered spring terms only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6213 (2) Assessment of Music Learning

Provides an overview of traditional and contemporary approaches to music assessment. Topics include psychometrics, standardized tests, test construction, grade reports, and student portfolios. Offered on a rotating basis during summer session.

Requisites: Restricted to Music Education (MMED-MMUE) graduate students only.

Additional Information: Departmental Category: Music Education

MUSC 6223 (2) Sociology of Music Education

Studies sociological perspectives related to music education. Topics include functions and uses of music; teacher and student role/identity development; social aspects of music performance, and cultural perspectives on music learning. Offered fall of even-numbered years.

Requisites: Restricted to Music (MUSD) or Music Education (MMED or MUED) graduate students only.

Recommended: Prerequisite MUSC 6113.

Additional Information: Departmental Category: Music Education

MUSC 6233 (2) Pedagogy of Music Teaching and Learning

Explores four topics (reflective/critical thinking, teacher effectiveness, cultural/program contexts, teachers' lives/career development) relevant to long-term teacher development. Includes individualized feedback on teaching. Open to graduate students in music education and performance-pedagogy. Offered spring terms of odd numbered years.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite MUSC 6113 and/or significant teaching experience.

Additional Information: Departmental Category: Music Education

MUSC 6243 (1) Applications of Music Pedagogy

Provides a structured, collaborative environment for graduate students with K-12 teaching duties to apply the content from music education courses to their current pedagogical environments. Students will apply inquiry strategies as they design and implement an applied project that synthesizes specific theoretical or conceptual areas. Offered fall term only.

Repeatable: Repeatable for up to 2.00 total credit hours.

Requisites: Restricted to Music Education (MMED-MMUE) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Music Education

MUSC 6325 (2) Seminar in Piano Literature

Provides an intensive study of a selected area of repertoire or history. Offered fall terms only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Keyboard

MUSC 6801 (3) Advanced Topics in Music Theory

Intensive study of a specialized topics in theory and analysis through critical reading and analysis, class presentations and independent research. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 6822 (3) Advanced Studies in Musicology

Intensive study of a specialized topic in musicology. Students will be guided in critical reading, historical or ethnographic issues, analysis, oral presentations, and independent research.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of MUSC 5708 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Musicology

MUSC 6948 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Theses and Recitals

MUSC 7046 (3) Seminar in Jazz Literature

Provides advanced study in jazz literature and styles. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires class presentations and a major paper or project. Offered spring semester only.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Recommended: Prerequisites MUSC 5091 and MUSC 5642.

Additional Information: Departmental Category: Choral and Instrumental Music

MUSC 7103 (3) Historical Research in Music Education

Topics include oral history, archival collections, data verification, and critiquing/publishing research. Students conduct one original research study. Offered spring of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) doctoral students only.

Additional Information: Departmental Category: Music Education

MUSC 7113 (3) Quantitative Research in Music Education

Topics include sampling, questionnaire development, research design, intermediate and advanced statistics, presenting/publishing research, and research ethics. Students conduct an original research study. Offered fall of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7138 (3) Contemporary Issues in College Teaching

Examines music teaching within colleges and universities, including the evolution of university music programs, undergraduate and graduate music curricula, music professors and their work, and sociopolitical issues. Offered spring of odd-numbered terms.

Requisites: Restricted to College of Music (MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Interdepartmental Courses

MUSC 7143 (3) Qualitative Research in Music Education

Topics include qualitative research traditions, site and participant selection, data collection and analysis methods, quality standards, and research ethics. Students conduct an original research study. Offered fall of odd-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7203 (3) Doctoral Seminar in Music Education

Provides an advanced study of topics central to the music education profession. Requires class presentations and a major paper or project. Offered fall of even-numbered years.

Requisites: Restricted to Music Education (MMED-MMUE) students only.

Additional Information: Departmental Category: Music Education

MUSC 7801 (3) Doctoral Seminar in Music Theory

Provides advanced study in theory. Students present results of research on individually chosen topics or aspects of a topic central to the class. Requires a major paper or project. Student must have passed graduate preliminary exams and completed 6 credits hours of graduate-level theory before enrolling in course. Instructor determined prerequisite will be enforced as appropriate to the topic.

Requisites: Requires a prerequisite course of MUSC 5708 (minimum grade D-). Restricted to College of Music (MUED or MUSD) graduate students only.

Additional Information: Departmental Category: Theory and Composition

MUSC 7822 (3) Seminar in Musicology

Required of all musicology majors before completion of comprehensive examinations. A different research area is designated each semester. See also MUSC 7832. Offered fall only.

Requisites: Restricted to Music (MUSD) graduate students only.

Additional Information: Departmental Category: Musicology

Music Electives (MUEL)

Courses

MUEL 1081 (3) Basic Music Theory

Introduction to music notation, meter and rhythm, scales, intervals, triads, seventh chords, fundamentals of harmonic progression, voice leading, aural skills and composition. For nonmusic majors who have little or no previous background in the subject.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 1115 (1) Piano Class I

Introduces the keyboard and music reading for nonmusic majors with no prior keyboard experience. Studies very easy classical and pop repertoire. No prior keyboard experience or instructor consent required.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 1125 (1) Piano Class II

Continuation of MUEL 1115. Focuses on development of music reading. Studies technical patterns, easy classical and pop repertoire, and improvisation.

Requisites: Requires prerequisite course of MUEL 1115 (minimum grade D-). College of Music (MUSCU) majors are excluded from this course.

MUEL 1145 (2-4) Guitar Class

A systematic study of the beginning literature and technique of the classical guitar with an emphasis on reading music. Designed for nonmusic majors with no prior musical experience.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 1155 (2) Intermediate Guitar

Studies the intermediate literature and technique of the classical and popular guitar. Emphasis on reading standard notation and chord charts. Designed for non- music majors.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of MUEL 1145 (minimum grade D-). College of Music (MUSCU) majors are excluded from this course.

MUEL 1184 (1) Voice Class

Involves basic vocal technique and easy solo repertoire taught through a group medium, for beginner and intermediate level students. May be repeated upto 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: College of Music (MUSC) majors are excluded from this course.

Recommended: Requisite ability to read music.

MUEL 1416 (2) Introduction to Hand Percussion

Studies the literature and technique of hand percussion. Emphasizes African and Latin percussion techniques. Designed for non-music majors.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 1832 (3) Appreciation of Music

Introduces music, including the fundamental elements of music, the history of the Western tradition and its composers, the development of American popular music and aspects of World Music.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr. Literature and the Arts

MUEL 2051 (3) Introduction to Songwriting Techniques

Introduce students to the art and craft of songwriting through (1) the analysis of great songs past and present (2) creative work (3) experimentation (4) collaboration (5) performance and possibly recording. We will examine form, melody, harmony, rhythm, lyric writing (i.e. points of view, logic, use of literary device, etc.), solo and collaborative ensemble performance, style and poise.

Requisites: College of Music (MUSC) majors are excluded from this course.

Grading Basis: Letter Grade

MUEL 2091 (2) Intro to Audio Recording

Introduces and explores basic concepts in audio recording from microphones to digital audio workstations. Also focuses on development of critical listening skills.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 2184 (1) Voice Class

Continuation of MUEL 1184, with more advanced repertoire and vocal techniques.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of MUEL 1184 (minimum grade D-). College of Music (MUSCU) majors are excluded from this course.

MUEL 2752 (3) Music in American Culture

Offers a stylistic and historical examination of trends that have influenced present-day music in the U.S.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr. United States Context

MUEL 2762 (3) Topics in Music and Drama

Explores techniques used in combining music and dramatic arts, exploring a range of examples from musical and dramatic literature of the West or other world regions from circa 1000 to present. Specific course topics could cover any or all of these styles. Offered spring only.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr. Literature and the Arts

MUEL 2772 (3) World Musics: Asia and Oceania

Highlight music in Asia and Oceania using current ethnomusicological materials.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr. Human Diversity

MUEL 2782 (3) World Music: Africa, Europe, and the Americas

Highlights music in Africa, Europe and the Americas using current ethnomusicological materials.

Requisites: College of Music (MUSC) majors are excluded from this course.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr. Human Diversity

MUEL 2842 (3) American Musical Theatre

Provides an overview of the role of musical theatre in U.S. culture, emphasizing the 20th century Broadway musical.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 2852 (3) Music of the Rock Era

Examines popular music, concentrating on the U.S. after 1950. Considers precursor styles (e.g., blues folk) and contributions to the new rock style; discusses the evolution of rock style from 1960 through the 1990s. Offered spring only.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

MUEL 2862 (3) American Film Musical

Examines the development of filmed musicals from the beginning of sound movies through the Golden Age of Musicals. Emphasizes analysis and relationships of characters, songs, and incidental music.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

MUEL 2872 (3) Music in the Rock Era: Special Topics in Heavy Metal

Explores, discuss, debate and develop deeper understanding of Heavy Metal. Included are study of musical style characteristics and lyrical content, innovative performers, unifying elements of Heavy Metal culture and the diversity within it, and its role in the larger Rock and societal contexts. Issues of gender, religion, and sexuality in the Heavy Metal construct are also discussed.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 3051 (2) Basic Composition

Introduces the processes, materials, and forms of composition through the writing and performance of short musical works. Open to any student who already has rudimentary musical knowledge.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 3642 (3) History of Jazz

Surveys the distinctly American art form of jazz music from its origins to the present, including the various traditions, practices, historical events and people most important to its evolution. Offered fall and spring.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 3772 (3) West African Music and Culture in Ghana

Provides hands-on and experiential enrichment for students to interact at several levels with a local community in Ghana. Classroom lectures will be combined with direct participation in drumming and dancing, field trips to participate in festivals and court ceremonies, field trips to kente weaving village, adinkra cloth making, wood carving villages, and museums.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 3772

Requisites: Requires prerequisite courses of MUSC 2782 and MUEL 2772 (all minimum grade D-). Restricted to students with 27-56 credits (Sophomore) non-College of Music majors only.

MUEL 3822 (3) Words and Music

Explores the interaction between words and music in song. Students will consider how such features as rhyme, rhythm, tone, and the connotations of particular words contribute to meaning in poetry; how rhythm, tempo, dynamics, mood, and instrumentation contribute to meaning in music; and how words and music coalesce in song to make a new meaning.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

MUEL 3832 (3) Music in Literature

Addresses literature that seeks either to explore the meaning of music or to make music out of words. Students will consider how musical concepts and techniques can be incorporated into poetry and prose, and will analyze the roles that writers have attributed to music in society, politics, and the life of the individual.

Requisites: College of Music (MUSC) majors are excluded from this course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

MUEL 3862 (3) Music and Global Health

Explores the ways in which music relates to health in different cultures including: Western art and popular music; ritual healings in Africa, Asia and Native and South America peoples; in relation to contemporary global health challenges.

Requisites: College of Music (MUSC) majors are excluded from this course.

Grading Basis: Letter Grade

MUEL 3872 (3) Music in the Rock Era: Special Topics in Heavy Metal

Explore, discuss, debate and develop deeper understanding of Heavy metal. Included are study of musical style characteristics and lyrical content, innovative performers, unifying elements of Heavy Metal culture and the diversity within it, and its role in the larger Rock and societal contexts. Issues of gender, religion, and sexuality in the Heavy Metal construct area also discussed.

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 3882 (3) Music and Violence

Explores the role of music in generating, sustaining and contesting acts of violence. Focuses on conflicts occurring throughout the globe during the late 20th and early 21st centuries, with case studies that treat terrorism, warfare, revolution, street violence, domestic abuse, reconciliation and peace. Helps students to build an understanding of music's motivational powers and the nature of violence, as well as the role of expressive culture in mediating social conflict more generally.

Requisites: College of Music (MUSC) majors are excluded from this course.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Contemporary Societies

MUEL 3892 (3) Music and Space

Explores the ways that outer space inspires and is portrayed in musical sound. Introduces literature and media from historical musicology, ethnomusicology, music theory, anthropology, physics, geography and planetary science, with case studies ranging from Ancient Greece, to classic and modern Western art music, to contemporary popular music.

Requisites: College of Music (MUSC) majors are excluded from this course.

Grading Basis: Letter Grade

MUEL 4012 (3-6) African Music

Studies music cultures of Africa and the Black Diaspora, including folk and art music traditions, religious and popular music genres. Specific course topics could cover any or all of these styles, including exploring interconnections of musical stylistics of Africa and the Black Diaspora.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4012 and MUSC 5012

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 4081 (3) Introduction to Music Technology

Surveys the various tools and techniques in the field of music technology. Topics include an introduction to basic synthesis, digital signal processing, MIDI and audio sequencing, music notation and a historical perspective on electronic music.

Equivalent - Duplicate Degree Credit Not Granted: MUSC 4081 and CMDP 3860

Requisites: College of Music (MUSC) majors are excluded from this course.

MUEL 4111 (2) Computer Composition

Learn strategies and techniques for generating and manipulating sound with computer-specific tools. Students' projects will include compositions, soundscapes, ambient environments and soundtracks for multimedia and performance projects.

Equivalent - Duplicate Degree Credit Not Granted: CMDP 4860

Requisites: Requires prerequisite course of CMDP 3860 or MUEL 4081 (minimum grade D-).

Grading Basis: Letter Grade

MUEL 4121 (3) Topics in Music Technology

Exploration of issues, techniques and tools of music technology. Topics vary from term to term and may include: interactive system for performance, teaching and learning; computer music instrument design; digital synthesis and signal processing; music in intermedia; sound design and analysis. Lectures and work sessions will support student projects.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of MUEL 4081 (minimum grade D-). College of Music (MUSC) majors are excluded from this course.

Music Ensemble (EMUS)

Courses

EMUS 1217 (1) University Singers

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1227 (1) University Choir

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1237 (1) Women's Chorus

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1247 (1) Men's Chorus

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1257 (1) Collegiate Chorale

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1267 (1) Choirs/Festival

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1277 (1) Court Players

Repeatable: Repeatable for up to 12.00 total credit hours.

EMUS 1287 (1) Marching Band

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1297 (1) Wind Symphony

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1307 (1) Symphonic Band

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3307

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1317 (1) Concert Band

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3317

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1327 (1) Symphony Orchestra

2.0 hours offered CE Aspen Music School only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1337 (1) Chamber Orchestra

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1347 (1) Bell Ensemble

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1357 (1) Harp Ensemble

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1367 (1) Early Music Ensembles

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1377 (1) Chamber Music-Brass

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1387 (1) Chamber Music-Strings

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1397 (1) Chamber Music Piano Duo

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1407 (1) Chamber Music-Woodwinds

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1417 (1) Percussion Ensemble

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1427 (1) Jazz Ensemble

Students perform in a principal format for jazz expression. The large ensemble setting affords the opportunity to expand knowledge of jazz styles and repertoire as well as refine reading skills and improve spontaneous interaction with other musicians. Placed through auditions held at the beginning of search semester.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3427 and EMUS 5427

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1437 (1) Jazz Combo

Allows students the opportunity to perform in the principal format for jazz expression. The small group setting affords performers the opportunity to refine improvisation skills, improve spontaneous interaction with musicians and expand knowledge of jazz styles and repertoire. Placed through auditions held at the beginning of each semester.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3427 and EMUS 5437

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1447 (1) Guitar Ensemble

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1457 (1) Electronic Music Ensemble

Explores performance, composition and the history of electronic music, including 20th century art music on through to electronic music in contemporary popular culture.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3457 and EMUS 5457

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1467 (1) World Music Ensemble

Study and performance of musics of diverse cultures in the United States, including Native American, Latin American, African American and Asian American, as well as music from the mother cultures of these groups.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3467 and EMUS 5467

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 1477 (1) Chamber Choir

Study and performance of various vocal styles, including madrigals and vocal jazz, investigation of the challenges of music making in a small group choral setting.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3477 and EMUS 5477

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Grading Basis: Letter Grade

EMUS 1507 (1) Chamber Music

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) College of Music (MUSC) majors only.

EMUS 1517 (1) Campus Orchestra

Offers University string, wind and percussion performers not majoring in music an opportunity to play in a conducted orchestra. Rehearsals are one night per week and has limited performance demands. Auditions are not required for strings. Instruments are available if needed.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 3517

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

EMUS 3217 (1) University Singers

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3227 (1) University Choir

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3237 (1) Women's Chorus

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3247 (1) Men's Chorus

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3257 (1) Collegiate Chorale

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3267 (1) Choirs/Festival

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3287 (1) Marching Band

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3297 (1) Wind Symphony

2.0 credit hours offered CE Aspen Music School only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 3307 (1) Symphonic Band**Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1307**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3317 (1) Concert Band****Equivalent - Duplicate Degree Credit Not Granted:** EMUS 1317**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3327 (1) Symphony Orchestra**

2.0 hours offered CE Aspen Music School only.

Repeatable: Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3337 (1) Chamber Orchestra****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3347 (1) Bell Ensemble****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3357 (1) Harp Ensemble****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3367 (1) Early Music Ensembles****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3377 (1) Chamber Music-Brass****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3387 (1) Chamber Music-Strings****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3397 (1) Chamber Music Piano Duo****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3407 (1) Chamber Music-Woodwinds****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3417 (1) Percussion Ensemble****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3427 (1) Jazz Ensemble**

Students perform in a principal format for jazz expression. The large ensemble setting affords the opportunity to expand knowledge of jazz styles and repertoire as well as refine reading skills and improve spontaneous interaction with other musicians. Placed through auditions held at the beginning of each semester.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1427 and EMUS 5427**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite EMUS 1427 or previous experience in large jazz ensembles.**EMUS 3437 (1) Jazz Combo**

Allows students the opportunity to perform in the principal format for jazz expression. The small group setting affords performers the opportunity to refine improvisation skills, improve spontaneous interaction with musicians and expand knowledge of jazz styles and repertoire. Placed through auditions held at the beginning of each semester.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1437 and EMUS 5437**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Recommended:** Prerequisite EMUS 1437 or previous performance experience in small jazz combos.**EMUS 3447 (1) Guitar Ensemble****Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3457 (1) Electronic Music Ensemble**

Explores performance, composition and the history of electronic music, including 20th century art music on through to electronic music in contemporary popular culture.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1457 and EMUS 5457**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.**EMUS 3467 (1) World Music Ensemble**

Study and performance of musics of diverse cultures in the United States, including Native American, Latin American, African American and Asian American, as well as music from the mother cultures of these groups.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1467 and EMUS 5467**Repeatable:** Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**EMUS 3477 (1) Chamber Choir**

Study and performance of various vocal styles, including madrigals and vocal jazz, investigation of the challenges of music making in a small group choral setting.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1477 and EMUS 5477**Repeatable:** Repeatable for up to 12.00 total credit hours.**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).**Grading Basis:** Letter Grade

EMUS 3507 (1) Chamber Music

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Music (MUSC) majors only.

EMUS 3517 (1) Campus Orchestra

Offers University string, wind and percussion performers not majoring in music an opportunity to play in a conducted orchestra. Rehearsals are one night per week and has limited performance demands. Auditions are not required for strings. Instruments are available if needed.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1517

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

EMUS 5217 (1) University Singers

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5227 (1) University Choir

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5297 (1) Wind Symphony

2.0 credit hours offered CE Aspen Music School only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5307 (1) Symphonic Band

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5327 (1) Symphony Orchestra

2.0 hours offered CE Aspen Music School only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5337 (1) Chamber Orchestra

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5357 (1) Harp Ensemble**EMUS 5367 (1) Early Music Ensembles**

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

EMUS 5377 (1) Chamber Music-Brass

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

EMUS 5387 (1) Chamber Music-Strings

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

EMUS 5407 (1) Chamber Music-Woodwinds

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

EMUS 5417 (1) Percussion Ensemble

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

EMUS 5427 (1) Jazz Ensemble

Students perform in a principal format for jazz expression. The large ensemble setting affords the opportunity to expand knowledge of jazz styles and repertoire as well as refine reading skills and improve spontaneous interaction with other musicians. Placed through auditions held at the beginning of each semester.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1427 and EMUS 3427

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EMUS 3427 or previous experience in large jazz ensembles.

EMUS 5437 (1) Jazz Combo

Allows students the opportunity to perform in the principal format for jazz expression. The small group setting affords performers the opportunity to refine improvisation skills, improve spontaneous interaction with musicians and expand knowledge of jazz styles and repertoire. Placed through auditions held at the beginning of each semester.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1437 and EMUS 3437

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EMUS 3437 or previous performance experience in small jazz combos.

EMUS 5447 (1) Guitar Ensemble

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

EMUS 5457 (1) Electronic Music Ensemble

Explores performance, composition and the history of electronic music, including 20th century art music on through to electronic music in contemporary popular culture.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1457 and EMUS 3457

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

EMUS 5467 (1) World Music Ensemble

Study and performance of musics of diverse cultures in the United States, including Native American, Latin American, African American and Asian American, as well as music from the mother cultures of these groups.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1467 and EMUS 3467

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

EMUS 5477 (1) Chamber Choir

Study and performance of various vocal styles, including madrigals and vocal jazz, investigation of the challenges of music making in a small group choral setting.

Equivalent - Duplicate Degree Credit Not Granted: EMUS 1477 and EMUS 3477

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

EMUS 5507 (1) Chamber Music

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Naval Science - ROTC (NAVR)

Courses

NAVR 1010 (2) Introduction to Naval Science

Introduction to the naval profession. Instruction emphasizes the mission, organization and warfare components of the Navy and Marine Corps.

Included is an overview of officer and enlisted ranks and rates, training, education, Naval customs and courtesies, military justice, leadership and nomenclature. Exposes the student to the professional competencies required to become a Naval/Marine Corps officer.

Additional Information: Departmental Category: Naval Science

NAVR 1840 (1-3) Independent Study

Additional Information: Departmental Category: Naval Science

NAVR 2020 (3) Seapower and Maritime Affairs

Surveys international maritime history and provides a review of American maritime history and policy. Examines American naval involvement in regional and global conflicts, evolution in technology and management, the role of the navies in foreign policy, and the influence of seapower on history.

Additional Information: Departmental Category: Naval Science

NAVR 3020 (3) Naval Operations and Seamanship

Examines the Inland and International Rules of the Nautical Road, including court interpretations, principles of relative motion and vector analysis with the maneuvering board, ship handling procedures, weather, communications, tactical operations, and maritime law.

Additional Information: Departmental Category: Naval Science

NAVR 3030 (3) Naval Engineering Systems

Studies in detail ship propulsion and related auxiliary systems. Emphasizes fossil fuel and nuclear steam and gas turbine systems. Stresses design constraints imposed by unique marine environment.

Additional Information: Departmental Category: Naval Science

NAVR 3040 (3) Weapons and Systems Analysis

Introduces theoretical concepts upon which modern naval weapons systems are designed and constructed. Specific areas of study include physics of underwater sound propagation, pulse radar theory, automatic tracking principles, and fundamentals of missile guidance.

Additional Information: Departmental Category: Naval Science

NAVR 3101 (3) Evolution of Warfare

Traces the development of warfare, focusing on the impact of military theorists and technical developments. Assists students to acquire a sense of strategy, develop an understanding of military alternatives, and see the impact of historical precedent on military actions.

Additional Information: Departmental Category: Naval Science

NAVR 3201 (3) Fundamentals of Maneuver Warfare

Prepares future military officers and other leaders for service by studying modern tactical principles, current military developments and other aspects of warfare and their interactions with and influences on maneuver warfare doctrine.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Naval Science

NAVR 4010 (3) Leadership and Management

Comprehensively studies organizational leadership. Emphasizes motivation, communication, empowerment, and needs of subordinates. Studies the role of professional and personal ethics in organizational leadership.

Additional Information: Departmental Category: Naval Science

NAVR 4020 (3) Leadership and Ethics

Studies the ethics and laws of armed conflict analyzing the leadership responsibilities of officers both in peace and in war. The curriculum focuses first on various moral, ethical and leadership philosophies followed by extensive use of case studies to reinforce the use of ethical decision-making tools. Defines the responsibilities of junior officers within the context of ethical leadership and decision making.

Additional Information: Departmental Category: Naval Science

NAVR 4030 (3) Navigation

Offers theory and practical application in the art of navigation: charts, publications, piloting, dead reckoning, navigation aids and instruments, time, electronic fixing, global positioning system, and voyage planning.

Additional Information: Departmental Category: Naval Science

NAVR 4101 (3) Amphibious Warfare

Surveys the development of amphibious doctrine. Emphasizes the evolution of amphibious warfare in the 20th century and beyond. Explores present-day potential and limitations on amphibious operations, including the rapid force deployment concept.

Additional Information: Departmental Category: Naval Science

Neuroscience (NRSC)

Courses

NRSC 2100 (4) Introduction to Neuroscience

Provides an introduction to fundamental concepts in neuroscience. The goal of this first course is to provide a strong foundation in neurobiology-cell biology, physiology of the neuronal membrane, interneuronal communication, neurotransmission, gross anatomy, and how the brain develops. Students will also learn principles of sensory systems functions. Recitation will reinforce lecture concepts through discussion of current research.

Requisites: Requires prerequisite courses of MCDB 1150 or EBIO 1210 (minimum grade C-).

NRSC 2101 (1-4) Topics in Neuroscience

Provides students with the opportunity to focus on a specific area of Neuroscience in depth. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

NRSC 2200 (2) Laboratory Techniques in Neuroscience

Introduces students to many basic and essential laboratory skills in neuroscience research. Students will learn experimental methods and perform experiments depicting principles in neurophysiology, neuroanatomy, neurochemistry, and the fundamentals of neuroimaging techniques.

Requisites: Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

NRSC 4011 (1-3) Senior Thesis

Critically reviews topics in neuroscience research, scholarly analysis of a major neuroscience issue, and/or empirical research project. See the neuroscience director for further information.

NRSC 4015 (3) Affective Neuroscience

Experiencing and learning from affect–emotional value–is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5015

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

NRSC 4032 (3) Neurobiology of Learning and Memory

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5032

Requisites: Requires a prerequisite course of PSYC 2012 or PSYC 4052 or NRSC 2100 or NRSC 4052 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Biological

NRSC 4052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5052 and PSYC 4052 and PSYC 5052

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following sequences EBIO 1210 and EBIO 1220 or CHEM 1113 and CHEM 1133 or PHYS 1010 and 1020 or PHYS 2010 and PHYS 2020 (all minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4062 (3) The Neurobiology of Stress

Provides an introduction to the concept of stress and the physiological systems involved. Factors modulating stress vulnerability versus resilience, and stress interactions with other systems with health relevance will be explored. Emphasis will be placed on current research on brain mechanisms. Formerly PSYC 4062.

Requisites: Requires prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

Recommended: Prerequisite a strong foundation and interest in biological psychology, neuroscience, and physiology.

Additional Information: Departmental Category: Biological

NRSC 4072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5072

Requisites: Requires a prerequisite course of PSYC 2012 or PSYC 4052 or NRSC 2100 or NRSC 4052 and one of the following sequences of courses: EBIO 1210 and 1220 or MCDB 1150 and 2150 or MCDB 1150 and EBIO 1220 or EBIO 1210 and MCDB 2150 (all minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4082 (3) Neural Circuits of Learning and Decision Making

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5082

Requisites: Requires prerequisite course of NRSC 2100 or NRSC 4052 (minimum grade C-).

Grading Basis: Letter Grade

NRSC 4092 (3) Behavioral Neuroendocrinology

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5092

Requisites: Requires a prerequisite course of NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

Additional Information: Departmental Category: Biological

NRSC 4132 (3) Neuropharmacology

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5132

Requisites: Requires a prerequisite course of NRSC 2100 (minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4155 (4) Cognitive Neuroscience/Neuropsychology

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4155

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following: PSYC 2111 or MATH 2510 or IPHY 2800 or EBIO 1010 or BCOR 1020 or ECON 3818 (all minimum grade C-).

NRSC 4542 (3) The Neurobiology of Mental Illness

Provides in depth study of what is known concerning the neurobiology of mental illnesses, with a focus on depression and anxiety. Consideration will be given to both animal models and human work, with neurochemical, circuitry level, and neuroinflammatory processes to be highlighted. There will be discussion of the intricacies of determining the effectiveness of pharmacological treatments, and what the implications of such treatments might be.

Requisites: Requires prerequisite courses of PSYC 2012 or NRSC 2100 and one of the following: PSYC 4052 or NRSC 4052 or NRSC 4132 or NRSC 4082 or NRSC 4092 or NRSC 4032 (all minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 4545 (3) Neurobiology of Addiction

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction.

Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5545

Requisites: Requires prerequisite courses of NRSC 4132 (minimum grade C-).

NRSC 4561 (2-3) Special Topics in Neuroscience

Presents and analyzes special interest topics from the broad and interdisciplinary field of neuroscience. The instructor determines the content of a particular section. Repeatable for up to 6.00 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of NRSC 2100 (minimum grade C-). Restricted to Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

NRSC 4841 (1-3) Independent Study in Neuroscience

Pass/Fail only.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Neuroscience (NRSC) majors only.

Grading Basis: Pass/Fail

NRSC 4911 (3) Teaching of Neuroscience

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 5911

NRSC 5015 (3) Affective Neuroscience

Experiencing and learning from affect-emotional value—is a fundamental part of the human experience. When people started thinking of brains as computers, research on emotion fell by the wayside. Recently however, this has changed, and there is an explosion of work on the brain mechanisms of affective value. Covers recent advances in understanding the emotional brain.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4015

Requisites: Restricted to graduate students only.

NRSC 5032 (3) Neurobiology of Learning and Memory

Provides a comprehensive treatment of how the brain acquires, stores, and retrieves memories. To do this we will consider (a) the methods used to address these issues, (b) what we know about how brain systems are organized to support memories of different types, and (c) the synaptic mechanisms that are involved.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4032

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4052 and PSYC 4052 and PSYC 5052

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5072 (3) Clinical Neuroscience: A Clinical and Pathological Perspective

Provides a review of the anatomy and physiology of the nervous system and then explores how alterations in these systems can result in neurologic or psychiatric disorders. Emphasizes pathological neuroanatomy, neurophysiology and neuropharmacology, which is essential for understanding problems related to health and disease.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4072

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5082 (3) Neural Circuits of Learning and Decision Making

Provides an in-depth survey of the neural mechanisms of learning, motivated behavior and decision making. Analysis will focus on the interaction of neural circuits underlying these processes with particular attention to the cellular, molecular and information-processing aspects of identified pathways and considered into the context learning-based and neuroeconomic models of choice.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4082

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

NRSC 5092 (4) Behavioral Neuroendocrinology

Provides an introduction to neuroendocrinology with a focus on the interaction between hormones and brain function. In addition to attending and meeting all the requirements for the lecture portion of the course, graduate students meet for an additional hour each week to discuss in depth behavioral neuroendocrinology relevant research articles.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4092

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5100 (2-5) Introduction to Neuroscience I

Provides an intensive introduction to the principles of neuroscience, initially covering the detailed neuroanatomy of human forebrain, hindbrain, and spinal cord. This is followed by neurophysiology with a concentration on the electrophysiology of neural systems. The basics of neuroanatomy and neurophysiology with a concentration on the electrophysiology are then applied to an examination of the structure and function of visual, auditory, and sensorimotor systems in animal and man.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Requisite, restricted to Interdepartmental Neuroscience Program or instructor consent required.

NRSC 5110 (3) Introduction to Neuroscience II

Provides an intensive interdisciplinary introduction to the principles of neuroscience. It is a sequel to NRSC 5100. Provides a detailed overview of neurochemistry, neurodevelopment, neuromotor control, neurogenetics, and cognitive neuroscience. Open to undergraduates with instructor permission.

Requisites: Requires a prerequisite course of NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

NRSC 5132 (3) Neuropharmacology

Study of drug action within the central nervous system. This course is designed to provide a fundamental understanding of the neurobiological and neurochemical mechanisms of drug action. Topics covered include the following: 1) principles of pharmacology; 2) brain neurotransmitter systems; 3) biochemical basis of psychiatric disorders and their pharmacological treatment.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4132

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

NRSC 5262 (3) Mammalian Neuroanatomy

Provides a detailed overview of peripheral and central nervous system connective neuroanatomy targeted at delineating functional sensory, motor and motivational systems and the control of behavior and cognition. Emphasizes histological, anatomical and functional techniques employed in investigations of the nervous system. Formerly PSYC 5262.

Requisites: Requires a prerequisite course of NRSC 2100 or NRSC 5100 or NRSC 4052 or PSYC 4052 (minimum grade C-).

Additional Information: Departmental Category: Biological

NRSC 5545 (3) Neurobiology of Addiction

Covers an intensive survey and synthesis of recent findings contributing to our understanding of the neurobiological basis of addiction. Analysis of both drug and behavioral addictions will be made at the molecular, cellular and neurocircuitry levels and synthesized into models utilizing common themes between various addictions and contributing pathologies.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4545

Requisites: Restricted to graduate students only.

NRSC 5911 (3) Teaching of Neuroscience

Offers a rich experience for students to develop and organize curriculum to complement the Neuroscience core courses. Offers a valuable teaching experience utilizing computational modeling to simulate experimental results. Any Neuroscience curriculum course, such as Intro to Neuroscience I or II, Neuropharmacology, Neurobiology of Learning and Memory or Behavioral Neuroscience may be appropriate with instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4911

Requisites: Restricted to graduate students only.

NRSC 6100 (2) Advances in Neuroscience Seminar

Designed for beginning graduate students interested in neuroscience. Students read, discuss, and evaluate the primary literature on a number of current topics in neuroscience as well as attend the seminar program in neuroscience.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

NRSC 6602 (1) Behavioral Neuroscience Professional Skills Development

Enrolled graduate students in the behavioral neuroscience program will be asked to prepare, present and receive feedback on scientific presentations of their own research or from review of a current research project.

Repeatable: Repeatable for up to 14.00 total credit hours.

Grading Basis: Letter Grade

NRSC 7102 (2-3) Topics in Neuroscience

Advanced seminar dealing with different specialized topics in neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7112 (3) Special Topics in Neuroscience I

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7122 (3) Special Topics in Neuroscience II

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7132 (3) Special Topics in Neuroscience III

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7142 (3) Special Topics in Neuroscience IV

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

NRSC 7152 (3) Special Topics in Neuroscience V

Advanced seminar dealing with several different specialized topics in Neuroscience.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of NRSC 5110 (minimum grade D-).

Norlin Scholars (NRLN)

Courses

NRLN 2000 (3) Constructions of Knowledge: Ways of Knowing in the Academy and Beyond

An interdisciplinary, cross-cultural exploration of different ways of knowing. Students gain an understanding of their own approaches to knowledge acquisition. Texts will come from various genres: poetry, prose, fiction, scholarly articles and film and performance. Explores cultural assumptions about knowledge and learning and look at how gender, race, class and other categories of cultural identity shape and interpret concepts of knowledge. Explores intellectual, emotional, spiritual and other types of knowledge. Department consent required.

Equivalent - Duplicate Degree Credit Not Granted: ARSC 2000

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

NRLN 3000 (1-3) Norlin Scholars Special Topics

Provides students a small, interdisciplinary seminar experience focusing on critical reading and writing, discussion, and experiential and practical learning. Students will apply their disciplinary knowledge and personal experiences to course content. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

NRLN 3500 (3) Constructions of Knowledge in the Fields

Required for Norlin Scholars, this is an upper division course exploring the relationship between the scholar and the chosen field. Investigates the concept of vocation and the epistemologies, pedagogies, rhetorics, technologies, ethics, cultures and prevailing narratives of students' major fields and career paths. A range of co-curricular activities augment the classroom learning. Department consent required.

Grading Basis: Letter Grade

Norwegian (NORW)

Courses

NORW 1010 (4) Beginning Norwegian 1

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Norwegian

NORW 1020 (4) Beginning Norwegian 2

Department enforced prerequisite: NORW 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Norwegian

NORW 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Norwegian

NORW 2110 (4) Second-Year Norwegian Reading and Conversation 1

Department enforced prerequisite: NORW 1020 (minimum grade C-). Fulfills the arts and sciences language requirement for the BA and BFA degrees.

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Norwegian

NORW 2120 (4) Second-Year Norwegian Reading and Conversation 2

Continuation of NORW 2110, with focus on Norwegian culture and society. Small group work and class discussions. Department enforced prerequisite: NORW 2110 (minimum grade C-).

Additional Information: Departmental Category: Norwegian

NORW 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Norwegian

Operations and Information Management (OPIM)

Courses

OPIM 6070 (3) Survey of Operations Research

Applications oriented survey of operations research topics including linear and integer programming, network analysis, dynamic programming, nonlinear programming, decision analysis, Markov chain and Markovian decision models, queuing theory and simulation.

OPIM 6080 (3) Operations Management

Covers demand forecasting, capacity management, scheduling, inventory planning and management, production planning and control, materials requirements planning, just-in-time production systems, product design and process selection, elements of statistical process control, service operations and quantitative techniques for operations decision making.

Equivalent - Duplicate Degree Credit Not Granted: EMEN 5500

OPIM 6820 (3) Special Topics in Systems

Offered irregularly to provide opportunity for investigation into new frontiers in systems.

Repeatable: Repeatable for up to 6.00 total credit hours.

OPIM 6900 (1-3) Independent Study

Requires prior consent of dean and instructor under whose direction study is taken. Intended only for exceptionally well-qualified business seniors who desire to study an advanced topic. Departmental form required.

OPIM 6930 (3) Assessing Sustainable Energy Technologies

Focuses on the commercialization prospects of emerging energy technologies, including solar, wind, biomass, oceanic, geothermal, hydropower, fuel cell (hydrogen), nuclear, and other more exotic energy sources. Investigates the technology feasibility, economic viability and progress of each technology, as well as its economic opportunities and challenges.

OPIM 6940 (1) Masters Candidate

Grading Basis: Letter Grade

OPIM 6950 (1-6) Master's Thesis

OPIM 7110 (3) Simulation Modeling and Analysis

Introduces the concepts of simulation modeling. Provides practical experience with real examples using popular commercial simulation packages such as Arena or Extend. Emphasizes discrete event simulation, but also covers topics in Monte Carlo simulation and system dynamics. Practical examples from operations management, manufacturing and services are used to give students an appreciation for the wide scope of application and the robust nature of simulation modeling in the context of decision making.

OPIM 7120 (3) Discrete Optimization

Covers the modeling and solution of discrete problems that arise in business and engineering. Classical techniques such as cutting planes and branch and bound are covered. Emphasizes the application of metaheuristic procedures, such as tabu search and evolutionary approaches, to the solution of practical combinatorial optimization problems.

OPIM 7330 (3) Advanced Operations Management Modeling

Covers concepts, models and solution techniques relevant to the management of the processes required to provide goods or services to consumers. Emphasizes supply chain systems topics such as production, inventory, distribution and scheduling. Management science and operations research methodology is also applied to problems such as facility capacity planning, facility design and location analysis.

OPIM 7400 (3) Stochastic Dynamic Programming with Applications

Covers the basic models and solution techniques for stochastic dynamic programs with finite or infinite number of stages. Application domains include, among other, revenue management and pricing, manufacturing, supply chains, service systems, and economics. Approximate solution techniques for problems involving large state/decision spaces and/or complex dynamics over time will also be discussed.

Requisites: Restricted to graduate students only.

Recommended: Requisite an introductory course in optimization and probability.

OPIM 7800 (3) Doctoral Proseminar in Systems

Provides systems doctoral students with an orientation to current research and the academic discipline in operations and information systems. Familiarizes students with key schools of thought in the field, provides background on reference disciplines, examines significant research streams and helps students begin developing their own area of interest.

OPIM 7805 (3) Foundations of Research in Information Systems

Examines foundations of information systems research, including classic readings in information systems and its reference disciplines, different research approaches, processes of research, and classic and contemporary readings in major topics in information systems.

Requisites: Restricted to graduate students only.

OPIM 7810 (3) Technical Topics in Information Systems Research

Examines in depth a selection of topics in technical areas of information systems. Includes theoretical perspectives for technical topics, critical perspectives on past and current research, appropriate methods for examining technical topics, and development of students' ability to identify and develop research topics in technical areas.

Requisites: Restricted to graduate students only.

OPIM 7815 (3) Behavioral Topics in Information Systems Research

Covers both basic and advanced topics. Develops skill in designing, evaluating, and understanding both quantitative and qualitative research methods. Includes the development of research proposals, making and justifying methodological choices, writing research reports, and understanding how to publish in information systems.

Requisites: Restricted to graduate students only.

OPIM 7820 (3) Advanced Research in Information Systems

Examines advanced topics in information systems research, focusing on the electronic era and ebusiness. Examines foundations of ebusiness, including basic technical, organizational, and behavioral foundations. Covers leading edge research from both topical and methodological perspectives. Focuses on methods appropriate for studying ebusiness and examines future research directions.

Requisites: Restricted to graduate students only.

OPIM 8820 (3) Large-Scale Optimization

Covers computational techniques for solving optimization problems with a large number of variables and/or constraints. The techniques will have many business and engineering applications. With the emphasis on integer programming, we will study Branch-and-Cut, Lagrangian relaxation, column generation and Bender's decomposition, from both a theoretical and practical perspective. Students will learn to formulate and solve large-scale problems and learn how to apply these techniques for their research.

OPIM 8900 (1-3) Independent Study**OPIM 8990 (1-10) Doctoral Thesis**

Operations Management (OPMG)

Courses

OPMG 6900 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: MBA: Operations and Production Management

OPMG 6940 (1) Master's Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: MBA: Operations and Production Management

OPMG 6950 (1-6) Master's Thesis

Additional Information: Departmental Category: MBA: Operations and Production Management

OPMG 8990 (1-10) Doctoral Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Additional Information: Departmental Category: MBA: Operations and Production Management

Organization Management (ORMG)

Courses

ORMG 7310 (3) Seminar on Organizational Behavior

Doctoral level seminar covering such issues as leadership, job attitudes, motivation, absenteeism, turnover, goal setting, and group dynamics. Instructor consent required.

Requisites: Restricted to graduate students only.

ORMG 7320 (3) Doctoral Seminar: Macro Aspects of Entrepreneurship

Critically investigates major issues in organization theory and provides students with experience in comprehensively surveying literature in subject areas such as organization design, power, culture, innovation, technology, environment, size, and strategy. Instructor consent required.

Requisites: Restricted to Business Administration (BUAD) graduate students only.

ORMG 7330 (3) Seminar and Practicum in Organization Development

Provides a doctoral level seminar emphasizing intervention theory and method in effectuating organizational change in a client system. Deals with group development, educational processes, conflict resolution, organizational interventions, change strategies, and ethical and skill requirements of the consultative role.

ORMG 7800 (3) Doctoral Proseminar: Management

Provides an orientation to doctoral level study for all students in management. Through critical analysis of articles and student and faculty presentations, students learn about reading and writing research articles and gain an overview of the management discipline.

Requisites: Restricted to graduate students only.

ORMG 7830 (3) Research Design and Methods in Management

Introduction to research design and commonly used methods in management and organizational research. Covers the fundamental building blocks of research, provides the basics of a number of analytical techniques, and presents considerations important in analyzing multivariate data in organizational research.

Requisites: Restricted to Business (BUSN) graduate students only.

ORMG 8820 (1-4) Graduate Seminar

Provides opportunity for investigating new frontiers in organization management through an experimental seminar (offered irregularly).

ORMG 8900 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

ORMG 8990 (1-10) Doctoral Thesis

Peace & Conflict Studies (PACS)

Courses

PACS 2500 (3) Introduction to Peace, Conflict and Security Studies

Introduces the related fields of peace, conflict and security studies. Examines causes and dynamics of conflict and violence (interpersonal to global). Examines theory and research concerning peace movements, conflict resolution and security institutions. Explores career options in related fields.

Grading Basis: Letter Grade

PACS 3700 (3) Communication and Conflict Management

Examines interdisciplinary concepts and theories enabling students to better understand different types of conflict, sources of conflict, and communication patterns that serve to create, maintain and transform conflict. Teaches practical skills in conflict management areas such as bargaining, facilitation, mediation and negotiation.

Equivalent - Duplicate Degree Credit Not Granted: COMM 3700

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

PACS 3800 (3) Security Studies

Provides an introduction to the academic field of "Security Studies". Focuses on motives, institutions and processes associated with societal defense against threats posed to cherished possessions and the pursuit of stable, autonomous and prosperous existence. Reviews related theoretical traditions associated with militarism, war and conflict. Covers key concerns of (in-)security in post 9/11 global society, including surveillance, terrorism, genocide and insurgency.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3123

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Grading Basis: Letter Grade

PACS 4500 (3) Senior Seminar in Peace, Conflict and Security Studies

Uses theoretical perspectives in peace, conflict and security studies to conduct in-depth research projects, using a case-study approach. Emphasizes use the critical thinking skills in writing, presentations and class discussion. Case study examples include: U.S. militarism, humanitarian intervention in genocide and environmental conflict resolution.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of PACS 2500 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior).

Grading Basis: Letter Grade

Performance Music (PMUS)

Courses

PMUS 1105 (1) Keyboard Musicianship 1

Introduces the keyboard, music reading in the treble and bass clefs, basic theory and keyboard harmony, technical patterns, and improvisation. Studies easy classical and pop repertoire.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Keyboard Musicianship

PMUS 1184 (1) Voice Class

Involves basic vocal technique and easy solo repertoire taught through a group medium, for beginner and intermediate level students.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

PMUS 1205 (1) Keyboard-Musicianship 2

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard Musicianship

PMUS 1515 (2) Jazz Piano Class

Offers small group instruction in the concepts and skills required to learn jazz piano. Students not only learn basic techniques required to play jazz but also become familiar with the theory, grammar, and lexicon of the jazz language. Offered spring only.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of PMUS 1205 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard Musicianship

PMUS 1726 (2-4) Voice

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

PMUS 2105 (1) Keyboard-Musicianship 3

Continuation of PMUS 1205.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of PMUS 1205 (minimum grade D-). Restricted to College of Music (MUSCU) majors or graduate students only.

Additional Information: Departmental Category: Keyboard Musicianship

PMUS 2184 (1) Voice Class

Continuation of PMUS 1184, with more advanced repertoire and vocal techniques.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of PMUS 1184 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

PMUS 2205 (1) Keyboard-Musicianship 4

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Keyboard Musicianship

PMUS 2726 (2-4) Voice

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

PMUS 3167 (3) Opera Theatre Stagecraft

Introduction to the processes, materials, and equipment used in theatrical production. Lecture and lab requirements. Lab experiences include introductory work in the opera scenery, property, costume, and electrical shops.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Voice

PMUS 3271 (2) Basic Improvisation

Explores basic tonal music improvisation and performance styles that include Bach Solo Suites, Classical concerto cadenzas and music of India. Offered spring of even-numbered years.

Requisites: Requires prerequisite course of MUSC 2111 (minimum grade D-). Restricted to College of Music (MUSC) undergraduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

PMUS 4105 (1) Supervised Accompanying

Assigned projects, both vocal and instrumental, are coached by collaborative piano faculty and others. May involve recital, jury, or master class performances.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of MUSC 1325 and MUSC 2365 (all minimum grade D-). Restricted to College of Music students only.

Additional Information: Departmental Category: Keyboard Musicianship

PMUS 4137 (1) Opera Theatre 1

Addresses issues related to young artist development. Areas of concentration include (but are not limited to) acting technique, resume preparation, audition technique, scene analysis, and role preparation. The acting technique is addressed in this course through textbook reading and exercise.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Voice

PMUS 4147 (1) Opera Theatre 2

Continuation of PMUS 4137. Further scene analysis and movement exercises are addressed in this class.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of PMUS 4137 (minimum grade D-). Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

PMUS 4157 (1-3) Opera Practicum

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Voice

PMUS 4167 (1-3) Opera Theatre Lab

Advanced work in the scenery, property, costume, and electrical shops in opera performance. Additional experiences may include positions with opera run crews, the box office, or other supporting areas.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

Additional Information: Departmental Category: Voice

PMUS 4497 (1-2) Vocal Repertoire Coaching

Group coaching class to prepare for voice recitals as well as to learn vocal repertoire including historical background, composers, styles, and poetic interpretation.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Voice

PMUS 4517 (2) Orchestral Repertoire

Trains practice techniques for string players to master orchestral excerpts needed for all orchestra and festival auditions. Through careful listening students learn the four basic elements of orchestral excerpt preparation: rhythm, intonation, tone quality, interpretation.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSC) majors or graduate students only.

Additional Information: Departmental Category: Choral and Instrumental Music

PMUS 5137 (2) Opera Theatre 1

Addresses issues related to young artist development at the graduate level. Areas of concentration will include (but are not limited to) acting technique for singers, resume preparation and scene and character analysis. Students will participate in acting and improvisation exercises. Substantial classical voice study is required.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Recommended: Prerequisite Voice Majors only.

Additional Information: Departmental Category: Voice

PMUS 5147 (2) Opera Theatre 2

Continuation of PMUS 5137.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Requires prerequisite course of PMUS 5137 (minimum grade D-). Restricted to College of Music (MUSC) graduate students only.

Additional Information: Departmental Category: Voice

PMUS 5184 (1) Graduate Voice Class

Teaches solo and choral singing and vocal modeling. Designed for choral and music education graduate students. Instructor consent required.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

PMUS 5497 (1-2) Vocal Repertoire Coaching

Group coaching class to prepare for voice recitals as well as to learn vocal repertoire including historical background, composers, styles, and poetic interpretation. Class may fulfill voice literature requirements when appropriate classes are not offered. Also available: weekly individual coaching to prepare for voice recitals and other projects. Diction, musical styles, and interpretation (music and text) are the main focus of this course. For graduate voice students and collaborative pianists.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

Additional Information: Departmental Category: Voice

PMUS 6506 (2-3) Bassoon

Repeatable: Repeatable for up to 12.00 total credit hours.

PMUS 6516 (2-3) Clarinet

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6556 (2-3) Flute

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6596 (2-3) Horn

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6606 (2-3) Oboe

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6696 (2-3) Viola

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6706 (2-3) Violin

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6716 (2-3) Violoncello

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

PMUS 6726 (2-3) Voice

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Philosophy (PHIL)

Courses

PHIL 1000 (3) Introduction to Philosophy

Introduces students to the most fundamental questions of human existence, either typically or through various major figures in philosophy. Topics many include free will, the mind-body problem, the nature of the self, the existence of God, knowledge of the external world, the nature of morality, the meaning of life.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

PHIL 1010 (3) Introduction to Western Philosophy: Ancient

Develops three related themes: the emergence in antiquity of a peculiarly scientific mode of thinking; the place of religious belief within this developing scientific world view; and the force of ethical speculation within the culture and political climates of ancient Greece and Rome. PHIL 1010 and PHIL 1020 may be taken in either order.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 1030

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Historical Context

PHIL 1020 (3) Introduction to Western Philosophy: Modern

Introduces several philosophical texts and doctrines of 17th and 18th century Europe. Gives special attention to the connection between philosophical ideas and the wider historical milieu: social, political and literary. PHIL 1010 and PHIL 1020 may be taken in either order.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Historical Context

PHIL 1100 (3) Ethics

Introductory study of major philosophies on the nature of the good for humanity, principles of evaluation, and moral choice as they apply to contemporary moral problems.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

PHIL 1160 (3) Introduction to Bioethics

Introduce students to topics in contemporary bioethics. No previous knowledge of science, philosophy, or bioethics will be presupposed. A primary goal will be to teach students how to think critically and write persuasively.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 1200 (3) Contemporary Social Problems

Examines competing positions in debates over a wide variety of controversial moral, social and political issues. Topics may include: abortion, world poverty, animal rights, immigration, physician-assisted suicide, freedom of religion, hate speech, cloning, income inequality, pornography, gun rights, racial profiling, capital punishment, overpopulation, prostitution, drug legalization, torture.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

MAPS Course: Social Science

PHIL 1400 (3) Philosophy and the Sciences

Considers philosophical topics and concepts related to the natural sciences, such as the following: science and pseudo-science; scientific method; the nature of explanation, theory, confirmation, and falsification; the effect of science on basic concepts like mind, freedom, time, and causality; ethics of experimentation; and the relation of science to society.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Natural Science Non-Sequence

PHIL 1440 (3) Critical Thinking

Introductory study of definition, informal fallacies and the principles and standards of correct reasoning. Provides practice in analyzing, evaluating and constructing frequently encountered types of arguments. Does not fulfill major requirement in logic.

PHIL 1500 (3) Reading, Writing and Reasoning

Teaches students how to write argumentative papers. Each seminar will focus narrowly on some controversial topic. For example, one seminar might focus on the existence of God, whereas another might question whether we have free will. In all cases, a significant portion of the course will be devoted to learning how to write cogent argumentative papers about controversial topics.

Additional Information: Arts Sci Core Curr: Written Communication

PHIL 1600 (3) Philosophy and Religion

Philosophical introduction to some of the central concepts and beliefs of religious traditions, focusing particularly on the question of the existence of God and on the relation between religious beliefs and moral beliefs.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

PHIL 1700 (3) Philosophy and the Arts

Considers philosophic questions involved in the analysis and assessment of artistic experiences and of the objects with which the arts, including the literary arts, are concerned.

PHIL 1750 (3) Philosophy through Literature

Introduces philosophy through literature. Selected novels, plays, and short stories that exemplify traditional problems in philosophy are read and discussed.

PHIL 1800 (3) Open Topics/Philosophy

Repeatable: Repeatable for up to 6.00 total credit hours.

PHIL 2140 (3) Environmental Justice

Traditional and contemporary theories of justice are employed in order to critically analyze social and political issues that have important environmental dimensions. Assesses the relationship of justice and equity to the presuppositions of national and global environmental issues and policies.

PHIL 2150 (3) Ethics and Sex

Explores a variety of moral questions relating to sex and procreation. Topics may include arguments for and against the wrongness of masturbation, homosexuality, transgenderism, incest, pedophilia, bestiality, necrophilia, voyeurism, pornography, sadomasochism, prostitution, abortion, commercial surrogacy and cloning, as well as arguments addressing such additional subjects as what constitutes rape and whether procreation is morally obligatory, optional, or forbidden.

PHIL 2200 (3) Major Social Theories

Introductory study of major philosophies of the past in relation to political, economic, and social issues.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 2220 (3) Philosophy and Law

Considers philosophical issues related to law in general and the U.S. system in particular. Topics to be covered may address such questions as the following: What is the nature of law? What kinds of acts should the law prohibit (e.g., abortion, drug use, pornography, cloning)? Is there a moral obligation to obey the law? Can civil disobedience be justified? Is there a justification for punishing people for breaking the law? Is capital punishment, in particular, morally justified?

Additional Information: Arts Sci Core Curr: United States Context

PHIL 2260 (3) Philosophy and Food

Introduces students to topics and issues connected to the nature of food. Helps students investigate questions about our food choices, production and distribution, as well as connection food bears to culture and identity. No previous experience in philosophy required or presupposed.

PHIL 2270 (3) Philosophy and Race

Explores the historical relationship between western philosophy and race and investigates the ways in which philosophy can be used to address contemporary racial issues.

Additional Information: Arts Sci Core Curr: Human Diversity

PHIL 2290 (3) Philosophy and Women

Explores different approaches to the study of women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2290

Additional Information: Arts Sci Core Curr: Human Diversity

PHIL 2390 (3) Philosophy and Psychology

Interdisciplinary course on issues where philosophy and psychology meet. For example, topics such as selfhood, motivation, psychotherapy, freedom, and human behavior are examined. Selected readings in philosophy and psychology are required.

PHIL 2440 (3) Symbolic Logic

Introduces students to sentential logic, the logic of quantification and some of the basic concepts and results of metalogic (interpretations, validity and soundness).

PHIL 2750 (3) Philosophy and Science Fiction

Explores philosophical issues in science fiction literature and film. Topics may include time travel, artificial intelligence, free will, personal identity, and how scientific advances will change human life and society. Students may read science fiction stories and philosophical articles, and watch several movies.

PHIL 2800 (3) Open Topics/Philosophy

Repeatable: Repeatable for up to 6.00 total credit hours.

PHIL 2840 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3000 (3) History of Ancient Philosophy

Survey of selected figures in ancient Greek and Roman philosophy and in medieval philosophy. Philosophers studied may include the pre-Socratics, Plato, Aristotle, the Hellenistic philosophers and such figures as Aquinas and Occam. Explores the larger cultural context that influenced these philosophers and were, in turn, influenced by them. Department enforced prerequisite: 6 hours of philosophy coursework.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context

PHIL 3010 (3) History of Modern Philosophy

Introduces modern philosophy, focusing on the period from Descartes through Kant. In addition to careful analysis of philosophical arguments, attention is paid to the ways in which philosophers responded to and participated in major developments in the 17th and 18th century, such as the scientific revolution. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context

PHIL 3100 (3) Ethical Theory

Examines important doctrines and arguments in various areas of theoretical ethics, such as the normative ethics of behavior, axiology, virtue theory and metaethics.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 6 hours of philosophy course work.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3110 (3) Feminist Practical Ethics

Explores a variety of personal and public policy issues in the light of the basic feminist commitment to opposing women's subordination. Provides a sense of how a principled commitment to feminism may influence or be influenced by prevailing interpretation of contemporary ideals and values, and gives an opportunity for developing skills of critical analysis.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PHIL 2290 or WGST 2000 or WGST 2290.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3140 (3) Environmental Ethics

Examines major traditions in moral philosophy to see what light they shed on value issues in environmental policy and the value presuppositions of the economic, ecological, and juridical approaches to the environment.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3140

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PHIL 1100 or PHIL 1200 or PHIL 2200 or PHIL 3100 or PHIL 3200.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3160 (3) Bioethics

Analysis of ethical problems involved in such issues as abortion, euthanasia, organ transplants, eugenics, treatment of the patient as a person and the institutional nature of the health care delivery system. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3180 (3) Critical Thinking: Contemporary Topics

Looks at a selected topic such as nuclear disarmament, racial and sexual discrimination, animal rights, or abortion and euthanasia by examining issues through the lens of critical philosophical analysis. Reviews the reasoning behind espoused positions and the logical connections and argument forms they contain. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3190 (3-4) War and Morality

Focuses on moral issues raised by war as a human institution. What are the justifications, limits and alternatives? Does the advent of nuclear weapons change the nature of war? Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3200 (3) Social and Political Philosophy

Systematic discussion and analysis of such philosophic ideas as community, freedom, political power, and violence.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite 6 hours of philosophy course work.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3260 (3) Philosophy and the International Order

Considers philosophical topics concerning the international economic, political and legal systems. Topics that may be considered include the nature of international law, war and peace, humanitarian intervention, international justice, world hunger and human rights. Department enforced prerequisite: 6 hours philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Ideals and Values

PHIL 3310 (3) Cognitive Science

An interdisciplinary introduction to cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and LING 3005 and PSYC 3005 and SLHS 3003

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2440 or PSYC 2145.

PHIL 3410 (3) History of Science: Ancients to Newton

Surveys the history of science up to Newton, including the emergence of scientific modes of thinking from religious and philosophical roots in the Near East and Greece to the development of these modes in the Middle Ages and Renaissance. Culminates with Isaac Newton and the 17th century scientific revolution. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Natural Science Non-Sequence

PHIL 3430 (3) History of Science: Newton to Einstein

History of physical and biological science, from the epoch-making achievements of Charles Darwin in biology to the dawn of the 20th century revolutions in physics, chemistry and genetics. Deals with the success of the mechanical philosophy of nature and its problems. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: Natural Science Non-Sequence

PHIL 3480 (3) Critical Thinking/Writing in Philosophy

Focuses upon the fundamental skills, methods, concepts and distinctions that are essential for the study of philosophy. Basic skills covered include the writing of philosophy papers, the reading of articles and the extraction and evaluation of arguments.

Requisites: Requires a prerequisite or corequisite course of PHIL 1440 or PHIL 2440 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Philosophy (PHIL) majors only (excluding minors).

Recommended: Prerequisites 6 hours of philosophy course work.

Additional Information: Arts Sci Core Curr: Written Communication

PHIL 3600 (3) Philosophy of Religion

Philosophical discussion of fundamental issues in religion, such as existence of God, religious experience, faith and reason, evil, immortality and religious language. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr. Ideals and Values

PHIL 3700 (3) Aesthetic Theory

Introduces major theories of aesthetics and contemporary discussions of problems, such as the nature of art and the problem of evaluations in art. Department enforced prerequisite: 6 hours of philosophy course work.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3800 (3) Open Topics in Philosophy

See current departmental announcements for specific content. Department enforced prerequisite: 6 hours of philosophy course work.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

PHIL 3840 (1-3) Independent Study

Department enforced prerequisite: 6 hours of philosophy course work.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 3930 (1-6) Internship in Social Policy

Under the guidance of an official in a governmental or non-governmental organization, students are assigned to projects selected for their academic suitability as well as for value to the sponsoring organization. Prior approval of department required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisites PHIL 1200 and PHIL 2200 and PHIL 3200 and 9 hours in moral or political philosophy course work.

PHIL 4010 (3) Single Philosopher

Intensively studies the work of one historical figure in philosophy, with the aim of reaching a broad understanding of the philosopher's whole body of thought. Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5010

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4020 (3) Topics in the History of Philosophy

Examines a specific philosophical problem over an extended historical period.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites 12 hours of philosophy course work including PHIL 3000 and PHIL 3010.

PHIL 4030 (3) Medieval Philosophy

Introduces philosophy from the late Roman era to the 14th century. Philosophers studied may include Augustine, Boethius, Aquinas, and Ockham. Topics range over religion, ethics, mind, and metaphysics.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4040 (3) Studies in 20th Century Philosophy

Studies two or three major philosophies prominent during the last century.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4070 (3) Existentialist Philosophy

Examines central figures and texts in the existential tradition, from Kierkegaard and Nietzsche to Heidegger and Sartre.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4110 (3) Contemporary Moral Theory

Provides an in-depth look at some recent work in moral theory. Topics covered, varying from year to year, include: consequentialism and its critics; virtue theory; moral psychology; impartiality and the personal point of view.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites PHIL 3100 and 12 hours philosophy course work.

PHIL 4120 (3) Philosophy and Animals

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5120

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PHIL 3100 and 12 hours philosophy course work.

PHIL 4200 (3) Contemporary Political Philosophy

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of PHIL 2200 and PHIL 3200 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours of philosophy course work.

PHIL 4210 (3) Classical Greek Political Thought

Studies main representatives of political philosophy in antiquity (Plato, Aristotle, Cicero) and of the most important concepts and values of ancient political thought. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 4041 and CLAS 5041 and HIST 4041

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite CLAS 1051 or CLAS 1061 or HIST 1011 or HIST 1051 or HIST 1061 or PSCI 2004 or PHIL 3000.

PHIL 4250 (3) Marxism

Historical and systematic study of principal themes of Marxist thought, from its Hegelian origins to its contemporary varieties, emphasizing the works of Marx and Engels.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4251

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours of GRMN or PHIL course work or instructor consent.

PHIL 4260 (3) Philosophy of Law

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5260

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4300 (3) Philosophy of Mind

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5300

Requisites: Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 and PHIL 4340 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 4340 (3) Epistemology

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

Equivalent - Duplicate Degree Credit Not Granted: 5340

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

Recommended: Prerequisites PHIL 3480 and 12 credit hours of philosophy including PHIL 2440 and PHIL 3010.

PHIL 4360 (3) Metaphysics

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5360

Requisites: Requires prerequisite courses PHIL 2440 and PHIL 3010 and PHIL 3480 and PHIL 4340 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 4370 (3) Free Will and Determinism

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5370

PHIL 4400 (3) Philosophy of Science

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5400

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites 12 hours philosophy course work including PHIL 2440.

PHIL 4440 (3) Topics in Logic

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic. Department enforced prerequisite: 12 hours PHIL course work, including PHIL 2440.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

PHIL 4450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics. Uses case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5450 and PHYS 4450 and PHYS 5450

Requisites: Requires prerequisite course PHYS 1020 or PHYS 1120 or PHYS 2020 (all minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4460 (3) Modal Logic

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5460

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PHIL 2440.

PHIL 4470 (3) Probability and Rational Choice

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox, and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle, and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons, and Schelling points), and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5470

Recommended: Prerequisite PHIL 2440 and 12 hours philosophy course work.

PHIL 4490 (3) Philosophy of Language

Examines theories and problems regarding the nature of language and its relation to reality. Concepts discussed include sense, reference, conventions, intentions and their relation to science and social life. Relevant literature includes readings in Frege, Russell, Quine, Putnam, Kripke and Chomsky.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5490

Requisites: Requires prerequisite course PHIL 2440 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4600 (1) Theology Forum Seminar

Discusses a variety of theological and philosophical topics. Some reading, much discussion, occasional guest speakers.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4800 (3) Open Topics in Philosophy

See current departmental announcements for specific content.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4830 (3) Senior Seminar in Philosophy

Critical in-depth examination of a selected philosophical topic.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Philosophy (PHIL) majors only.

Recommended: Prerequisite 15 hours philosophy course work.

PHIL 4840 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

Recommended: Prerequisite 12 hours philosophy course work.

PHIL 4950 (3) Honors Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 12 hours philosophy course work.

Additional Information: Arts Sciences Honors Course

PHIL 5010 (3) Single Philosopher

Philosophers covered include, from year to year, Plato, Aristotle, Augustine, Aquinas, Descartes, Spinoza, Locke, Leibniz, Hume, and Kant. Includes at least one course per year on an ancient author and one course per year on a modern author.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4010

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5020 (3) Topics in the History of Philosophy

Examines a specific philosophical problem over an extended historical period.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4020

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5030 (1) Greek Philosophical Texts

Selected readings in classical philosophy, with a focus on achieving fluency in reading philosophical Greek. May enroll in multiple sections in the same term.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

PHIL 5040 (1) Latin Philosophical Texts

Selected readings in classical and medieval authors, in the original language. The focus is on achieving fluency in reading philosophical Latin.

Repeatable: Repeatable for up to 7.00 total credit hours.

PHIL 5100 (3) Ethics

Presents representative positions in normative ethics and metaethics.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5110 (3) Contemporary Moral Theory

Provides an in-depth look at some recent work in moral theory. Topics covered, varying from year to year, include: consequentialism and its critics; virtue theory; moral psychology; impartiality and the personal point of view.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4110

Requisites: Restricted to graduate students only.

PHIL 5120 (3) Philosophy and Animals

Examines the moral status of nonhuman animals, and its implications for the common use of animals as food and experimental subjects for humans.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 5120

Requisites: Restricted to graduate students only.

PHIL 5200 (3) Contemporary Political Philosophy

Provides a survey of recent approaches to political philosophy: liberalism (Rawls, Dworkin); libertarianism (Nozick); communitarianism (Sandel, Macintyre); feminism (Jaggar). Topics and readings vary with the instructor.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5210 (3) Philosophy and Social Policy

Studies philosophical approaches to social and political issues such as abortion, bioethics, environmental preservation, human rights, and reverse discrimination. Gives attention to strengths and weaknesses of philosophical treatments of these issues.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5230 (3) Bioethics and Public Policy

Examines public policy implications of contemporary biological, genetic, biomedical, and behavioral science in light of ethics and human values. Considers theoretical and practical grounds for moral assessment of scientific research and possible applications of technology.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5240 (3) Seminar in Environmental Philosophy

Philosophical examination of several different approaches to environmental problems: economic, juridical, political and ecological. Discusses specific environmental problems, focusing on their moral dimensions, e.g., wilderness preservation, animal rights and land use and urban planning.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5240

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5260 (3) Philosophy of Law

Considers philosophical topics concerning law and the U.S. legal system. Topics that may be considered include the nature of law, relations between law and morality, justifications of punishment, the moral duty to obey the law, and law and liberty.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4260

Requisites: Restricted to graduate students only.

PHIL 5290 (1-3) Topics in Values and Social Policy

Deals with topics in the area of philosophy and public policy and is often interdisciplinary in focus. Topics vary from one semester to another.

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5300 (3) Philosophy of Mind

Discusses topics in the philosophy of mind, including the mind-body problem, consciousness, intentionality, rationality, mental causation and the nature of mental states.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4300

Requisites: Restricted to graduate students only.

PHIL 5340 (3) Epistemology

Studies some of the main topics of theory of knowledge, such as evidence, justification, prediction, explanation, skepticism, and concept acquisition.

Equivalent - Duplicate Degree Credit Not Granted: 4340

PHIL 5360 (3) Metaphysics

Traditional and contemporary theories of the basic categories of reality and the human relationship to it, including universals, substance, identity, change, mind and body, free will and modality.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4360

Requisites: Restricted to graduate students only.

PHIL 5370 (3) Free Will and Determinism

Explores the full range of questions relating to the problem of free will and determinism. Topics may include; the scientific evidence for determinism, hard versus soft determinism, arguments for and against the compatibility of free will and determinism, moral responsibility and the principle of alternate possibilities, hierarchical motivation, the deep self, reactive attitudes, the intelligibility question for libertarianism, divine foreknowledge.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4370

PHIL 5400 (3) Philosophy of Science

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4400

Requisites: Restricted to graduate students only.

PHIL 5440 (3) Topics in Logic

Provides for offering courses in a variety of topics in logic, including, but not limited to, mathematical logic, philosophical issues in logic, probability theory, decision theory, and inductive logic.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4450 and PHYS 5450 and PHYS 5450

Requisites: Restricted to graduate students only.

PHIL 5460 (3) Modal Logic

Introduces the most philosophically relevant kind of logic that builds on PHIL 2440. Modal logic is the logic of the concepts of necessity, possibility and contingency. A variety of systems of sentential modal logic will be covered, along with the standard system of first-order modal logic.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4460

Requisites: Restricted to graduate students only.

PHIL 5470 (3) Probability and Rational Choice

Examines issues in four related areas: probability theory (e.g. the interpretation of probability, the raven paradox and the principle of indifference), decision theory (e.g., the Newcomb problem, the toxin puzzle and Pascal's wager), game theory (e.g., Prisoner's dilemma, tragedy of the commons and Schelling points) and social choice theory (e.g., Arrow's theorem). Familiarity with symbolic logic is strongly recommended.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4470

Requisites: Restricted to graduate students only.

PHIL 5490 (3) Philosophy of Language

Examines theories and problems regarding the nature of language and its relation to reality. Concepts discussed include sense, reference, conventions, intentions and their relation to science and social life. Relevant literature includes readings in Frege, Russell, Quine, Putnam, Kripke and Chomsky.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 4490

Requisites: Restricted to graduate students only.

PHIL 5500 (3) Advanced Formal Semantics

Considers topics in the semantics of natural language not normally covered in first courses in philosophy of language. These include: natural deduction and sequent calculi for conditional logic; interpretation as logical inference; Lambek calculus and applicative categorial grammar; applications such as generalized coordination, plurals, higher-order intensional logic, generics, focus, and event-based semantics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHIL 5490.

PHIL 5550 (3) Metaphysics and Epistemology Proseminar

Covers seminal classic texts and/or fundamental topics in analytic metaphysics and epistemology.

Requisites: Restricted to Philosophy graduate students only.

PHIL 5600 (3) Philosophy of Religion

Studies topics falling under philosophy of religion, such as proofs for God's existence, religious language, mysticism, psychology of religion, modern theological movements, miracles, and study of individual theologians.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5700 (3) Aesthetics

Analyzes the principal topics of aesthetics, including such issues as formal structure of aesthetics, the nature of critical judgments, and the status of the work of art.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5800 (3) Open Topics in Philosophy

Variety of new courses at the 5000 level. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 5810 (1-3) Special Topics in Philosophy

Instructor meets regularly with three or more students to discuss special topics in philosophy.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 5840 (1-3) Graduate Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 6000 (3-4) Seminar in the History of Philosophy

Studies advanced topics in the history of philosophy. Content varies by semester, but may extend to any period in the history of philosophy, from the Presocratics into the modern era.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHIL 6100 (3) Seminar in Ethics

Intensive study of selected topics in ethical theory.

Requisites: Restricted to graduate students only.

PHIL 6200 (3) Seminar in Social and Political Philosophy

Provides an in-depth look at some particular topic in social and political philosophy, such as rights, political freedom, political obligation, or democracy.

Requisites: Restricted to graduate students only.

PHIL 6300 (3) Seminar in Philosophy of Mind

Studies selected topics in philosophy of mind.

Requisites: Restricted to graduate students only.

PHIL 6310 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and LING 6200 and PSYC 6200 and SLHS 6402

Requisites: Restricted to graduate students only.

Recommended: Prerequisite at least one course at the 3000 level or higher in computer science, linguistics, philosophy, or psychology.

PHIL 6340 (3) Seminar in Epistemology

Studies some of the main topics of epistemology, such as skepticism, foundations of knowledge, perception, introspection, belief, certainty, and analytic-synthetic distinctions.

Requisites: Restricted to graduate students only.

PHIL 6380 (3) Seminar in Metaphysics

Traditional and contemporary theories of the basic categories used to describe nature and the human relationship to it, including such concepts as substance, identity, space and time, causality, determination, and systematic ontology.

Requisites: Restricted to graduate students only.

PHIL 6400 (3) Seminar in Philosophy of Science

Topics connected with development of nature of science: the structure of scientific theories, the testing of hypotheses, the theory of decisions in science and the basic conceptions and models of abstraction in the history of science.

Requisites: Restricted to graduate students only.

PHIL 6490 (3) Seminar in Philosophy of Language

Studies some of the main topics in the philosophy of language, such as meaning and theories of meaning, translation, speech acts, rules of language, reference, relevance of psycholinguistics, language and thought, and language and ontology.

Requisites: Restricted to graduate students only.

PHIL 6940 (1) Master's Candidate for Degree

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Philosophy graduate students only.

Grading Basis: Pass/Fail

PHIL 6950 (1-6) Master's Thesis

Repeatable: Repeatable for up to 7.00 total credit hours.

Requisites: Restricted to Philosophy graduate students only.

PHIL 7415 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for graduate students pursuing a joint PhD in an approved core discipline and cognitive

Requisites: Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

PHIL 7425 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and LING 7425 and PSYC 7425 and SLHS 7428

Requisites: Requires prerequisite course CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade D-).

Recommended: Prerequisite EDUC 6505 or PHIL 6310.

PHIL 7810 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and LING 7775 and PSYC 7775 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

PHIL 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Philosophy graduate students only.

Physics (PHYS)

Courses

PHYS 1000 (3) Preparatory Physics

Introduces basic physics, emphasizing an analytical approach to prepare for PHYS 1110 and PHYS 1120, the engineering majors sequence.

Does not satisfy any MAPS deficiency in either the sciences or math.

Department enforced prerequisite: 1 year high school algebra.

Additional Information: Arts Sci Core Curr: MAPS Course

PHYS 1010 (3) Physics of Everyday Life 1

Intended primarily for nonscientists, this course covers physics encountered in everyday life. Topics include balls, scales, balloons, stoves, insulation, light bulbs, clocks, nuclear weapons, basics of flashlights, and microwave ovens. Department enforced prereq., high school algebra or equivalent. This course should not be taken if the student has a MAPS deficiency in math.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1020 (4) Physics of Everyday Life 2

Intended primarily for nonscientists, this course is a continuation of PHYS 1010. Includes electrical power generation and distribution, electrical motors, radio, television, computers, copiers, lasers, fluorescent lights, cameras, and medical imaging. Department enforced prereq., high school algebra.

Requisites: Requires prerequisite course of PHYS 1010 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Quant Reasn Mathmat Skills

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

PHYS 1110 (4) General Physics 1

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. First semester of three-semester sequence for science and engineering students. Covers kinematics, dynamics, momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1110

Requisites: Requires prerequisite or a corequisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

PHYS 1115 (4) General Physics 1 for Majors

First semester of three semester sequence for physics, engineering physics and astronomy majors. Covers kinematics, dynamics momentum of particles and rigid bodies, work and energy, gravitation, simple harmonic motion and introduction to thermodynamics.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1110

Requisites: Requires a prerequisite or co-requisite course of APPM 1345 or APPM 1350 or MATH 1300 or MATH 1310 (minimum grade C-).

Restricted to Physics (PHYS-BA) or Engineering Physics (EPEN-BS) or Astronomy (ASTR-BA) majors only.

Grading Basis: Letter Grade

PHYS 1120 (4) General Physics 2

Three lect., one rec. per week, plus three evening exams in the fall and spring semesters. Second semester of three-semester introductory sequence for science and engineering students. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1125

Requisites: Requires prerequisite courses of PHYS 1110 or PHYS 1115 and a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade of C-).

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Sequence

PHYS 1125 (4) General Physics 2 for Majors

Three lect., one rec per week, plus three evening exams in the fall and spring semesters. Second semester of three semester introductory sequence for physics, engineering and astronomy majors. Covers electricity and magnetism, wave motion and optics. Normally is taken concurrently with PHYS 1140.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 1120

Requisites: Requires a prerequisite course of PHYS 1110 or PHYS 1115.

Requires a prerequisite or corequisite course of APPM 1360 or MATH 2300 (all minimum grade C-). Restricted to Physics (BA), Engineering Physics (BS) and Astrophysics (BA) students only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Natural Science Sequence

PHYS 1140 (1) Experimental Physics 1

One lect., one 2-hour lab per week. Introduction to experimental physics through laboratory observations of a wide range of phenomena. Covers experiments on physical measurements, linear and rotational mechanics, harmonic motion, wave motion, sound and heat, electricity and magnetism, optics, and electromagnetic waves with the mathematical analysis of physical errors associated with the experimental process.

Requisites: Requires a prerequisite or corequisite course of PHYS 1120 or PHYS 1125 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Lab

PHYS 1230 (3) Light and Color for Nonscientists

Discusses light, color, vision, and perception. Covers reflection, refraction, lenses, and applications to photography and other methods of light sensing. Other topics include lasers and holography. Course is geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1240 (3) Sound and Music

Explores the physical processes that underlie the diversity of sound and musical phenomena. Topics covered include the physical nature of sound, the perception of sound, the perception of pitch and harmony, musical instruments, synthesizers and samplers, and room acoustics. Geared toward nonscience majors. Department enforced prereq., high school algebra or equivalent. Should not be taken by students with a math MAPS deficiency.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci:Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

MAPS Course: Chemistry

MAPS Course: Physics

PHYS 1400 (1) Fundamentals of Scientific Inquiry

Explore and discuss the nature of science and what it means to work in science, technology, engineering or math. Focus on relevant open questions in these fields and the methods used to investigate them. For more information visit: www.colorado.edu/studentgroups/cuprime.

PHYS 1580 (3) Energy and Interactions

Engages non-physics majors in hands-on, minds-on activities and labs to investigate the physical world, the nature of science, and how science knowledge is constructed. This introductory course is especially relevant for future elementary and middle school teachers although it will meet the needs of most non-physics and non-science majors. Physical content focuses on interactions and energy.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 1580

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

PHYS 2010 (5) General Physics 1

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers mechanics, heat and sound. Thorough presentation of fundamental facts and principles of physics using algebra and trigonometry. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020. Department enforced prerequisites: ability to use high school algebra and trigonometry.

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

MAPS Course: Natural Science

PHYS 2020 (5) General Physics 2

Includes three lectures, one two-hour laboratory/recitation per week, plus three evening exams in the fall and spring semesters. Covers electricity and magnetism, light and modern physics. Designed for life science majors, including premed students. Natural science majors with a knowledge of calculus and others taking calculus are urged to take the calculus-based courses PHYS 1110, PHYS 1120, PHYS 1140 and PHYS 2130, rather than PHYS 2010 and PHYS 2020.

Requisites: Requires a prerequisite course of PHYS 1110 or PHYS 2010 (minimum grade C-).

Additional Information: GT Pathways: GT-SC1 - Natural Physcal Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

PHYS 2130 (3) General Physics 3

Covers special relativity, quantum theory, atomic physics, solid state and nuclear physics. Third semester of introductory sequence for science and engineering students. Physics majors should take PHYS 2170 instead of this course. Normally taken with PHYS 2150.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 2170

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

PHYS 2150 (1) Experimental Physics 2

One lect., one 2-hour lab per week. Includes many experiments of modern physics, including atomic physics, solid state physics, electron diffraction, radioactivity and quantum effects. Normally taken concurrently with PHYS 2130 or PHYS 2170, this course may be taken after PHYS 2130 or PHYS 2170.

Requisites: Requires a prerequisite course of PHYS 1140 and a prerequisite or corequisite course of PHYS 2130 or PHYS 2170 (all minimum grade C-).

PHYS 2170 (3) Foundations of Modern Physics

Covers special relativity, quantum mechanics and atomic structure. Completes the three-semester sequence of general physics for physics and engineering physics majors. Normally taken with the laboratory PHYS 2150.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 2130

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 1125, and a prerequisite or corequisite course of MATH 2400 or APPM 2350 (all minimum grade C-).

PHYS 2210 (3) Classical Mechanics and Mathematical Methods 1

Theoretical Newtonian mechanics, including position and velocity dependent forces, oscillation, stability, non-inertial frames and gravitation from extended bodies. Ordinary differential equations, vector algebra, curvilinear coordinates, complex numbers, and Fourier series will be introduced in the context of the mechanics.

Requisites: Requires a prerequisite course of PHYS 2130 or PHYS 2170 and a prerequisite or corequisite course of APPM 2360 or MATH 3430 (all minimum grade C-).

PHYS 2840 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 3000 (3) Science and Public Policy

For nonscience majors. Reading, discussions, debates and lectures are used to study how science affects society economically, intellectually, and in terms of health and national security. Another focus is how government fosters and funds scientific activities. Department enforced prerequisite: completion of core science requirement.

PHYS 3050 (3) Writing in Physics: Problem-Solving and Rhetoric

Teaches strategies used in scientific writing with an emphasis on argument, reviews and reinforces essential writing skills, provides experience in writing both academic and professional communications in a style appropriate to the literature of physics. Department enforced prerequisite: lower-division core writing requirement.

Requisites: Requires a prerequisite course of PHYS 2130 or PHYS 2170 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Written Communication

PHYS 3070 (3) Energy and the Environment

Contemporary issues in energy consumption and its environmental impact, including fossil fuel use and depletion; nuclear energy and waste disposal; solar, wind, hydroelectric, and other renewable sources; home heating; energy storage; fuel cells; and alternative transportation vehicles. Included are some basic physical concepts and principles that often constrain choices. No background in physics is required.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3070

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence

PHYS 3210 (3) Classical Mechanics and Mathematical Methods 2

Lagrangian and Hamiltonian treatment of theoretical mechanics, including coupled oscillations, waves in continuous media, central force motion, rigid body motion and fluid dynamics. The calculus of variations, linear algebra, tensor algebra, vector calculus, and partial differential equations will be introduced in the context of the mechanics.

Requisites: Requires a prerequisite course of PHYS 2210 (minimum grade C-).

PHYS 3220 (3) Quantum Mechanics 1

Introduces quantum mechanics with wave, operator and matrix computational techniques. Investigates solutions for harmonic oscillator, potential well and systems with angular momentum. Develops a quantitative description of one-electron atoms in lowest order.

Requisites: Requires a prerequisite course of PHYS 3210 (minimum grade C-).

PHYS 3221 (1) Tutorial Practicum for Quantum Mechanics 1

Uses interactive group work to aid student learning in co-requisite course PHYS 3220. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

Requisites: Requires a corequisite course of PHYS 3220.

Grading Basis: Pass/Fail

PHYS 3310 (3) Principles of Electricity and Magnetism 1

Covers mathematical theory of electricity and magnetism, including electrostatics, magnetostatics, and polarized media, and provides an introduction to electromagnetic fields, waves, and special relativity.

Requisites: Requires prerequisite courses of PHYS 2210 (minimum grade C-).

PHYS 3311 (1) Tutorial Practicum for Electricity & Magnetism 1

Uses interactive group work to aid student learning in co-requisite course PHYS 3310. In this tutorial, students will work in small groups to practice how to solve challenging problems and their underlying conceptual basis, as well as using hands-on activities, demonstrations, and other techniques to help learn content.

Requisites: Requires a corequisite course of PHYS 3310.

Grading Basis: Pass/Fail

PHYS 3320 (3) Principles of Electricity and Magnetism 2

Continuation of PHYS 3310. Electromagnetic induction; magnetic energy; microscopic theory of magnetic properties; AC circuits; Maxwell's Equations; planewaves; waveguides and transmission lines; radiation from electric and magnetic dipoles and from an accelerated charge.

Requisites: Requires a prerequisite course of PHYS 3310 (minimum grade C-).

PHYS 3330 (2) Electronics for the Physical Sciences

Introduces laboratory electronics for physical science students. Includes basic electronic instruments, dc bridge circuits, operational amplifiers, bipolar transistors, field-effect transistors, photodiodes, noise in electronic circuits, digital logic and microcontrollers. Students gain hands-on experience in designing, building and debugging circuits. Two lectures and one three hour laboratory per week. Concludes with a three-week project in which students design and build an experiment of their choice and present a seminar on the results.

Requisites: Requires prerequisite courses of PHYS 2150 and PHYS 2130 or PHYS 2170 (all minimum grade C-).

PHYS 4130 (3) Biological Electron Microscopy: Principles and Recent Advances

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stem, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5130

Requisites: Requires a prerequisite course of EBIO 1220 or MCDB 1150 or MCDB 4550 or MCDB 5550 or PHYS 1120 or PHYS 2020 (minimum grade D-).

PHYS 4150 (3) Plasma Physics

Discusses the fundamentals of plasma physics, including particle motion in electromagnetic fields, wave propagation, collisions, diffusion, and resistivity. Presents examples from space plasmas, astrophysical plasmas, laboratory fusion plasmas, and plasmas in accelerators.

Requisites: Requires a prerequisite course of PHYS 3310 and a prerequisite or corequisite course of PHYS 3320 (all minimum grade of C-).

PHYS 4230 (3) Thermodynamics and Statistical Mechanics

Statistical mechanics applied to macroscopic physical systems; statistical thermodynamics, classical thermodynamics systems; applications to simple systems. Examines relationship of statistical to thermodynamic points of view.

Requisites: Requires a prerequisite course of PHYS 2210 and a prerequisite or corequisite course of PHYS 3220 (all minimum grade of C-).

PHYS 4340 (3) Introduction to Solid State Physics

Discusses crystal structure, lattice dynamics, band theory, semiconductors and ferromagnetism.

Requisites: Requires a prerequisite course of PHYS 3220 (minimum grade of C-).

PHYS 4410 (3) Quantum Mechanics 2

Extends quantum mechanics to include perturbation theory and its applications to atomic fine structure, multi-particle systems, interactions with external forces, the periodic table and dynamical processes including electromagnetic transition rates.

Requisites: Requires prerequisite courses of PHYS 3220 and PHYS 3310 (all minimum grade of C-).

PHYS 4420 (3) Nuclear and Particle Physics

Introduces structure of the atomic nucleus, spectroscopy of subnuclear particles, scattering, reactions, radioactive decay, fundamental interactions of quarks and leptons.

Requisites: Requires a prerequisite course of PHYS 4410 (minimum grade of C-).

PHYS 4430 (3) Advanced Laboratory

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5430

Requisites: Requires a prerequisite course of PHYS 3330 (minimum grade of C-).

PHYS 4450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5450 and PHIL 4450 and PHIL 5450

Requisites: Requires a prerequisite course of PHYS 1020 or PHYS 1120 or PHYS 1125 or PHYS 2020 (minimum grade of C-).

PHYS 4460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching and education research.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5460 and EDUC 4460 and EDUC 5460

Requisites: Requires prerequisite courses of PHYS 3210 and PHYS 3310 (all minimum grade of C-).

PHYS 4510 (3) Optics

Basic electromagnetic theory of light, using Maxwell's equations. Examples in geometrical optics; extensive applications in physical optics including diffraction and polarization. Spectra, including Zeeman effect and fluorescence. Recent advances in experimental techniques: microwaves, lasers, image converters.

Requisites: Requires a prerequisite course of PHYS 3320 (minimum grade of C-).

PHYS 4550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extra-cellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell. Fulfills MCDB scientific reasoning requirement.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5550 and MCDB 4550 and MCDB 5550

Recommended: Prerequisites MCDB 3135 and MCDB 3145 and PHYS 2010 and PHYS 2020 and CHEM 1133 or MATH 1300 and/or CHEM 3311 (minimum grade C-) or instructor consent required.

PHYS 4560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5560 and MCDB 4560 and MCDB 5560

Requisites: Requires a prerequisites course of PHYS 2210 (minimum grade C-).

Recommended: Prerequisite PHYS 4230.

Grading Basis: Letter Grade

PHYS 4610 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4620 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4620 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4630. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4630 (2) Physics Honors

Students are matched with a faculty member and work independently on a research topic. Typically, the honors program lasts three semesters. A senior thesis and an oral presentation of the work are required. See also PHYS 4610 and PHYS 4620. Department enforced prerequisite: minimum 3.00 GPA. Registration by special arrangement with the Department of Physics.

Additional Information: Arts Sciences Honors Course

PHYS 4810 (1-3) Special Topics in Physics

Various topics not normally covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4840 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4850.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4850 (1-3) Independent Study

Selected topics for undergraduate independent study. Subject matter to be arranged. See also PHYS 4840.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 4970 (3) Seminar on Physical Methods in Biology

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, Eels, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, Pet, Cat), Fourier analysis, synchrotron radiation, Exafs, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 5970

Requisites: Requires a prerequisite course of PHYS 1120 or PHYS 2020 and MCDB 1150 or EBIO 1220 (all minimum grade D-).

PHYS 5030 (3) Intermediate Mathematical Physics 1

This course and its continuation, PHYS 5040, form a survey of classical mathematical physics. Studies complex variable theory and finite vector spaces, and includes topics in ordinary and partial differential equations, boundary value problems, potential theory, and Fourier analysis.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5030

Requisites: Restricted to graduate students only.

PHYS 5040 (3) Intermediate Mathematical Physics 2

Continuation of PHYS 5030. Includes group theory, special functions, integral transforms, integral equations and calculus of variations.

Equivalent - Duplicate Degree Credit Not Granted: MATH 5040

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 5030.

PHYS 5130 (3) Biological Electron Microscopy: Principles and Recent Advances

Covers basic mechanisms for imaging and recent advances used in current biological research, elements of electron optics, image optimization, resolution, radiation damage, various imaging modes (TEM, HVEM, Sem, Stm, Stm), specimen quantitation and reconstruction (stereo and 3-D), microanalysis and electron diffraction. Specimen preparation treated only incidentally.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4130

PHYS 5141 (3) Astrophysical and Space Plasmas

Covers magnetohydrodynamics and a few related areas of plasma physics applied to space and astrophysical systems, including planetary magnetospheres and ionospheres, stars, and interstellar gas in galaxies.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5140

Requisites: Restricted to Physics (PHYS) or Astronomy (ASTR) graduate students only.

PHYS 5150 (3) Introductory Plasma Physics

Includes basic phenomena of ionized gases, static and dynamic shielding, linear waves, instabilities, particles in fields, collisional phenomena, fluid equations, collisionless Boltzman equations, Landau damping, scattering and absorption of radiation in plasmas, elementary nonlinear processes, WKB wave theory, controlled thermonuclear fusion concepts, astrophysical applications and experimental plasma physics (laboratory). Department enforced prerequisite: PHYS 3310. Instructor consent required for undergraduates.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 5150

Requisites: Restricted to graduate students only.

PHYS 5160 (3) Fundamentals of Optics and Lasers

Covers the basic physics of lasers. Topics include basics of optical resonators and gaussian beam propagation, stimulated emission, laser threshold conditions, laser linewidth, q-switching and mode locking of lasers, tuning of Cw lasers, and specifics of various common lasers.

Requisites: Restricted to graduate students only.

PHYS 5210 (3) Theoretical Mechanics

Variational principles, Lagrange's equations, Hamilton's equations, motion of rigid body, relativistic mechanics, transformation theory, continuum mechanics, small oscillations, Hamilton-Jacobi theory.

Requisites: Restricted to graduate students only.

PHYS 5250 (3) Introduction to Quantum Mechanics 1

Quantum phenomena, Ehrenfest theorem and relation to classical physics, applications to one-dimensional problems, operator techniques, angular momentum and its representations, bound states and hydrogen atom, and Stern-Gerlach experiment and spin and spinor wave function. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

Requisites: Restricted to graduate students only.

PHYS 5260 (3) Introduction to Quantum Mechanics 2

Symmetries and conservation laws, identical particle systems, approximation techniques (including time-dependent and time-independent perturbation theories and variational techniques) and their applications, scattering theory, radiative transitions, and helium atom.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 5250.

PHYS 5430 (3) Advanced Laboratory

Two lectures, one lab per week. Experiments introduce students to realities of the experimental physics so they gain a better understanding of theory and an appreciation of the vast amount of experimental work done in the physical sciences today. Department enforced prerequisites: PHYS 3330 and PHYS 3220 and PHYS 3320. Department enforced corequisites: PHYS 4410.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4430

Requisites: Restricted to graduate students only.

PHYS 5450 (3) History and Philosophy of Physics

Investigates the role of experiment in physics; case studies in the history and philosophy of physics and in scientific methodology.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4450 and PHIL 4450 and PHIL 5450

Requisites: Restricted to graduate students only.

PHYS 5460 (3) Teaching and Learning Physics

Learn how people understand key concepts in physics. Through examination of physics content, pedagogy and problems, through teaching, and through research in physics education, students will explore the meaning and means of teaching physics. Students will gain a deeper understanding of how education research is done and how people learn. Useful for all students, especially for those interested in physics, teaching, and education research.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4460 and EDUC 4460 and EDUC 5460

Requisites: Restricted to graduate students only.

PHYS 5550 (3) Cells, Molecules and Tissues: A Biophysical Approach

Focuses on the biophysics governing the structure/function of enzymes, cells, extracellular matrix and tissue. Synthesizes ideas from molecular biology, physics, and biochemistry, emphasizing how low Reynolds number physics, not Newtonian physics, is relevant to life inside a cell.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4550 and MCDB 4550 and MCDB 5500

PHYS 5560 (3) Introduction to Biophysics

Covers an introduction to the physics of living systems. Focuses on how living systems are able to generate order, with both physical principles and biological examples. Covers the development of quantitative models for biological systems, including estimates. Taught from a physics perspective, with biology background introduced as needed.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4560 and MCDB 4560 and MCDB 5560

Grading Basis: Letter Grade

PHYS 5606 (3) Optics Laboratory

Consists of 13 optics experiments that introduce the techniques and devices essential to modern optics, including characterization of sources, photodetectors, modulators, use of interferometers, spectrometers and holograms, and experimentation of fiber optics and Fourier optics.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5606

Recommended: Prerequisite undergraduate optics course such as PHYS 4510.

PHYS 5770 (3) Gravitational Theory (Theory of General Relativity)

Presents Einstein's relativistic theory of gravitation from geometric viewpoint; gives applications to astrophysical problems (gravitational waves, stellar collapse, etc.). Instructor consent required for undergraduates.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites PHYS 3220 and PHYS 3320.

PHYS 5840 (1-3) Selected Topics for Graduate Independent Study

Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 5970 (3) Seminar: Physical Methods in Biology

Covers basic mechanisms and applications of physical methods used in current biological research, microprobe analysis, EELS, elementary electron and x-ray crystallography, biomedical imaging (NMR, MRI, PET, CAT), Fourier analysis, synchrotron radiation, EXAFS, neutron scattering and novel ultramicroscopy techniques. Includes lectures, student presentations, occasional demonstrations. Emphasis depends on student interest.

Equivalent - Duplicate Degree Credit Not Granted: PHYS 4970

Requisites: Restricted to graduate students only.

PHYS 6260 (3) Geometry of Quantum Fields and Strings

Focuses on differential geometric techniques in quantum field and string theories. Topics include: spinors, Dirac operators, index theorem, anomalies, geometry of superspace, supersymmetric quantum mechanics and field theory and nonperturbative aspects in field and string theories.

Equivalent - Duplicate Degree Credit Not Granted: MATH 6260

Recommended: Prerequisites MATH 6230 and PHYS 5250 and MATH 6240 and PHYS 7280.

PHYS 6610 (3) Earth and Planetary Physics 1

Examines mechanics of deformable materials, with applications to earthquake processes. Introduces seismic wave theory. Other topics include inversion of seismic data for the structure, composition and state of the interior of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6610 and ASTR 6610

Requisites: Restricted to graduate students only.

PHYS 6620 (3) Earth and Planetary Physics 2

Covers space and surface geodetic techniques as well as potential theory. Other topics are the definition and geophysical interpretation of the geoid and of surface gravity anomalies; isostasy; post-glacial rebound; and tides and the rotation of the Earth.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6620 and ASTR 6620

Requisites: Restricted to graduate students only.

PHYS 6630 (3) Earth and Planetary Physics 3

Examines the solar system, emphasizing theories of its origin and meteorites. Highlights distribution of radioactive materials, age dating, heat flow through continents and the ocean floor, internal temperature distribution in the Earth, and mantle convection. Also covers the origin of the oceans and atmosphere.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6630 and ASTR 6630

Requisites: Restricted to graduate students only.

PHYS 6650 (1-3) Seminar in Geophysics

Advanced seminar studies in geophysical subjects for graduate students.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6650 and GEOL 6650

Requisites: Restricted to graduate students only.

PHYS 6670 (2) Geophysical Inverse Theory

Principles of geophysical inverse theory as applied to problems in the Earth sciences, including topography, Earth structure and earthquake locations.

Equivalent - Duplicate Degree Credit Not Granted: GEOL 6670

Requisites: Restricted to graduate students only.

Recommended: Prerequisites a course in calculus and a course in computer programming (any language).

PHYS 6940 (1) Master's Degree Candidate

Grading Basis: Pass/Fail

PHYS 6950 (1-6) Master's Thesis

Approved problem in theoretical or experimental physics under the direction of staff members. Intended to introduce the student to procedures in research and development work. Work of an original nature expected.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

PHYS 7160 (3) Intermediate Plasma Physics

Continuation of PHYS 5150. Topics vary yearly but include nonlinear effects such as wave coupling, quasilinear relaxation, particle trapping, nonlinear Landau damping, collisionless shocks, solutions; nonneutral plasmas; kinetic theory of waves in a magnetized plasma; anisotropy; inhomogeneity; radiation-ponderomotive force, parametric instabilities, stimulated scattering; plasma optics; kinetic theory and fluctuation phenomena.

Equivalent - Duplicate Degree Credit Not Granted: ASTR 7160

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 5150.

PHYS 7230 (3) Statistical Mechanics

Classical and quantum statistical theory, including study of both equilibrium and nonequilibrium systems. Topics covered include kinetic theory, degenerate gases, macrocanonical and grand canonical ensembles, and irreversible processes. Department enforced prerequisite: advanced undergraduate quantum mechanics course.

Requisites: Restricted to graduate students only.

PHYS 7240 (3) Advanced Statistical Mechanics

Introduces current research topics in statistical mechanics. Topics vary from year to year and may include phase transitions, critical phenomena, nonequilibrium phenomena, dense fluids, dynamical systems, plasma physics, or quantum statistical mechanics.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 7230.

PHYS 7250 (3) Quantum Many Body Theory

Theory of quantum many body systems, including methods based on Green's functions, Feynman diagrams, and coherent state path integral with applications to interacting quantum gases, superconductivity and superfluidity, quantum phase transitions, quantum magnetism, quantum motion in the presence of disorder, and topological states of matter.

Requisites: Restricted to graduate students only.

PHYS 7270 (3) Introduction to Quantum Mechanics 3

Radiation theory; relativistic wave equations with simple applications; introduction to field theory and second quantization.

Requisites: Restricted to graduate students only.

PHYS 7280 (3) Advanced Quantum Theory

Quantum theory of fields, elementary particles, symmetry laws, and topics of special interest.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 7270 or instructor consent required.

PHYS 7310 (3) Electromagnetic Theory 1

Sophisticated approach to electrostatics, boundary value problems, magnetostatics, applications of Maxwell's equations to electromagnetic wave propagation, wave guides, and resonant cavities and magnetohydrodynamics.

Requisites: Restricted to graduate students only.

PHYS 7320 (3) Electromagnetic Theory 2

Continuation of PHYS 7310. Topics include relativistic particle dynamics; radiation by moving charges; multiple fields; radiation damping and self-fields of a particle; collisions between charged particles and energy loss; radiative processes; and classical field theory.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PHYS 7310.

PHYS 7430 (3) Soften Condensed Matter Physics

Introduces the science of liquid crystals, polymers, biological membranes, biopolymers, block copolymers, molecular monolayers, colloids, nanoparticle suspensions, emulsions, foams, gels, elastomers and other soft materials. Topics vary from semester to semester and is geared toward graduate students with diverse preparation backgrounds, including students from the Department of Physics, as well as other science and engineering departments.

Requisites: Restricted to graduate students only.

PHYS 7440 (3) Theory of the Solid State

Stresses application to the solid state of physical concepts basic to much of modern physics, single-particle approximation, and the energy-band description of electron states in solids, pseudopotential theory applied to ordered and disordered systems, dynamical behavior of electrons in solids, lattice dynamics, Hartree-Fock and random-phase approximation in solids, many-body aspects of magnetism, and superconductivity.

Requisites: Restricted to graduate students only.

PHYS 7450 (3) Theory of Solid State 2

Second semester of condensed matter physics, covers topics in soft condensed matter physics, liquid crystals, semiconductors, Quantum Hall effect, Fractional Quantum Hall effect, superconductivity and other topics at the discretion of the instructor.

Requisites: Restricted to graduate students only.

PHYS 7550 (3) Atomic and Molecular Spectra

Covers theory of atomic structure and spectra, including coupling of angular momenta, tensor operators, energy levels, fine and hyperfine structure, transition probabilities, Zeeman and Stark effects. Molecular spectra: electronic, vibrational, and rotational states. Rotation matrices, symmetric top.

Requisites: Restricted to graduate students only.

PHYS 7560 (3) Quantum Optics

Covers quantum optical and atomic systems including topics such as: coherent and squeezed states, theory of optical coherence, atom-radiation interaction, optical Bloch equations, open quantum systems, dynamics on the Bloch sphere, resonance fluorescence, beam-splitters and interferometry, entanglement and quantum information.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites PHYS 3220 and PHYS 4410.

PHYS 7650 (3) Nonlinear and Nano-Optics

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include: description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their integration, measurement and manipulation and their use in applications including spectroscopy.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites PHYS 4510 or PHYS 5160.

Grading Basis: Letter Grade

PHYS 7660 (3) Ultrafast Optics

Covers the field of ultrafast optics including both experimental and theoretical aspects. Topics include description of ultrashort optical pulses, propagation of pulses including dispersion and nonlinearity, their generation, measurement and manipulation and their use in applications including spectroscopy. Department enforced prerequisite: PHYS 5160, or PHYS 4510, or ECEN 5645.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

PHYS 7730 (3) Theory of Elementary Particles

Systematics of elementary particles, leptons, quarks, gauge bosons, symmetries and symmetry breaking, scattering cross sections, decay rates, electron-positron annihilation, lepton scattering and hadron structure, quantum chromodynamics, electroweak interactions, gauge theories.

Requisites: Restricted to graduate students only.

PHYS 7810 (1-3) Special Topics in Physics

Various topics not normally covered in the curriculum; offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHYS 7820 (3) Topics in Scientific Writing

Teaches strategies used in scientific writing with emphasis on problem statement, audience analysis and principles of sound argument; reviews and reinforces essential writing skills, stressing the need for careful and strategic revision; provides experience in writing academic and professional communications; presentation skills and proposal writing. Most appropriate for students beginning to write journal articles, Comps II paper, or dissertation chapter.

Requisites: Restricted to graduate students only.

PHYS 7830 (1-3) Plasma Seminar

One credit 'journal club' style course covering current and significant historical advances in plasma physics research. Each week the class is assigned a journal article to read in advance of the meeting and one student is selected (on a rotating basis) to present a synopsis and lead a round-table discussion. Cannot be used for minimum credit hour requirements of graduate program. See also PHYS 7810 and PHYS 7820. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

PHYS 7840 (1-3) Selected Topics for Graduate Independent Study

Subject matter to be arranged.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 7850 (1-3) Selected Topics for Graduate Independent Study

Subject matter to be arranged. May be repeated for a total of 7 credit hours.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

PHYS 7915 (1) Seminar Topics in Physics

Various seminar topics not normally covered in the curriculum: offered intermittently depending on student demand and availability of instructors.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

PHYS 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Political Science (PSCI)

Courses

PSCI 1101 (3) Introduction to American Politics

Emphasizes interrelations among levels and branches of government, formal and informal institutions, processes, and behavior.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Arts Sci Core Curr: United States Context

Departmental Category: American

MAPS Course: Social Science

MAPS Course: Social Science US Context

PSCI 2004 (3) Survey of Western Political Thought

Studies main political philosophies and political issues of Western culture, from antiquity to 20th century.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Ideals and Values

Departmental Category: Political Theory

PSCI 2012 (3) Introduction to Comparative Politics

Most countries confront a variety of common political problems, including how to gain popular support, what kinds of political institutions are most appropriate, and how to distribute burdens and benefits to different segments of the population. Concentrates on learning how to compare different political systems and provides illustrative examples from several countries in both the industrialized and nonindustrialized world.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Comparative

PSCI 2028 (3) Special Topics

Offers subjects not covered by existing courses. Offered when department approves a special topic.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSCI 2075 (3) Quantitative Research Methods

Introduces quantitative research methods used in political science.

Focuses on basic tools of analysis: data collection, processing, and evaluation, with special attention to survey techniques. Includes elite and case study analysis; aggregate, cluster, and content analysis; and the use of computers in political research.

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Empirical Theory and Research Methodology

PSCI 2106 (3) Introduction to Public Policy Analysis

Studies policymaking processes in American government, factors shaping public decision, and issues and questions relevant to political inquiry.

Additional Information: Departmental Category: Public Policy

PSCI 2116 (3) Introduction to Environmental Policy and Policy Analysis

Teaches a systematic general framework for the analysis of environmental policy issues. Analyzes the interaction of environmental sciences, ethics, and policy across a range of environmental policy problems. Stresses critical thinking and practical applications.

Additional Information: Departmental Category: Public Policy

PSCI 2223 (3) Introduction to International Relations

Introduces the field of international relations, with general survey of the theories, histories, and problems of historical and contemporary relations among state and nonstate actors.

Additional Information: GT Pathways: GT-SS1 - Soc Behav Sci: Econ or Pol Systems

Arts Sci Core Curr: Contemporary Societies

Departmental Category: International Relations

PSCI 2481 (3) Introduction to the Legal Process

Covers basic legal concepts and processes emphasizing the American system. Gives special attention to political functions of law. Recommended as preparation for PSCI 4241.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3011 (3) The American Presidency and the Executive Branch

Examines the constitutional, institutional and historical development of the presidency and the federal bureaucracy. Explores the changing role of the executive branch in the U.S. political system over time and competing views of executive power.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: American

PSCI 3021 (3) U.S. Campaigns and Elections

Introduces students to the subjects, techniques, and findings of Political Science research on campaigns and elections. Particular emphasis is placed on the study of voting, campaign effects, partisan coalitions, electoral rules, campaign finance, and the policy impact of elections.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: American

PSCI 3022 (3) Russian Politics

Examines the development of Russian politics from the late Soviet period to the present. Topics covered include political culture, democratic transition, economic reform, and social problems in Russia.

Additional Information: Arts Sci Core Curr: Contemporary Societies

Departmental Category: Comparative

PSCI 3031 (3) Political Parties and Interest Groups

Highlights the practice of party politics in the United States, including the nature, structure, organization, and functions of political parties and interest groups. Analyzes interest group politics and political behavior.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3032 (3) Democracy, Inequality and Violence in Latin America

Stresses different perspectives on Latin American politics and understanding key political actors and processes. Country focus varies.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 3041 (3) The American Congress

Provides intensive examination of the role of Congress in American government, including congressional elections, representation, the organization of Congress, and congressional policy making. Examines larger context of congressional politics, including political parties, the president, and interest groups.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3051 (3) Public Opinion and Political Behavior

Examines measurement of public opinion and evaluation of its impact on governmental policy formation, including survey research techniques.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3052 (3) Gender and Politics in Latin America

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution, and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations, and the differential impact of political, economic, and social changes on men and women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3650

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2600 or PSCI 3032.

Additional Information: Departmental Category: Comparative

PSCI 3054 (3) American Political Thought

Highlights the development of American political theories and ideas from colonial period to present. Can also be taken for American field credit.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004.

Additional Information: Arts Sci Core Curr: United States Context
Arts Sci Core Curr: Ideals and Values
Departmental Category: Political Theory

PSCI 3061 (3) State Government and Politics

Examines politics in the American states from a comparative and historical perspective. Considers major political actors—interest groups, citizens (direct democracy), and political parties, as well as central institutions, in the state political arena. Also focuses on major state public policy concerns.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American

PSCI 3062 (3) Revolution and Political Violence

Studies and evaluates alternative theoretical frameworks for the analysis of revolution and political violence. Theoretical material is firmly couched in case situations, such as ethnic, class, colonial, urban, racial, and religious conflicts.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101 or PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative

PSCI 3064 (3) Environmental Political Theory

Examines environmental discourses as conceptual means for theorizing environmental politics, and applies normative political theories to contemporary environmental policy issues. Considers the roles of political actors (individuals, groups, the state) in defining and addressing environmental problems on local, national, and global levels.

Equivalent - Duplicate Degree Credit Not Granted: ENV 3064

Recommended: Prerequisite PSCI 2004.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Political Theory

PSCI 3071 (3) Urban Politics

Examines the structure of political, social, and economic influence in urban areas. Focuses on the relationship of the political system to governmental, social, and economic institutions and the contemporary policy processes in American cities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: American

PSCI 3072 (3) Government and Politics in Southeast Asia

Surveys historical and contemporary forces shaping politics in Southeast Asia. Gives special attention to comparative political economy, including development strategies and transitions to democracy.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 3074 (3) Democracy and Its Citizens in the US and EU

Studies theories and problems related to citizenship in the US and the EU. This includes rights and restrictions of citizenship, issues of immigration, multicultural citizenship, globalization and citizenship. In the EU the relation between member nation citizenship and EU citizenship is a special problem. Examines how the US and EU compare.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Political Theory

PSCI 3082 (3) Political Systems of Sub-Saharan Africa

Analyzes post-independence and post-Cold War change in sub-Saharan Africa and provides intensive case studies of selected countries exemplifying each type with South Africa seen as a special case.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 3084 (3) Diversity, Disagreement, and Democracy: an Introduction to the Theory and Practice of Democracy

Examines the justification and limits for moral, political and religious pluralism. Students will be trained in the practice of dialogue and research the historical context of a subject that would be appropriate for a dialogue, and then interview members of the community who have different perspectives on the subject.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Political Theory

PSCI 3091 (3) Politics of Social Movements

Examines theoretical and empirical research on social movements from a U.S. perspective. Considers why social movements arise, who participates in them, the tactics they employ, obstacles they face, and their political impact.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3092 (3) Comparative Political Economy

Presents theories on the interaction between policies and economics, economic models of politics, and familiarizes students with an approach that will prove useful in understanding current developments in both economics and politics. Explores relationships between financial markets, currency regimes and politics with some special consideration of the behavioral foundations of political and economic developments. Recommended prerequisite: PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 3101 (3) Black Politics

Examines structure of political, social, and economic influence in urban areas. Focuses on the relationship of political processes to governmental, social, and economic institutions and contemporary policy processes in American cities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American

PSCI 3102 (3) South Asian Politics

Examine the diverse political trajectories of four South Asian countries: India, Pakistan, Nepal, and Sri Lanka. Using a comparative lens, we will take into account historical, cultural, and economic, in addition to political, factors in deciphering this diversity of political paths.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 3105 (3) Designing Social Inquiry: An Introduction to Analyzing Political Phenomena

Tackles conceptualization and measurement with a focus on reliability and validity of measures at the individual level. Explores how improper measurement and conceptualization can affect our inferences.

Investigates how to use the tools of causal logic with statistical tools to differentiate linear, spurious, intervening and conditional relationships with a particular focus on what it means to "control for other factors".

Requisites: Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Quant Reasn Mathmat Skills
Departmental Category: Empirical Theory and Research Methodology

PSCI 3123 (3) War, Peace, and Strategic Defense

Analyzes employment, or the threat of employing force, in securing American interests in the post-Cold War world. Gives special attention to utilities claimed for nuclear weapons, and alternatively, to weapons control and disarmament.

Equivalent - Duplicate Degree Credit Not Granted: PACS 3800

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 3143 (3) Current Affairs in International Relations

Analyzes the various theoretical and policy challenges facing the post-Cold War world, with an emphasis on examining alternative conceptions of and approaches to such challenges.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: International Relations

PSCI 3155 (3) Survey Design and Analysis

Provides the unique experience of involvement in ongoing survey research. Designed for students from different disciplines who will learn about what makes a good versus bad survey, how to write effective questions and how to put survey questions together into a cohesive questionnaire. Gain insight into the pitfalls of survey research and how to overcome them. Provides hands-on, real world experience on the design, implementation and analysis of the annual Colorado Political Climate survey.

Requisites: Requires prerequisite course of PSCI 2075 (minimum grade C-).

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 3163 (3) American Foreign Policy

Examines foundations, assumptions, objectives, dynamics, and methods of U.S. foreign policy since WWII. Gives special attention to domestic and external problems of adapting U.S. policy to the changing world environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: International Relations

PSCI 3174 (3) Sex, Power, and Politics: U.S. Perspectives

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted, and changed by studying the politics of the women's, gay liberation, and men's movements in the U.S.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3174

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

Additional Information: Departmental Category: Political Theory

PSCI 3191 (3) National Security Organization and Policy Making

Analyzes how the American governmental and political system is structured to define, select, and implement national security policies. Examines roles of the president, Congress, bureaucracy, interest groups, and other actors.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3193 (3) International Behavior

Presents alternate theoretical frameworks for the explanation of international processes. Applies theories of conflict behavior and social organization to problems of war and peace.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 3205 (3) Undergrad Research Fellowship

Broadens and strengthens social science methodological skills and training by providing individualized instruction and research collaboration between the student and advanced graduate students and faculty. Promotes hands-on learning, immersion in the research process, and professional relationships with faculty. Includes a classroom component and a research opportunity in collaboration with a mentor.

Requisites: Requires prerequisite course of PSCI 2075 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Political Science (PSCI) majors or minors only. Restricted to students with a cumulative GPA of 3.4 or higher.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 3206 (3) The Environment and Public Policy

Considers constitutional, political, and geographic factors in development of public policy affecting the use of natural resources and management of the environment; organization, procedures, and programs for use of natural resources; and administration of environmental policies.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101 or PSCI 2012.

Additional Information: Departmental Category: Public Policy

PSCI 3211 (3) The Politics of Economic Inequality in the United States

Explores empirical and normative origins and current state of economic inequality in the United States from a political science perspective.

Evaluates how ideas about democracy and public policy address economic inequality, including the roles of gender, race and class in inequality. Examines the relationship between economic inequality and political inequality in both political behavior and political institutions.

Requisites: Requires a prerequisite course of PSCI 1101 (minimum grade D-).

Additional Information: Departmental Category: American

PSCI 3225 (3) Strategy and Politics

Focuses on the rational choice approach to understanding political decision making. Introduces students to the tools and methods of game-theoretic reasoning, and examines the strategic logic of many forms of political decision-making, including voting, lawmaking, and international conflict.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 3271 (3) Law and Society: Legal Institutions and Human Behavior

Examines relationship between human behavior and legal system, looking closely at the voluntary relationship between the citizen and the state, the use of law to balance economic liberty and equality, support for civil liberties, and procedural, distributive, and retributive justice.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 3274 (3) Capitalism and its Critics

Examines competing theoretical approaches to questions related to origins, development, and purposes of modern government in the United States; particular attention paid to impact of transformations in the underlying structure of the capitalist economy. Formerly PSCI 3171.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: Political Theory

PSCI 3281 (3) Development of American Political Institutions

Learn about the evolution of major American political institutions including the presidency, Congress, the judiciary, the party system and the right to vote.

Grading Basis: Letter Grade

Additional Information: Departmental Category: American

PSCI 3301 (3) Gender, Sexuality and U.S. Law

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; and discrimination based on sex and sexual orientation in education and in the workplace.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3300

Recommended: Prerequisite PSCI 1101 or WGST 2000.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: American

PSCI 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office, and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation, and other identities in U.S. politics.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3311

Additional Information: Departmental Category: American

PSCI 3774 (3) Free Speech and Dangerous Ideas

Examines in depth various philosophical and legal justifications of First Amendment rights of speech, press, association and religion. Assesses these justifications in relation to broader normative theories of liberal democracy. Can also be taken for American field credit. Formerly PSCI 4774.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites PSCI 2004 and PSCI 2481.

Additional Information: Departmental Category: Political Theory

PSCI 4002 (3) Western European Politics

Comparatively analyzes development of the political systems and processes of European democracies. Emphasizes contemporary institutions, decision making patterns, and policy issues. Special attention to challenges of welfare systems.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4012 (3) Global Development

Analyzes development theory, case studies in development strategies, and the problems and promises of development: specifically issues of gender, environment, labor, corruption and poverty. The primary focus is on explanations for variation in level of development over time and across countries.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4022 (3) Chinese Foreign Policy

History of China's external relations and theories of foreign policy decision making. Explores two vital bilateral relations (Sino-U.S. and Sino-Japanese) and several key issues (like Taiwan) in China's 21st century foreign policy.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 4024 (3) Senior Seminar in Political Theory

Intensively analyzes and discusses major theories and issues of both contemporary political thought and the history of political philosophy. The topic is announced by the instructor, but might include analysis of concepts (justice, human rights, democracy, etc.) or major theories. Emphasizes advanced discussion plus individual research.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4028 (3) Special Topics

Offers subjects not covered by existing courses. Offered when the department approves a special topic.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: General

PSCI 4052 (3) Chinese Politics

Explores the politics of 20th century China to speculate on China's future in the 21st century. Begins with an extensive look at the political history of the People's Republic, before turning to social, cultural, economic, and political issues today. Concludes with an examination of Chinese foreign policy, with a focus on Sino-American relations.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 4062 (3) East European Politics

Studies developments in the former Soviet satellites and Yugoslavia, their governmental organizations, and their relation to the former Soviet Union and the West.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4106 (3) Issues and Challenges in American Green Energy Policy

Explores growth of contemporary American green energy industry. Explores different types of green energy policies and how government institutions and regularly arrangements affect the development of green energy policy.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 4131 (3) Latinos and the U.S. Political System

Examines the political status and activities of Mexican Americans and other Latino groups (Cuban Americans and Puerto Ricans) in the U.S. Also covers Latino political attitudes and behaviors; Latino efforts to influence the major national, state, and local institutions of the American government; and public policy concerns of Latinos.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: American

PSCI 4173 (3) International Cooperation and Global Anarchy

Explores if and how countries cooperate in a world with no government. Investigates cooperation over a number of international issues, including peace and security, trade and development, climate change, human rights, and justice for victims of war crimes. Gives special attention to organizations including the United Nations, International Monetary Fund, European Union and World Trade Organization.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: International Relations

PSCI 4183 (3) International Law

Investigates the body of law that regulates relations between nation states and provides a framework for the solving of common problems. Explores its nature and effectiveness as well as its adaptability to a changing environment.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4193 (3) International Political Economy

Analyzes issues at the intersection of international politics and international economics. Utilizes theories and concepts from both economics and political science to understand issues in trade, finance, development and migration.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4213 (3) Europe and the International System

Covers the past, present and future of Europe's global role.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4221 (3) Political Psychology

Examines the psychological foundations of political decision-making among citizens and elites. Considers the role of political psychology in explaining political behavior and outcomes at the individual and collective level.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4241 (3) Constitutional Law

Focuses on the nature and scope of American constitutional principles as developed by the U.S. Supreme Court, including federalism, separation of powers, commerce, due process and equal protection.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4242 (3) Middle Eastern Politics

Explores the domestic politics of various Middle Eastern countries as well as the development and globalization of the region. Includes topics such as the ongoing prevalence of dictatorships, political Islamism, oil politics, economic growth and stagnation, and relations with the U.S.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative
Departmental Category: Asia Content

PSCI 4243 (3) Modern Warfare: Terrorism, Ideology, Identity

Explores the evolution of warfare and origins of terrorism. Ideological and identity differences have come to the forefront of violent political conflicts while the emerging doctrine of warfare has placed civilians in the middle of modern conflicts. Tracks potential changes in the means of and reasons for fighting, roles of civilians and media, and rules of war.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisites PSCI 2223 and PSCI 3193.

Additional Information: Departmental Category: International Relations

PSCI 4252 (3) Politics of Ethnicity and Nationalism

Analyzes ethnic identity as a factor in contemporary politics. Deals extensively with the role of ethnic groups in political mobilization, the development of national collective consciousness, nation building, and international relations. Explores the influence of religion, language, history, culture and class on ethnic group formation and behavior.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 4253 (3) Politics of Identity and Inter-Ethnic Violence

Discusses politics of identity and why identity is such a potent source of violence. Is inter-ethnic conflict an end in itself, or are ethnic groups trying to achieve other goals through violence? What can be done to prevent or ameliorate inter-ethnic strife? Examines theoretical aspects of identity, inter-ethnic conflict, as well as specific examples of ethnic crises.

Recommended: Prerequisite PSCI 2223 or PSCI 2012.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Relations

PSCI 4283 (3) International Migration and Policy

Explores the politics of international migration, including public attitudes toward immigration, special interests politics of immigration policy making and the dynamics between political institutions and international migrations. Students will learn about the politics of international migration across different receiving and sending states over the past two centuries with an emphasis on the current debates over immigration in the U.S. and Western Europe.

Additional Information: Departmental Category: International Relations

PSCI 4302 (3) European Union Politics

Explores the development, functioning, focus and future of the European Union. Examines history, institutions, policies and politics as well as governance theories that have been developed to explain origins and evolution of the EU.

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 4341 (3) Media and Politics

Examines aspects of political communication as it applies to citizens, political decision makers, and specific public policies.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4391 (3) Gender Politics and Global Activism

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional, and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4500

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Departmental Category: American

PSCI 4701 (3) Symbolic Politics

Introduces uses and abuses of symbols as instruments and indicators of political change.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4703 (3) Alternative World Futures

Aims to help students think about the future of the world in a systematic way. Focuses on alternative projections and policies dealing with major problems.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4714 (3) Liberalism and Its Critics

Examines contemporary arguments for and against liberalism. Focuses on the analysis, evaluation, and understanding of the philosophical contributions to this debate. Gives special attention to the concepts of justice, freedom, equality, and individualism.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4715 (3) Honors Political Science Seminar

Involves writing and discussion of selected topics in political science. Critically reviews the major methodological and conceptual features of the discipline. Students begin their honors papers in the seminar. Department enforced prerequisite: minimum 3.3 GPA. Generally offered in fall term only.

Additional Information: Arts Sciences Honors Course

Departmental Category: Empirical Theory and Research Methodology

PSCI 4716 (3) Selected Policy Problems

Integrates general principles of policy inquiry with documents and other literature on specific problems in public policy, in order to evaluate courses of action.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Public Policy

PSCI 4725 (3) Political Science Honors Thesis

Involves writing an honors thesis. Formerly PSCI 4008.

Requisites: Requires prerequisite course of PSCI 4715 (minimum grade B-).

Additional Information: Arts Sciences Honors Course

Departmental Category: Empirical Theory and Research Methodology

PSCI 4731 (3) Civic Engagement in America

Closely examines the various understandings of democracy, the arguments for and against democracy, and the progress of and prospects for democratic politics in the United States. Particular attention is paid to economic, social, and political developments in the United States that affect popular sovereignty, political equality, and liberty.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4732 (3) Critical Thinking in Development

Exposes students to current issues in the political economy of development. Subjects range from globalization, democratization and economic development. Specifically explores the international and domestic determinants of economic development with special reference to currency markets, foreign direct investment, trade and democratization.

Equivalent - Duplicate Degree Credit Not Granted: INVS 4302

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 2012.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Comparative

PSCI 4734 (3) Politics and Literature

Broadly examines political topics as they are presented in important literary works and analyzes the possibilities involved in using the literary mode to present political teachings.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4751 (3) The Politics of Ideas

Examines theoretical arguments and case studies of interactions of ideas, interests, and institutions in policymaking. Analyzes processes through which ideas come to the public agenda, how institutional settings shape those ideas, and why some ideas and interests are more successful.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4771 (3) Civil Rights and Liberties in America

Implementation of rights and liberties in America. Examines fundamental issues of free speech, press, association, and religion along with rights to due process and equal protection under the law.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: American

PSCI 4783 (3) Global Issues

Studies the principal issues confronting humanity that affect stability and survivability and their economic, social, and political implications.

Requisites: Restricted to Political Science (PSCI), International Affairs (IAFS) or Environmental Studies (ENVS) majors only.

Recommended: Prerequisite PSCI 2012 or PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4792 (3) Issues in Latin American Politics

Studies several Latin American countries in some depth including history and contemporary politics. Teaches students to listen to and evaluate different sides of political controversies, and critically evaluate arguments.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 2012.

Additional Information: Departmental Category: Comparative

PSCI 4841 (1-3) Independent Study in American Politics

Subjects are chosen and arrangements are made to suit the needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. A special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: American

PSCI 4842 (1-3) Independent Study in Comparative Politics

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 2012 or IAFS 1000.

Additional Information: Departmental Category: Comparative

PSCI 4843 (1-3) Independent Study in International Relations

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 2223.

Additional Information: Departmental Category: International Relations

PSCI 4844 (1-3) Independent Study in Political Theory

Subjects and arrangements suit individual student needs. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite PSCI 2004.

Additional Information: Departmental Category: Political Theory

PSCI 4846 (1-3) Independent Study in Public Policy

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average GPA of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 4848 (1-3) Independent Study

Subjects chosen and arrangements made to suit needs of each student. Independent study is for upper-division students who have completed 9 credit hours of political science and who have an overall average of at least 3.00. Not more than 6 credit hours of independent study may be credited toward the minimum requirements in the political science major. Special independent study approval agreement form must be obtained from the department.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSCI 4938 (3-6) Internship in Government

With instructor's assistance, students secure an internship with a political or governmental organization. In addition to the internship, the class consists of regular seminars, course readings and assignments, and individual conferences with the instructor. Student pursues an academic research project and writes an original research paper.

Instructor approval required in semester preceding internship. Contact instructor prior to early registration.

Recommended: Prerequisite PSCI 1101.

Additional Information: Departmental Category: General

PSCI 6948 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSCI 7002 (3) Seminar in West European Politics

Examines West European politics in terms of general theories of comparative politics, including institutional, behavioral and political economy approaches.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7004 (3) Seminar: Political Theory

Allows for intensive research in and presentation of selected topics. Introduces students to the broad context within which political ideas arise. Deals with classical and modern thought.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Political Theory

PSCI 7008 (1) Teaching Political Science

Designed to prepare graduate student teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline-specific education.

Requisites: Restricted to Political Science (PSCI) graduate students only.

Additional Information: Departmental Category: General

PSCI 7011 (3) Seminar: American Politics

Core field seminar for students of American politics. Course work emphasizes the diversity of contemporary research on American political history, political institutions, and political behavior.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7012 (3) Seminar: Comparative Political Systems

Discusses current literature on comparative politics including theoretical and methodological issues.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7013 (3) Seminar: International Relations

Reviews salient literature on international relations, and subsequent presentation and critical discussion of analytical studies. Allows students wide latitude in substantive and methodological approaches. Emphasizes changing trends and efforts to understand the bases for cooperation and conflict.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7021 (3) Latinos and U.S. Politics

Examines in depth the theoretical and empirical literature assessing the political situation and activities of Latinos (Mexican Americans, Puerto Ricans, Cuban Americans, and others) in the U.S. Stresses original research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7022 (3) Seminar in Political and Economic Development

Covers domestic political and economic development in Latin America, Africa, and Asia, as well as interactions with the global economy. Includes defining, explaining, and prescribing policies for successful development, and comparing the experiences of developing and industrialized countries.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7023 (1) Foreign Policy

Examines sources of foreign policy in terms of international pressures, economic interests, bureaucratic politics, cognitive process, public opinion, elections, congress, and presidential leadership. Examines uses and limitations of economic statecraft, military intervention, and current foreign policy issues.

Recommended: Prerequisite PSCI 7013.

Additional Information: Departmental Category: International Relations

PSCI 7024 (3) Seminar: Selected Political Theories

Familiarizes students with selected political philosophies or theories in classical or modern political thought.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Political Theory

PSCI 7028 (1) Teaching Political Science 2

Second course designed to train graduate teachers in the essentials of political science teaching and provide a background in theories of political science teaching and practical skills development in discipline specific education.

Requisites: Requires prerequisite course of PSCI 7008 (minimum grade D-). Restricted to Political Science (PSCI) graduate students only.

Additional Information: Departmental Category: General

PSCI 7031 (3) Seminar: Political Attitudes and Behavior

Provides an intensive examination of topics in political attitudes and behavior such as political participation, ideology, voting, and elite behavior. Reviews methodology of behavioral research and introduces ICPSR data archive and computer-based research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7032 (3) Seminar: Latin American Politics

Stresses intensive study of the political process in Latin America with special emphasis on democratization.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7043 (3) Seminar: Problems of International Organization

Studies selected problems concerning administration and operation of public international organizations, including the United Nations and its specialized agencies. Considers decision making, executive leadership, internal organization, personnel policies, coordination of activities, and financing.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7046 (3) Seminar: Urban Public Policy

Focuses on formulation, revision, and outcomes of public policy in American urban communities. Also uses some comparative Canadian and European literature.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Policy

PSCI 7051 (3) Seminar: The United States Congress

Comprehensively examines literature and selected research topics concerning the United States Congress.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7052 (3) Democracy & Authoritarianism

Examine differences between democracies and authoritarian regimes; the choices and the consequences of democratic institutions in authoritarian regimes; and the causes of authoritarian survival and demise and the subsequent political choice.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PSCI 7012.

Additional Information: Departmental Category: Comparative

PSCI 7053 (3) War and Peace

Explores the conditions that promote conflict between countries, focusing on broad and systemic explanations of war and peace. Investigates classical as well as current behavioral approaches to understanding why countries fight.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7055 (3) Introductory Game Theory

Develops competence in engaging formal theories of politics and in constructing and solving basic game-theoretic models of political behavior.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7056 (3) Readings in Public Policy

Explores diverse approaches to policy choice, change, and learning processes. Overviews literature on policy determinants and typologies, policy subsystems, innovation and diffusion, agenda setting, implementation, problem definition and social construction, policy design, institutional analysis, and policy and democratic values.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Policy

PSCI 7062 (3) The Politics of Ethnicity

Explores the political aspects of pluralism, ethnonationalism, separatism, and related phenomena. Examines theories of ethnic mobilization, conflict, and accommodation in the context of political development and nation building. Includes cross-polity comparisons and case studies of multiethnic societies in the developed and developing world.

Requisites: Restricted to graduate students only.

Recommended: Requisite at least one course in comparative politics.

Additional Information: Departmental Category: Comparative

PSCI 7071 (3) Seminar: An Introduction to the Rule of Law

Introduces students to debates about the role of institutions, particularly but not exclusively legal institutions, in placing limits on the state and fostering the rule of law. What is law? Why do courts exist and what is their role in the state? What institutions are necessary to establish the rule of law? Why are institutions successful in some contexts and not others? Considers these questions by surveying classic and current research from American and comparative politics literatures on topics such as judicial independence, credible commitments, separation of powers and constitutional design.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7073 (3) Seminar: Global Political Economy

Introduces graduate students to concepts, theories, and data used to study the global system from a political-economic framework. Examines world systems analysis, regime change theory, and dependency theory with respect to operation of the exchange and power relationship within the contemporary world system.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7075 (3) Scope and Methods of Political Science

Introduces students to research design, with a subsequent focus on professional development. Students learn about different styles of research, central methodological points surrounding (and differentiating) these styles, and standards for evaluating research, regardless of approach or content.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7085 (4) Introduction to Political Science Data Analysis

Provides intensive experience with quantitative techniques commonly employed in political science research, covering basic inferential and descriptive statistics through multiple regression. Students undertake substantive research projects, requiring lab instruction in the use of the computer in quantitative applications of political science research.

Requisites: Restricted to Political Science (PSCI) graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7091 (3) Politics of Social Movements

Examines theoretical and empirical research on American social movements. Emphasizes the role of movements as political actors and their ability to bring about changes in public policy and national political institutions.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7095 (3) Advanced Political Data Analysis

Provides advanced training in the statistical modeling of political relationships. Focuses on the properties and assumptions of the ordinary least squares regression model, building on material covered in PSCI 7085: Introduction to Political Science Data Analysis.

Requisites: Requires prerequisite course of PSCI 7085 (minimum grade B-). Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7108 (3) Special Topics

Various topics not normally offered in the curriculum. Topics vary each semester.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSCI 7111 (3) Seminar: American Political Institutions

Intensive examination of the structure and rules of different political institutions in the United States. Explores both the changing approaches to the study of American political institutions as well as many of the major research topics on the presidency, Congress, the judiciary, and the bureaucracy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7112 (3) Seminar: Comparative Political Parties and Interest Groups

Critically examines topics relating to social forces, parties, and interest groups. Analyzes concepts, theories, and case studies with particular emphasis on Western political systems. Also examines party systems in comparison and the role of groups and the determinants of group politics.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7114 (3) Survey of Historical and Contemporary Political Theory

Examines major texts of Western political thought from the ancients through the 21st century. Introduces students to major schools of contemporary political theory, while situating these in their larger political context. Professionalizes students through presentations and research projects. Texts vary each semester.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Requisite some previous coursework in political theory or philosophy.

Additional Information: Departmental Category: Political Theory

PSCI 7115 (3) Qualitative Methods

Develop proficiency in constructing research designs with qualitative methods. The goal is to understand and be able to justify research designs involving relatively small numbers of observations as good political science given the fact that such designs may limit our ability to generalize.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7116 (3) Context-Sensitive Research Methods

Prepares students to conduct research on topics where data is not obvious or not easily available. Encompasses variations in context and setting as part of data observations. Methods include interviewing protocols, interpretive methods, cluster analyses, case study methodologies and textual analyses.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 5740

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Public Policy

PSCI 7123 (3) Seminar: Conflict Behavior - The Politics of Violence

Surveys historical, theoretical, and empirical analyses of violent conflict behavior, including causes and consequences of riots, terrorism, revolution, international war, and intervention.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7124 (3) Contemporary Democratic Theory

Surveys major schools of contemporary democratic theory and introduces students to current scholarly debates about democracy and democratic politics. Professionalizes students through class presentations and research projects. Specific controversies and texts vary each semester.

Requisites: Restricted to graduate students only.

Recommended: Requisite some previous coursework in political theory or philosophy.

Additional Information: Departmental Category: Political Theory

PSCI 7126 (3) Introduction to Public Policy

Designed for graduate students specializing in the field of public policy in the political science program. Surveys a wide variety of approaches to the analysis and understanding of public policy. The course is not a survey of any particular set of substantive policy areas but instead is intended as an examination of the enduring puzzles that analysts of public policy commonly confront, the kinds of research methodologies that they employ, and a selection of the techniques that they bring to bear on their research questions.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 7132 (3) Comparative Political Economy

Explores the relationship between economics and politics in developed and developing countries. Gives students an historical overview of 20th century economic trends and covers scholarly approaches to topics such as political and economic institutions, economic ideas and interests, the political causes of growth and equality, globalization and the welfare state, and varieties of capitalism.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite PSCI 7012.

Additional Information: Departmental Category: Comparative

PSCI 7145 (3) Advanced Game Theory

Covers more advanced applications of game theory in political science. Equips students with the skills to design and solve models at a reasonably high level of complexity and generality, and to understand how to effectively make use of such models in their research.

Requisites: Requires prerequisite course of PSCI 7055 (minimum grade B-). Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7151 (3) American Subnational Politics and Government

Provides a comprehensive overview of the issues and literature concerning American "subnational" politics. Considers three bodies of literature: American federalism and intergovernmental relations, state politics, and urban/local politics. Also examines a number of policy issues.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7155 (3) Maximum Likelihood Estimation and Generalized Linear Models

Introduces maximum likelihood estimation and extends the linear model to several "generalized linear models." Provides students with the skills to analyze and understand a broad class of outcome variables and data structures such as dichotomous outcomes, counts, ordered and unordered categorical outcomes and bounded variables. Also examines several special topics such as multilevel models, causal inference and missing data.

Requisites: Requires prerequisite courses of PSCI 7075 and PSCI 7085 and PSCI 7095 (all minimum grade B-). Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7171 (3) Seminar: Law and Democratic Governance

Explores cutting-edge debates in election law. Studies different perspectives on the current controversies in the field, in addition to select opportunities to engage scholars directly about their work. Develops students' understanding of the law of democracy, exposing students to some of the best scholarship, and improving students' ability to evaluate and critique legal scholarship.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 8205

Recommended: Prerequisite PSCI 7011.

Additional Information: Departmental Category: American

PSCI 7173 (3) The Politics of International Factor Flows

Focuses on the second dimension of international trade: the politics of international factor flows. Economic globalization can be defined as the freer flow of (1) goods and services (i.e., international trade) and (2) factors of production (e.g., capital and labor) across national borders. Links these topics in International Political Economy to broader theories of International Relations, namely Institutionalism and Liberalism.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Relations

PSCI 7175 (3) Dissertation Seminar

Help students make progress towards (1) in the short term: focusing in on a dissertation topic, crafting a dissertation prospectus, and identifying potential funding sources; and (2) in the long term: sending papers out for review, developing a package for the job market, and understanding the academic job market and the tenure process.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7181 (3) Immigration Law and Immigrants' Rights

Addresses four broad questions: Who is a citizen of the United States? Who else can come to this country? When and why can noncitizens be forced to leave? Who has the authority to answer these questions? These questions prompt us to examine the history of U.S. immigration, the constitutional-statutory-regulatory framework that governs immigration and citizenship law and the federal agencies that administer it. Also addresses contemporary challenges to, and assertions of, immigrants' rights.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7615

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 7183 (3) International Cooperation

Investigates the origins, forms and consequences of international cooperation. The course covers both theoretical material related to international cooperation and various related global issue areas; security, economy, environment and social welfare. For each issue area, the key theoretical debates, empirical findings, as well as central challenges and parameters that constrain international cooperation will be investigated.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: International Relations

PSCI 7185 (3) Political Network Analysis

Explores all aspects of political network analysis including disciplinary background, theories and concepts, approaches and applications, data basics and measurement, and techniques of analysis. Data assignments use software such as UCINET and R. Introduces visualization software including NetDraw, NetworkX and Cytoscape.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7191 (3) Law and Politics Colloquium: Race in America

A co-taught colloquium that exposes students to highly prominent scholars conducting research on current topics at the intersection of race, social science and the law, including racial profiling, hate crime and affirmative action. Students will complete a final paper satisfying the CU Law seminar requirement.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 8645

Grading Basis: Letter Grade

Additional Information: Departmental Category: American

PSCI 7206 (3) Public Policy and the Governance of Natural Resources

Addresses a basic empirical puzzle in comparative environmental policy: why are some governmental organizations able to create relatively functional governance arrangements for natural resources management, while many others fail to do so? More specifically, we will seek to understand the particular contextual conditions that make successful governance transformations more likely.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Public Policy

PSCI 7302 (3) Political Economy of International Migration and Policy

Provides an overview of the seminal and cutting edge research on the political economy of international migration including both immigration and emigration. Covers a diverse set of international migration issues, including public attitudes toward immigration, special interest politics of immigration policy making and the dynamics between political institutions and international migration.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: International Relations

PSCI 7901 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: American

PSCI 7902 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Comparative

PSCI 7903 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: International Relations

PSCI 7904 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Political Theory

PSCI 7905 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 7906 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Public Policy

PSCI 7908 (1-3) Independent Study

Not a free option; must be approved by the student's advisor and program chair. Does not count as seminar. Not more than 6 hours of independent study may be credited toward PhD degree in political science. Special independent study approval agreement form must be completed by student and signed by faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSCI 8901 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: American

PSCI 8902 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Comparative

PSCI 8903 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: International Relations

PSCI 8904 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Political Theory

PSCI 8905 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 8906 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Public Policy

PSCI 8908 (1-3) Graduate Research Topic

Provides an opportunity for independent research in a topic of special interest. Arrangements are made to suit the needs of each particular student. Not a free option; must be approved by student's advisor and department chair. Does not count as a seminar.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSCI 8991 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: American

PSCI 8992 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Comparative

PSCI 8993 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: International Relations

PSCI 8994 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Political Theory

PSCI 8995 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Empirical Theory and Research Methodology

PSCI 8996 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 99.00 total credit hours.

Additional Information: Departmental Category: Public Policy

Portuguese (PORT)

Courses

PORT 1010 (5) Beginning Portuguese 1

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Portuguese

PORT 1020 (5) Beginning Portuguese 2

Provides students with basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Introduces the cultures of the Portuguese speaking world, with a focus on Brazil. Continuation of PORT 1010. Department enforced prerequisite: PORT 1010 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Portuguese

PORT 2110 (3) Second-Year Portuguese 1

Involves practice in speaking, listening comprehension, reading and writing at an intermediate level. Explores relevant topics of the Brazilian culture through different media. Besides introducing grammar topics corresponding to the intermediate level of the Portuguese languages, it includes grammar review (PORT 1010 and PORT 1020) and extra work on vocabulary acquisition. Department enforced prerequisite: PORT 1020 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language
Departmental Category: Portuguese

PORT 2120 (3) Second-Year Portuguese 2

Includes practice in speaking, listening comprehension, reading and writing at intermediate level, based on the Communicative Approach. Includes grammar and extra work on vocabulary acquisition, both explored through literary texts by renowned authors of the Portuguese speaking world, with a focus on Brazilian literature.

Additional Information: Departmental Category: Portuguese

PORT 2350 (3) Portuguese for Romance Language Speakers

Focusing on Brazilian Portuguese, this course constitutes an intensive introduction to Portuguese language for those who speak a Romance language. Comprehends basic vocabulary and fundamentals of grammar through practice in speaking, listening comprehension, reading and writing, based on the Communicative Approach. Uses different media to explore cultural aspects of the Portuguese speaking world.

Recommended: Requisite three semesters of college equivalent in any Romance language.

Additional Information: Departmental Category: Portuguese

PORT 2800 (3) Brazil: Past and Present

Discusses contemporary Brazil through the lenses of its literary, as well as socio-political movements. Students acquire a broader perspective of the country's current dynamics based on the formation of its national identity from 1500 to today. History serves as background to analyze literature and arts and critically understand Brazilian culture. Taught in English. Does not count toward Portuguese minor or Spanish and Portuguese major.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Portuguese

PORT 3003 (3) Advanced Portuguese Language Skills

Consists of an advanced language course focused on current socio-environmental issues in Brazil. Involves reading academic texts of different areas of study, writing essays, watching documentaries, conducting class presentations and discussions and studying grammar and vocabulary in the context of a more sophisticated written Portuguese.

Requisites: Requires prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 3220 (3) Latin American Culture: Spanish America and Brazil

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present. Taught in Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 3220

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Recommended: Prerequisites PORT 2110 and PORT 2120.

Additional Information: Departmental Category: Portuguese

PORT 3230 (3) Transatlantic Relations in the Portuguese Speaking World

Examines cultural movements in Brazil, Portugal and Portuguese-speaking Africa, from the 15th century period of Portuguese expansion to the postcolonial present. Includes articles on culture as seen through literary, artistic, historical and sociological lenses. Taught in Portuguese.

Requisites: Requires prerequisite courses of PORT 2110 and PORT 2120 and PORT 2350 (all minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 3270 (3) Socio-Environmental Dynamics in Brazil

Gives students the opportunity to immerse themselves in the language, culture and contemporary realities of rural Maranhao, Brazil. Explores some of the most pressing issues in Brazil today with focus on sustainable development, environmental governance and social entrepreneurship.

Requisites: Requires a prerequisite course of PORT 2110 or PORT 2350 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Portuguese

PORT 4110 (3) Brazilian Literature

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays includes.

Equivalent - Duplicate Degree Credit Not Granted: PORT 5110

Requisites: Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 4150 (3) Literature of the Portuguese Speaking World

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

Equivalent - Duplicate Degree Credit Not Granted: PORT 5150

Requisites: Requires a prerequisite course of PORT 2120 or PORT 2350 (minimum grade C-).

Additional Information: Departmental Category: Portuguese

PORT 4230 (3) Special Topics in Luso-Brazilian and/or African Literature

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese colonization. Taught in Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 4230

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Portuguese

PORT 4840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Portuguese

PORT 5110 (3) Brazilian Literature

Focuses on Brazilian literature through the lenses of literary and cultural studies. May address fiction, poetry or the relationship between literature and film. Besides reading literary texts, reading of academic essays is included.

Equivalent - Duplicate Degree Credit Not Granted: PORT 4110

Additional Information: Departmental Category: Portuguese

PORT 5150 (3) Literature of the Portuguese Speaking World

Examines major works of Portuguese literature and/or Portuguese speaking African literature through the lenses of cultural and literary studies. May address fiction, poetry, or the relationship between literature and cinema.

Equivalent - Duplicate Degree Credit Not Granted: PORT 4150

Additional Information: Departmental Category: Portuguese

Presidents Leadership Class (PRLC)

Courses

PRLC 1810 (3) Ethical Leadership

Introduces fundamental principles of leadership and ethics. Emphasizes application of the principles for self-development and organizational effectiveness.

Requisites: Restricted to students in the Presidents Leadership Class (PPLC) only.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

PRLC 1820 (3) Community Issues in Leadership

Explores challenges to leadership at the community level such as drug abuse, poverty, decline of infrastructure, care of the aged, etc. Gives particular attention to the development of effective leadership responses to community difficulties at university, city, state, and national levels.

Requisites: Restricted to students in the Presidents Leadership Class (PPLC) only.

Grading Basis: Letter Grade

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

PRLC 2820 (3) Multilevel Issues in Leadership

Studies multilevel issues that originate in organizational settings but carry community and global implications. Encourages students to fully explore the complexity and interrelatedness of issues with a special emphasis on leadership and ethical implications.

PRLC 2930 (1-3) Leadership Internship

Students analyze the leadership styles within a host organization, examine how successfully an organization fulfills its mission and further refine their own theories of what constitutes effective leadership. Students also complete a meaningful project over the course of the internship. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

PRLC 3800 (3) Global Inquiry for 21st Century Leadership

Introduces students to the ways in which leadership and sustainable development theory converge, challenges students to examine these issues in specific contexts around the world, and provides them with practical training in cross-cultural competency and leadership skills.

Recommended: Prerequisite PRLC 1810 or PRLC 1820 or PRLC 2820.

Grading Basis: Letter Grade

PRLC 3810 (3) Global Issues in Leadership

Examines the challenges to leadership posed by major global issues. Problems in the areas of human rights, hunger, disease, large-scale collective violence and environmental deterioration are explored with a special emphasis on the development of effective, long-term leadership strategies. Department enforced prerequisites: PRLC 1810 and PRLC 1820 and PRLC 2820.

PRLC 4010 (3-4) 21st Century Leadership

An advanced course that focuses on critical analysis of leadership principles and techniques. Designed to provide theoretical and hands-on experience for individuals who wish to function in leadership roles at high levels of competence in the workplace and in the civic arena.

Requisites: Requires prerequisite courses of PRLC 1810 and PRLC 1820 (all minimum grade D-). Restricted to students in the Presidents Leadership Class (PPLC) only.

PRLC 4081 (3) Icons of the American Republic

Examines the founding period of the United States through the events, political concepts and individuals depicted in the art exhibited in the U.S. Capitol Building in Washington, D.C. The course includes a visit to the U.S. Capitol Building, the floor of the U.S. House of Representatives, the floor of the U.S. Senate, and an exploration of the legislative process.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite PSCI 1101 or PSCI 2012 or PSCI 2223 or PSCI 2004.

Additional Information: Departmental Category: American

Psychology (PSYC)

Courses

PSYC 1001 (3) General Psychology

Surveys major topics in psychology: perceptions, development, personality, learning and memory, and biological bases of behavior. Students may participate as subjects for several hours in ongoing research.

Additional Information: Departmental Category: General
MAPS Course: Social Science

PSYC 2012 (3) Biological Psychology

Surveys biological bases of learning, motivation, emotion, sensory processes and perception, movement, comparative animal behavior, sexual and reproductive activity, instinctual behavior, neurobiology of language and thought, and neurophysiology and neuroanatomy in relation to behavior.

Recommended: Prerequisite PSYC 1001.

Additional Information: GT Pathways: GT-SC2 -Natural Physicl Sci: Lec Crse w/o Req Lab

Arts Sci Core Curr: Natural Science Non-Sequence

Departmental Category: Biological

PSYC 2111 (4) Psychological Science I: Statistics

Three hours of lecture and one two-hour lab per week. Introduces descriptive and inferential statistics and their roles in psychological research. Topics include correlation, regression, T-test, analysis of variance and selected nonparametric statistics.

Requisites: Requires prerequisite course of MATH 1011 or MATH 1071 or MATH 1081 or MATH 1150 or MATH 1212 or MATH 1300 (minimum grade C-).

Additional Information: Departmental Category: General

PSYC 2145 (3) Introductory Cognitive Psychology

Introduces the study of human cognitive processes and covers perception, attention, memory, language, problem solving, reasoning, and decision making. Focuses on basic research and theory in cognitive psychology but also considers their implications for everyday applications such as effective learning and retention, multitasking, and eyewitness testimony.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 2606 (3) Social Psychology

Covers general psychological principles underlying social behavior. Analyzes major social psychological theories, methods, and topics, including attitudes, conformity, aggression, attraction, social perception, helping behavior, and group relations.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Social

PSYC 2643 (3) Child and Adolescent Psychology

Surveys major psychological processes of childhood and adolescence.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: Departmental Category: Clinical

PSYC 2700 (3) Psychology of Gender and Sexuality

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2700

Requisites: Requires a prerequisite course of PSYC 1001 or WGST 2000 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: General

PSYC 3001 (4) Honors Research Methods Seminar

Focuses on research design. Each student prepares an original, detailed research proposal, which can become the honors thesis. Open only to students who have been accepted into the psychology departmental honors program. Instructor consent required.

Additional Information: Arts Sciences Honors Course
Departmental Category: General

PSYC 3005 (3) Cognitive Science

Provides an introductory survey of influential models, theoretical approaches, and methods of cognitive science. Emphasizes and explains the convergence by work in multiple fields - including psychology and neuroscience, linguistics, computer science, and philosophy - on the idea that mental activity is a form of computation. Students from diverse backgrounds are introduced to a wide range of methods and approaches, including behavioral and neuroimaging experimental approaches, computational modeling and philosophical work. Department enforced prerequisites: two of the following CSCI 1300 or LING 2000 or PSYC 2145.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and LING 3005 and PHIL 3310 and SLHS 3003

Additional Information: Departmental Category: Experimental

PSYC 3102 (3) Behavioral Genetics

Introduces the basic principles of genetics, covers how these principles can be used in the study of behavior, and evaluates the evidence for genetic influences on behavioral characteristics.

Additional Information: Departmental Category: Biological

PSYC 3105 (3) Experimental Methods in Psychology

Provides an introduction to the use of experimental procedures in psychology. Students learn about the logic and design of experiments, the meaning of psychological data, how to analyze and interpret data, and the role of theory in psychology.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 (minimum grade C-).

Recommended: Prerequisite PSYC 2145.

Additional Information: Departmental Category: Experimental

PSYC 3111 (4) Psychological Science 2: Research Methods in Psychology

Provides a foundation in research methodology to give students the ability to design, conduct, analyze, and present (both verbally and in writing) an empirical study in psychology. Allows students to be effective producers and consumers of research.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

PSYC 3112 (3) Behavioral Genetics II

Follows PSYC 3102, Behavior Genetics, and surveys recent developments in behavior genetics, including recent genotyping and sequencing technologies, statistical approaches, and epigenetics.

Requisites: Requires a prerequisite course of PSYC 3102 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Biological

PSYC 3131 (3) Human Emotion

Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of anger, love and disgust; emotion and morality; cultural and gender differences; emotion and the brain; relation between emotion and thinking; development of emotion; and abnormal emotions in mental illness.

Recommended: Prerequisite PSYC 1001.

Additional Information: Departmental Category: General

PSYC 3303 (3) Abnormal Psychology

Examines etiological, theoretical, clinical, diagnostic, and experimental perspectives of major mental health disorders, with an emphasis on the main symptoms and diagnostic criteria associated with these disorders.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-).

Additional Information: Departmental Category: Clinical

PSYC 3456 (3) Psychology of Personality

Offers a psychological study of structure, organization and development of the person as a whole. Analysis of major theories, methods and research, including topics such as emotion, motivation, temperament, inner experience, identity and the self, personality change and the influence of sociocultural context.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Social

PSYC 3511 (3) History of Psychology

Includes outline of development of psychological theories since the Greek philosophers, the story of experimental psychology and its problems, and schools of psychological thinking. Students read original sources in English and English translations. Formerly PSYC 4511.

Requisites: Requires a prerequisite course of PSYC 1001 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General

PSYC 3684 (3) Developmental Psychology

In-depth consideration of human developmental processes across the life span. Includes coverage of the major topics in human development, such as physical, cognitive, social, emotional, and moral development.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisites PSYC 1001 and PSYC 2111 and PSYC 3111.

Additional Information: Departmental Category: Developmental

PSYC 4001 (3) Honors Seminar 2

Surveys contemporary issues, explores current controversies, and examines in detail selected topics in psychology. Open to juniors and seniors pursuing departmental honors.

Additional Information: Arts Sciences Honors Course

Departmental Category: General

PSYC 4011 (1-3) Senior Thesis

Critically reviews some aspect of psychological literature, scholarly analysis of a major psychological issue, and/or empirical research project. See the psychology honors director for further information.

Additional Information: Departmental Category: General

PSYC 4021 (3) Psychology and Neuroscience of Exercise

Explores social, cognitive, psychobiological and behavioral aspects of exercise and other forms of physical activity. Examines how psychological and neuroscience research have been used to study how participation in regular physical activity affects mental health and how psychological and other variables influence participation in, adherence to, enjoyment of, and consequences of exercise and physical activity.

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General

PSYC 4052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5052 and NRSC 4052 and NRSC 5052

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following sequences EBIO 1210 and EBIO 1220 or CHEM 1113 and CHEM 1133 or PHYS 1010 and 1020 or PHYS 2010 and PHYS 2020 (all minimum grade C-).

Additional Information: Departmental Category: Biological

PSYC 4114 (3) Educational Psychology and Adolescent Development

Examines the principles of educational and adolescent psychology and development that play a significant role in analyzing and understanding the complex processes in middle and secondary school classrooms. Course has both theoretical and practical dimensions.

Equivalent - Duplicate Degree Credit Not Granted: EDUC 4112

Additional Information: Departmental Category: Developmental

PSYC 4136 (4) Judgment and Decision Making

Introduces the study of judgment and decision making processes (estimation, prediction and diagnosis, choice under certainty, and risky decision making) and the methods that have been developed to improve these processes (statistical modeling, decision analysis, and expert systems).

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Social

PSYC 4142 (3) Brain Injury, Plasticity and Recovery: From Neuron to Behavior

Traumatic brain injury is prevalent in all aspects of society, with incidence rates varying according to age, gender, military affiliation and participation in certain sports. Delves into the full spectrum of consequences following injury, beginning with the individual neural cells in the brain through to the behaving individual. Covers strategies to improve functional recovery.

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) majors only.

Recommended: Prerequisite NRSC 4132.

Additional Information: Departmental Category: Biological

PSYC 4145 (4) Advanced Cognitive Psychology

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5145

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2145 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4155 (4) Cognitive Neuroscience/Neuropsychology

Introduction to cognitive neuroscience and neuropsychology. Provides a survey of the neuropsychological underpinnings for a wide range of cognitive functions: vision, object recognition, attention, language, memory and executive function. One lab per week.

Equivalent - Duplicate Degree Credit Not Granted: NRSC 4155

Requisites: Requires a prerequisite course of PSYC 2012 or NRSC 2100 and one of the following: PSYC 2111 or MATH 2510 or IPHY 2800 or EBIO 1010 or BCOR 1020 or ECON 3818 (all minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4165 (4) Psychology of Perception

One lab, three lect. per week. Analyzes peripheral and central mechanisms involved in the transduction and interpretation of experience. Gives special attention to vision and audition; major theories in these areas are discussed in terms of research they have inspired.

Requisites: Requires a prerequisite course of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4175 (4) Computational Cognitive Neuroscience

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5175

Requisites: Requires prereq of PSYC 1001 and PSYC 2012 or NRSC 2100 and PSYC 2111 or MATH 2510 or 2520 or IPHY 2800 or APPM 1710 or 2750 or CHEN 3010 or 3130 or ECON 3818 (min grad C-). Restricted to PSYC or NRSC majors with 57-180 credits only.

Additional Information: Departmental Category: Experimental

PSYC 4220 (3) Language and Mind

Studies topics such as speech perception, word recognition, sentence comprehension, language acquisition, bilingualism, reading and writing. Examines the role of language as a product and producer of the mind, studying interactions between language and cognition from an interdisciplinary perspective. Students will become familiar with the methods of psycholinguistics and design and conduct a psycholinguistic experiment on their own.

Equivalent - Duplicate Degree Credit Not Granted: LING 4220

Recommended: Prerequisites PSYC 1001 and LING 2000.

Additional Information: Departmental Category: General

PSYC 4225 (4) Interdisciplinary Research Methods in Child Language Acquisition

Explores fundamental issues in language acquisition cross-culturally, combining methods from Linguistics, Anthropology, Psychology and Computer Science. Students will explore theoretical issue using a hands-on approach that involves acquiring skills such as designing and conducting experiments, investigating corpus data, and computational modeling.

Equivalent - Duplicate Degree Credit Not Granted: LING 4225

Requisites: Requires a prerequisite course of PSYC 1001 or LING 2000 (minimum grade C).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Developmental

PSYC 4263 (3) Evidence-Based Practice in Mental Health: Science and Skills

Provides an intensive introduction to behavioral interventions for common mental health problems and the framework of evidence-based practice in psychology, including helping students to acquire, critically evaluate and communicate about clinical psychological science intervention research and become familiar with applied skills that are relevant to a broad range of clinical settings.

Requisites: Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-)

Grading Basis: Letter Grade

PSYC 4332 (1) Found in Translation: TBI From Bench to Bedside to Community

Traumatic Brain Injury (TBI) is prevalent in all aspects of society. Delves into all aspects of TBI, with particular emphasis on translational clinical neuroscience. That is, the movement of knowledge from bench, to bedside, to community. All of this knowledge resulting in better treatment of and outcome for those with TBI.

Requisites: Requires prerequisite courses of PSYC 2012 or NRSC 2100 (minimum grade C-). Restricted to students with 57-180 units (Juniors or Seniors).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Biological

PSYC 4376 (4) Research Methods in Social Psychology

Introduces the study of social psychological processes, emphasizing the social cognition perspective (e.g., stereotyping, person perception, theory of planned behavior) and the methods utilized in studying these processes. Students will complete research projects as part of the course.

Requisites: Requires prerequisite courses of PSYC 2606 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Social

PSYC 4385 (3) Ethology and Comparative Psychology

Discusses behavior of representative members of each animal phylum. Emphasizes ontogeny of behavior as well as phylogeny.

Requisites: Requires a prerequisite course of PSYC 1001 or EBIO 1210 (minimum grade C-).

Additional Information: Departmental Category: Experimental

PSYC 4443 (4) Research Methods in Clinical Psychology

Learn to evaluate research methods as they relate to etiology, assessment, and intervention of psychological disorders. Emphasizes the importance of using sound methodological strategies in both research and clinical settings.

Requisites: Requires prerequisite courses of PSYC 2111 and PSYC 3111 and PSYC 3303 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) only.

Additional Information: Departmental Category: Clinical

PSYC 4521 (3) Critical Thinking in Psychology

Allows students to expand their powers as they think about psychological problems, or about how psychological knowledge and techniques can be applied to pressing political, economic, biological, quantitative and social issues. Encourages intellectual discipline and critical thinking about concepts and ideas; enables students to participate in oral and written discussion. May not be repeated, only 3 credit hours allowed.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Psychology (PSCY) majors only.

Additional Information: Departmental Category: General

PSYC 4526 (3) Social Neuroscience

Develops greater knowledge of the general psychological principles underlying social behavior by using methods and theories from neuroscience. Students learn about common methods in human neuroscience and how they can be applied to better understand social behavior.

Requisites: Requires prerequisite courses of PSYC 2012 and PSYC 2111 and PSYC 2606 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (junior or senior) Psychology (PSYC) or Neuroscience (NRSC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Social

PSYC 4541 (3) Special Topics in Psychology

Studies and analyzes special interest topics from the broad and diversified field of psychology. Particular section content is determined by instructor.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 5541

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: General

PSYC 4543 (3) Clinical Neuropsychological Disorders

Neuropsychological disorders are behavioral and cognitive expressions of underlying brain diseases or injury. The course will provide in-depth coverage from clinical perspectives of wide range of disorders caused by stroke, traumatic brain injury, degenerative diseases, and inflammatory diseases. Students will learn the various neurologic, neuroimaging and neuropsychological methods for assessing and diagnosing these disorders and will review specific illustrative cases.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Clinical

PSYC 4553 (3) Women's Mental Health: A Biopsychosocial Approach

Provides a broad overview of current research and theory related to women's mental health, emphasizing topics and problems that are prevalent among or particularly relevant to women. Teaches students to develop a critical and integrative understanding women's mental health, including historical, social, cultural, biological, behavioral, cognitive and emotional factors.

Requisites: Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Clinical

PSYC 4560 (3) Language Development

Examines the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

Equivalent - Duplicate Degree Credit Not Granted: LING 4560 and SLHS 4560

Requisites: Restricted to Psychology (PSYC) or Neuroscience (NRSC) majors only.

Recommended: Prerequisites PSYC 1001 and LING 2000.

Additional Information: Departmental Category: General

PSYC 4606 (3) Advanced Topics in Social Psychology

In-depth study of selected topics in social psychology. Particular section content each semester is determined by the instructor. May be repeated for a maximum of 6 credit hours, provided the topics vary.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2606 and PSYC 2111 and PSYC 3111 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Social

PSYC 4713 (3) Survey of Clinical Psychology

Covers theories and practices relating to problems of ability and maladjustment. Diagnostic procedures and treatment methods with children and adults.

Requisites: Requires a prerequisite course of PSYC 3303 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Additional Information: Departmental Category: Clinical

PSYC 4733 (4) Psychological Testing and Assessment

Provides an overview of issues central to testing and assessment of psychological constructs, including types of evaluation instruments currently in use in the field, their applications and design.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and 3111 (all minimum grade C-).

Additional Information: Departmental Category: Clinical

PSYC 4744 (4) Methods in Developmental Psychology

Learn to critically read and form hypotheses from studies in the developmental literature, gain hands-on experience in testing children and in the design of methods to test children, evaluate experimental data and relate them to hypotheses, previous results and theory, and write so others can understand.

Requisites: Requires prerequisite courses of PSYC 1001 and PSYC 2111 and PSYC 3111 and PSYC 3684 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General

PSYC 4841 (1-6) Independent Study (Upper Division)

Pass/fail only.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Psychology (PSYC) majors only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSYC 4911 (3) Teaching of Psychology

Students receive concrete experience in teaching general psychology under supervision of a psychology faculty member. Alternative pedagogical strategies are discussed. Students must submit an application to the undergraduate advising center.

Additional Information: Departmental Category: General

PSYC 4931 (3) Field Placement Internship

Offers valuable volunteer experience through a supervised field placement. Provides hands-on insight into the decisions and issues that confront professionals in psychology and related fields.

Requisites: Restricted to Psychology (PSYC) majors only.

Recommended: Prerequisite completion of 15 or more hours of psychology course work.

Additional Information: Departmental Category: General

PSYC 5052 (4) Behavioral Neuroscience

This advanced course the anatomy and physiology of the central nervous system in detail, and applies that understanding to the visual, auditory, and sensorimotor systems, demonstrating how the anatomy and physiology of the nervous system can be used to explain behavior. The laboratory uses live animals and computer simulations.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4052 and NRSC 4052 and NRSC 5052

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 5082 (2-3) Seminar: Biological Psychology

Special topics concerning biological bases of behavior. Instructor consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires a prerequisite course of PSYC 4052 (minimum grade D-).

Additional Information: Departmental Category: Biological

PSYC 5102 (3) Intro to Behavioral Genetics

Provides introduction to basic principles of genetics in the study of behavior, methods used to examine the influences of genes and environment on behavior, and interpretation of studies using these methods. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 5112 (3) Concepts in Behavioral Genetics

Examines selected topics in greater detail than is possible in the comprehensive undergraduate course in behavioral genetics (PSYC 3102). Topics covered may include inheritance of behavioral characteristics from perspectives of pharmacogenetics, transmission genetics, biochemical genetics, and evolutionary genetics. Instructor consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Biological

PSYC 5122 (3) Quantitative Genetics

Surveys principles of genetics of quantitative characteristics. Topics include gene frequencies, effects of mutation, migration, and selection. Also looks at correlations among relatives, heritability, inbreeding, crossbreeding, and selective breeding.

Additional Information: Departmental Category: Biological

PSYC 5131 (3) Affective Science

Core graduate course on affective science and fulfills APA Cognitive and Affective Aspects of Behavior Requirement. Introduces students to a diverse array of theoretical and empirical issues related to the study of human emotion. Evolutionary theories of emotions; cognitive and behavioral aspects of emotion; neurobiological mechanisms; development of emotion; and psychopathology and emotion.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: General

PSYC 5145 (4) Advanced Cognitive Psychology

Advanced course in human cognitive processes. Covers key aspects of cognition, such as perception, attention, learning, memory, language and thinking. Discusses major theories and ideas in terms of the research they have inspired. Emphasis varies with instructor. One lab per week and a research project is required. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4145

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 5175 (4) Computational Cognitive Neuroscience

Introduction to cognitive neuroscience (how the brain gives rise to thought) using computer simulations based on the neural networks of the brain. Covers a full range of cognitive phenomena including perception and attention, learning and memory, language, and higher-level cognition based on both large-scale cortical neuroanatomy and detailed properties of cortical neural networks. One lab per week. Instructor consent required.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4175

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 5200 (3) Physiological Genetics and Genomics

Covers fundamental concepts in molecular genetics/genomics with physiological applications. Topics include structure and function of nucleic acids, genome structure, genetic and genomic research tools, methods for identifying disease-causing mutations, regulation of gene expression, pharmacogenetics, gene therapy and ethical issues in modern genomics. First course of a 3-course series recommended for IBG students. Includes a recitation section.

Equivalent - Duplicate Degree Credit Not Granted: IPHY 4200 and IPHY 5200

Requisites: Restricted to Integrative Physiology (IPHY or C-IPHY) or Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: General

PSYC 5232 (2) Molecular Genetics and Physiology

Covers fundamental mechanisms of gene action, including genome structure and regulation of gene expression. Discusses molecular techniques used to examine human genetic diseases. Emphasizes genetic diseases with behavioral, neurologic, and physiologic abnormalities.

Requisites: Requires a prerequisite course of PSYC 5200 or IPHY 5200 (minimum grade D-).

Additional Information: Departmental Category: Biological

PSYC 5242 (3) Biometrical Methods in Behavioral Genetics

Studies development of structural models appropriate to behavioral genetics and the estimation procedures necessary for their application. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 5423 (3) Research Problems in Clinical Psychology

Provides an overview of fundamental research methods relevant to clinical psychology, including literature synthesis, hypothesis formulation and study design, measure selection, and data analysis. Students will gain specific experience writing scientific papers and funding proposals. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 5433 (3) Adult Psychopathology

Intensively surveys major theories, research findings, and behavioral characteristics associated with deviant reaction patterns. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 5453 (3) Developmental Psychopathology

Examines the development of psychopathology across the lifespan, including etiological influences, neurobiological correlates, symptom presentation, and clinical diagnosis and intervention. Instructor consent required.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 5541 (1-6) Special Topics in Psychology

Studies and analyzes special interest topics from the broad and diversified field of psychology. Particular section content is determined by instructor.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 4541

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 5606 (3) Proseminar: Social-Personality Psychology

Provides a thorough introduction to methods and theories in social psychology concerned with topics such as the self, social cognition, judgment and decision making, attitude formation and change, small group processes, inter-group relations, health and social psychology, and others. Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Social

PSYC 5656 (3) Advanced Graduate Research Methods

Provides training in the philosophical roots of empirical research, inference of causality, internal and external validity and reliability. These topics will be covered as they relate to a range of research designs including passive observational, experimental, quasi-experimental, meta-analytic and longitudinal. Additional topics include statistical inference and research ethics.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Social

PSYC 5665 (2) Perception and Attention Proseminar

Required proseminar for students in the Cognitive Psychology Ph.D. program. Provides an introduction to current thinking about sensory and perceptual processing, object recognition and attention. Students will read peer-reviewed journal articles and make class presentations on appropriate topics, including methods of data collection and analysis. Graduate students in all programs are welcome and advanced undergraduates are welcome with instructor consent.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Experimental

PSYC 5685 (2) Research Methods Proseminar

Main topic is research methods in cognitive psychology, with an emphasis on experimental methods. Skills and knowledge will be gained that are necessary to A) critically evaluate existing research and B) design, conduct, analyze and write up experimental studies. Required for graduate students in Cognitive Psychology; graduate students in all programs and advanced undergraduates welcome with instructor consent.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Experimental

PSYC 5695 (2) Memory Proseminar

Provides beginning Ph.D. students with a basic introduction to (primarily human) memory research. One of the six required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of experimental, theoretical, behavioral and cognitive neuroscience perspectives on memory. Graduate students in all programs are welcome and advanced undergraduates are welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 5741 (4) General Statistics

Surveys probability and statistics in psychology. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 5751 (4) General Statistics

Continuation of PSYC 5741. Instructor consent required.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 5761 (3) Structural Equation Modeling

Provides training in the use of structural equation modeling, a class of analytic techniques that include the estimation of unobserved, or latent, constructs and an estimation of relationships among latent constructs.

Recommended: Prerequisite successful completion of graduate level statistics.

Additional Information: Departmental Category: General

PSYC 5815 (2) Language Proseminar

Introduction to research on human language. A required proseminar for Cognitive Psychology Ph.D. students. Covers research at the cognitive, neural, and computational levels. Addresses phenomena at the levels of phonology, grammar, and meaning. Emphasizes interrelationships between language and other domains of cognition (perception, memory, executive function). Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Experimental

PSYC 5825 (2) Executive Function Proseminar

Provides beginning Ph.D. students with an introduction to the study of executive functions. Required proseminar for students in the Cognitive Psychology Ph.D. program. Includes consideration of working memory, inhibition, multi-tasking, monitoring, selection, lifespan changes and social/clinical applications at the cognitive, neural and computational levels. Graduate students in all programs are welcome and advanced undergraduates are welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 5835 (2) Thinking Proseminar

Provides beginning Ph.D. students with a basic introduction to research on complex human cognition, including reasoning, problem solving, decision making, analogy, concept learning and knowledge representation. Includes consideration of theoretical, behavioral and cognitive neuroscience perspectives. One of six proseminar modules required of students in the Cognitive Psychology Ph.D. program. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 6200 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in computer science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and SLHS 6402

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 6603 (1) Professional Issues in Clinical Psychology

Covers a range of topics important for professional development in clinical psychology, including preparation and delivery of research presentations, preparation of grant proposals/manuscripts and practicum experience (i.e., interviewing and assessment, treatment planning, intervention and documentation). Intended to prepare students for careers as research scientists and clinicians. Instructor consent required.

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 6605 (1) Cognitive Psychology Research Update

Provides summaries of current research by graduate students and faculty members in the Cognitive Psychology program in the Department of Psychology and Neuroscience. Professional Development issues relevant to cognitive psychologists will also be discussed. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Psychology (PSYC) and Neuroscience (NRSC) PhD Students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Experimental

PSYC 6606 (1) Professional Issues in Social Psychology

Covers a range of topics important for professional development in social psychology, including preparation and delivery of research presentations, preparation of grant proposals and manuscripts, and peer review of manuscripts. Intended to prepare students for careers as research scientists.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Social

PSYC 6761 (3) Topics in Advanced Structural Equations Modeling

Covers topics in advanced structural equation modeling, including modeling with nonlinear observed variables, latent variable interactions, longitudinal models, mixture models and transition analysis. Other topics will be covered by request.

Recommended: Prerequisite PSYC 5761.

Additional Information: Departmental Category: General

PSYC 6831 (2) Interdisciplinary Social Science Professional Socialization

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 6851

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSYC 6841 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General

PSYC 6911 (1-3) Research Practicum

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: General

PSYC 6941 (1) Master's Degree Candidate

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General

PSYC 6951 (1-6) Master's Thesis

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General

PSYC 7012 (1-3) Research in Behavioral Genetics

Individual research projects.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 7102 (2) Seminar: Behavioral Genetics

Intensive study of selected topics in behavioral genetics. Emphasizes recent research. Attention to both human and animal studies. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Biological

PSYC 7215 (3) Seminar: Experimental Psychology

Advanced seminar dealing with different specialized topics, at the discretion of the instructor, in different years. Topics chosen are within the broad range of experimental psychology. Instructor consent required.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 7291 (3) Multivariate Analysis

Familiarizes students with scientific concepts, matrix theory, and computer techniques of multivariate analyses for psychological research. Topics include cluster and factor analysis, multiple regression, and discriminant functions. Emphasizes research technology rather than mathematical theory. Instructor consent required.

Additional Information: Departmental Category: General

PSYC 7315 (2) Advanced Research Seminar on Human Memory

Addresses topics in the experimental psychology of human memory. Specific content varies from semester to semester. Both theoretical issues and contemporary empirical work will be reviewed. Each student will be required to engage in laboratory work outside of class, which will include an original experiment. Graduate students in all programs and advanced undergraduates welcome with instructor consent.

Additional Information: Departmental Category: Experimental

PSYC 7415 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and SLHS 7418

Requisites: Requires a prerequisite course of CSCI 6402 or EDUC 6504 or LING 6200 or PHIL 6310 or PSYC 6200 (minimum grade B). Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

Additional Information: Departmental Category: Experimental

PSYC 7425 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and SLHS 7428

Requisites: Requires a prerequisite course of LING 7415 or PSYC 7415 or CSCI 7412 or EDUC 6506 (minimum grade B). Restricted to graduate students only.

Additional Information: Departmental Category: Experimental

PSYC 7536 (1-3) Personality and Social Psychology

Selected topics in the area of social-personality psychology. Students may register for more than one section of this course within the term and/or within their graduate career. These seminars may be on one of the following topics: stereotyping and prejudice, social neuroscience, person perception, social psychology and the self, health and social psychology, race and ethnic identity, or social cognition.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Social

PSYC 7663 (1) Intellectual Assessment Laboratory

Practice administration of common intellectual and neuropsychological tests.

Requisites: Requires corequisite courses of PSYC 7683. Restricted to graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7673 (3) Adult Psychotherapy

Provides an intensive introduction to the science and practice of psychological treatments for adult psychopathology. Will focus on selected treatments and address the relevant theoretical and empirical base for each approach and the specific principles and procedures utilized. Aim of course is for students to acquire both a scientific and applied knowledge of evidence-based practice in clinical psychology, with a focus on intervention for adult mental disorders. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 7683 (1-3) Intellectual Assessment, with Practicum, in Clinical Psychology

Focuses on administering and interpreting objective test commonly used in clinical psychology practice. Includes case study approach and direct clinical experience. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7693 (3) Personality Measurement

Covers theory and basic applications of psychological assessment, with an emphasis on measurement theory and the assessment of psychopathology and personality. Instructor consent required.

Additional Information: Departmental Category: Clinical

PSYC 7703 (1-3) Seminar: Clinical Psychology

Selected topics in the area of clinical psychology. Instructor consent required.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Psychology (PSYC) graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7713 (1-3) Practicum in Clinical Psychology

Provides direct clinical experience for clinical graduate students only. Instructor consent required.

Repeatable: Repeatable for up to 18.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Clinical

PSYC 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the LCS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science. Restricted to students enrolled in LCS Cognitive Science Academic Programs.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and SLHS 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Experimental

PSYC 7793 (1-3) Child Assessment Practicum

Allows students who have already learned adult assessment measures to broaden their knowledge and skills in order to complete psychoeducational evaluations with children. The course covers the background of common childhood disorders, general testing strategies with children, and specific test administration.

Repeatable: Repeatable for up to 3.00 total credit hours.

Recommended: Prerequisite PSYC 7683.

Additional Information: Departmental Category: Developmental

PSYC 8991 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: General

Real Estate (REAL)

Courses

REAL 2010 (3) Introduction to Real Estate

Surveys various real estate topic including acquiring and financing your home, real estate investments, managing real estate assets, development and construction and real estate sustainability. Covers techniques for estimating market values and presents metrics for evaluating real estate investment performance. Suited for anyone interested in buying, investing, managing or developing real estate. Counts as a business elective for Business students.

Equivalent - Duplicate Degree Credit Not Granted: BUSM 3005 or REAL 3000

REAL 3000 (3) Principles of Real Estate

Introduction to real estate covering a broad spectrum of real estate principles and terms including legal concepts, regulation and land use, industry issues, valuation, financing methods and sources and investment analysis. Excellent elective for all Leeds students and provides the foundation for other real estate courses.

Equivalent - Duplicate Degree Credit Not Granted: BUSM 3005 or REAL 2010

Requisites: Requires prerequisite courses of BCOR 2200 or BASE 2104 and BCOR 2002 (all minimum grade D-). Restricted to Business majors with 52-180 units completed.

REAL 4000 (3) Real Estate Law

Building upon the legal concepts and issues introduced in REAL 3000, this course involves a deeper study of the laws and legal issues impacting and governing real property rights and interests including the acquisition, ownership, possession, use and transfer of real property.

Requisites: Requires prerequisite course of REAL 3000 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

REAL 4100 (3) Real Estate Finance and Investment Analysis

Covers: 1) traditional and alternative financing of residential and commercial real estate; 2) pro forma cash flows and valuation of income generating properties; 3) real estate decisions of non-real estate corporations; and 4) mortgage backed securities and real estate investment trusts (REITs).

Requisites: Requires prerequisite course of REAL 3000 (minimum grade D-). Restricted to Business (BUSN) majors with 52-180 units completed.

REAL 4810 (3) Real Estate Internship

As the capstone course for the Real Estate Certificate program, students are required to complete approximately 150 internship hours over the semester (approximately 10 hours per week). The class component of the course focuses on career options and opportunities in real estate. Contact the Real Estate Center for internship and registration information.

Grading Basis: Pass/Fail

REAL 4820 (3) Topics: Real Estate Development

Broadly looks at real estate development including: 1) what is real estate development, its nature and process; 2) the nature and role of the real estate developer; 3) the many aspects and components of real estate development; 4) the basic feasibility and analysis of a real estate development project. The course delivery utilizes a combination of lecture and discussion, guest speakers, project site tours and real estate case analysis and small group presentations.

Requisites: Restricted to Business (BUSN) majors with 52-180 units completed.

REAL 4825 (3) Experimental Seminar

Offered irregularly to provide opportunity for investigation of new frontiers in Real Estate.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

REAL 4900 (1-3) Independent Study

Intended for exceptionally well-qualified business seniors who desire to study an advanced topic. Must be in Real Estate Certificate Program. Instructor consent required.

REAL 6820 (3-6) Graduate Seminar

Experimental seminar offered irregularly to provide opportunity for investigation of new frontiers in real estate.

REAL 6900 (1-3) Independent Study

Requires consent of instructor under whose direction study is taken. Departmental form required.

Religious Studies (RLST)

Courses

RLST 1620 (3) Religious Dimension in Human Experience

Studies religion as individual experience and social phenomenon. Examines varieties of religious language (symbol, myth, ritual, scripture) and of religious experience (Asian, Western, archaic).

Additional Information: Arts Sci Core Curr: Ideals and Values

RLST 1800 (3) Cyborgs and Robots: Implications for Gender and Religion

Making is the core idea that connects artificial intelligence (cyborgs and robots) with classic literature (Prometheus, Pygmalion, Golem and Frankenstein) and fundamental religious and cultural concerns (Genesis, technology, work). The guiding question is what will humanity and religion be in the future? The goal is less predictive than to set a mandate with potential strategies for those who will create this future.

Grading Basis: Letter Grade

RLST 1818 (3) Introduction to Jewish History: Bible to 1492

Focus on Jewish history from the Biblical period to the Spanish Expulsion in 1492. Study the origins of a group of people who call themselves, and whom others call, Jews. Focus on place, movement, power/powerlessness, gender, and the question of how to define Jews over time and place. Introduces Jews as a group of people bound together by a particular set of laws; looks at their dispersion and diversity; explores Jews' interactions with surrounding cultures and societies; introduces the basic library of Jews; sees how Jews relate to political power.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1818 and JWST 1818

RLST 1820 (3) Religion and Politics in Ancient Egypt

Studies the literature, politics, religions and other traditions of Ancient Egypt.

Repeatable: Repeatable for up to 3.00 total credit hours.

RLST 1828 (3) Introduction to Jewish History since 1492

Surveys the major historical developments encountered by Jewish communities beginning with the Spanish Expulsion in 1492 up until the present day. Studies the various ways in which Jews across the modern world engaged with the emerging notions of nationality, equality and citizenship, as well as with new ideologies such as liberalism, socialism, nationalism, imperialism and antisemitism.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1828 and JWST 1828

RLST 1830 (3) Global History of Holocaust and Genocide

Examines the interplay of politics, culture, psychology and sociology to try to understand why the great philosopher Isaiah Berlin called the 20th century, "The most terrible century in Western history." Our focus will be on the Holocaust as the event that defined the concept of genocide, but we will locate this event that has come to define the 20th century within ideas such as racism, imperialism, violence, and most important, the dehumanization of individuals in the modern world.

Equivalent - Duplicate Degree Credit Not Granted: HIST 1830 and JWST 1830

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context

RLST 1850 (3) Ritual and Media

Ritual continues to play an important role in contemporary societies in both religious and secular contexts. This course examines the elements and genres of ritual activity from African rites of passage to the Beijing Olympics, paying close attention to how the media documents, appropriates and transforms aspects of ritual.

Additional Information: Arts Sci Core Curr: Contemporary Societies

RLST 1900 (3) Introduction to the Hebrew Bible/Old Testament

Examine the content of the Hebrew Bible and critical theories regarding its development. Explore the development of these texts, as well as their foundational role for rabbinic literature and the New Testament. Assess the enduring influence of the Hebrew Bible/Old Testament in world literature and culture (such as in art and music).

Equivalent - Duplicate Degree Credit Not Granted: JWST 1900

Grading Basis: Letter Grade

RLST 1910 (3) Introduction to the New Testament

Examine the background, content and influence of the New Testament books. Studies the diverse perspectives contained in the various books, as well as the process of canonization. Assess the influence of the New Testament on the development of Christianity as well as world (eastern and western) culture.

Equivalent - Duplicate Degree Credit Not Granted: JWST 1910

Grading Basis: Letter Grade

RLST 2200 (3) Religion and Dance

Connecting dancing to religions across the globe demonstrates the near synonymy of the two in most cultures, the remarkable potential for dancing to articulate cultural identity, and finally that dancing is strongly connected to what distinguishes being human. Provides an enriched appreciation of dancing and the introduction to dancing in many cultures.

Grading Basis: Letter Grade

RLST 2202 (3) Islam

Introduces students to foundational Islamic concepts, texts, core practices, historical narratives and intellectual, spiritual and literary traditions. Topics covered include: the figure of Muhammad; the Quran; the emergence of distinct Muslim identities; Hadith; Sharia; Islamic theology; Islamic philosophy; science in Islamic civilization; Islamic mysticism; the impact of colonialism and modernity on the Muslim world; gender and sexuality; political Islam.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Ideals and Values

RLST 2320 (3) The Muslim World, 600-1250

Focusing on the history of the Muslim World in the age of the caliphates, this course takes an interdisciplinary, comparative approach to the development of Islamic society, focusing on social structure, politics, economics and religion. Students will use primary and secondary sources to write a research paper, and make in-class presentations to cultivate critical thinking, research and writing skills.

Equivalent - Duplicate Degree Credit Not Granted: ARAB 2320

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Asia Content

RLST 2400 (3) Religion and Contemporary Society

Explores the role of religion in contemporary society, focusing on debates in religious ethics. Examining diverse voices from Christianity, Judaism and other traditions, this course considers religion's role in debates about issues such as same-sex marriage, climate change, war, criminal justice, torture, sexual ethics, abortion and economic justice.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

RLST 2500 (3) Religions in the United States

Explores the development of various religions within the shaping influences of American culture, including separation of church and state, the frontier experience, civil religion, and the interaction of religions of indigenous peoples, immigrants, and African Americans.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

RLST 2600 (3) Judaism, Christianity, and Islam

Introduces literature, beliefs, practices, and institutions of Judaism, Christianity, and Islam, in historical perspective.

Equivalent - Duplicate Degree Credit Not Granted: JWST 2600

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

RLST 2610 (3) Religions of India

Introduces Hinduism, Buddhism, Jainism and Sikhism, in historical perspective.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

RLST 2612 (3) Yoga: Ancient and Modern

Addresses the history and philosophy of yoga, beginning from its earliest articulations in Vedic India 1200 BCE up to contemporary understandings of yoga. Examines yoga's historical evolution from a primarily mental practice to a bodily centered practice. Looks at the shifts yoga undergoes as it becomes popular in the modern West.

Additional Information: Arts Sci Core Curr: Human Diversity

RLST 2614 (3) Paganism to Christianity

Offers a cultural history of Greek and Roman religion. Students read ancient texts in translation and use evidence from archaeology to reconstruct the shift from paganism to Christianity in antiquity. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2610

Additional Information: Arts Sci Core Curr: Ideals and Values

RLST 2620 (3) Religions of East Asia

Introduces literature, beliefs, practices, and institutions of Taoism, Confucianism, Buddhism, and Shintoism in historical perspective.

Additional Information: GT Pathways: GT-AH3 - Arts Hum: Ways of Thinking

Arts Sci Core Curr: Ideals and Values

Departmental Category: Asia Content

RLST 2700 (3) American Indian Religious Traditions

Introduces religions of the peoples indigenous to the Americas. Concerns include ritual, mythology and symbolism occurring throughout these cultures in such areas as art, architecture, cosmology, shamanism, sustenance modes, trade and history.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2703

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Ideals and Values

RLST 2800 (3) Women and Religion

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism, and goddess traditions.

Equivalent - Duplicate Degree Credit Not Granted: WGST 2800

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities

Arts Sci Core Curr: Human Diversity

RLST 2840 (1-3) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

RLST 3000 (3) Christian Traditions

Serves as an introduction to the academic study of Christianity, understood in its historical context, beginning with its most remote Mesopotamian origins and through to beginnings of the Protestant Reformation. Coverage is global, but "Western" Christian tradition are emphasized, as is the evolution of doctrine, ritual and institutions in relation to social, cultural and political factors.

Additional Information: Arts Sci Core Curr: Historical Context

RLST 3010 (3) Religion and the Senses

Expanding the five common senses so they are grounded on a more fundamental kinesthetic sense, that is, sense of movement, this course focuses on the study of religion and culture on all those marvelous richly and sensuously textured aspects of religious behavior: movement, experience, feeling, action, sensation, gesture, art, music, dancing, architecture, costume, food, and ritual.

RLST 3020 (3) Advanced Writing in Religious Studies

Seminar for religious studies majors that emphasizes the development of writing skills for use inside as well as outside the academy. Writing assignments are focused on one or more core topics in religious studies.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Religious Studies (RLST) majors only.

Additional Information: Arts Sci Core Curr: Written Communication

RLST 3040 (3) The Quran

Explores the Quran from multiple perspectives including literary criticism, ethnomusicology, translation, history, paleography, classical exegesis, Feminist Studies, Judicial interpretation, Islamic philosophy, materiality, Islamic law, spirituality, hip-hop and Jihadism.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

RLST 3050 (3) Religion and Literature in America

Studies religious dimensions of American culture through representative literature, beginning with the Puritans and focusing on diversity in the 19th and 20th centuries.

Additional Information: Arts Sci Core Curr: United States Context

RLST 3060 (3) Fundamentalism and Islam

Explores the global rise of fundamentalism, particularly Islamic fundamentalism. Students will analyze fundamentalism as a function of modernity, and in metaphysical rather than geostrategic or cultural terms. Students will examine the arguments of Muslim fundamentalists, and the counterarguments of their critics.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

RLST 3070 (3) Sufism

Examines the development of Sufism from a piety movement to a social institution. Students will be introduced to classical and modern expressions of Sufism including treatises on spirituality and ethics, commentaries on the Quran, timeless poetry, music and mystical philosophy. Students will learn how Sufism differs across cultural contexts and how it compares to other mystical traditions.

RLST 3100 (3) Judaism

Explores Jewish religious experience and its expression in thought, ritual, ethics, and social institutions.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3100

Additional Information: Arts Sci Core Curr: Historical Context

Departmental Category: Asia Content

RLST 3110 (3) Of Jewish Legends, Folktales and the Supernatural

Explores Jewish traditional legends, folktales and stories of the supernatural. Starts with Aggadic Talmud tales and Midrashic texts and focuses on later rabbinic and mystical texts and folktales ca 500-1900 C.E. from around the Jewish world with subjects ranging from didactic narratives extolling the virtues of the simple pure soul, to the horrors of a blood sucking vampiric outside world.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3110

RLST 3120 (3) Radical Jews

Explores major Jewish figures, and their cultural productions, who were radical in the challenges they posed and transformative in the effects they had on society. The figures we examine range from the Rabbis of the Talmud who revolutionized a sacrificial cult religion, to Western secularist Baruch Spinoza and American icons such as Allen Ginsberg, Gloria Steinem and Bob Dylan.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3120

Grading Basis: Letter Grade

RLST 3200 (3) Hinduism

Studies literature, beliefs, practices, and institutions of Hinduism, in historical perspective.

Additional Information: Departmental Category: Asia Content

RLST 3202 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3201 and JWST 3202 and HEBR 3202

Additional Information: Arts Sci Core Curr: Human Diversity

RLST 3300 (3) Foundations of Buddhism

Introduction to Buddhist thought and practice in the variety of its historical and cultural contexts. The course begins with an exploration of narrative, cosmology, doctrine and ritual in early Buddhism and the Theravada of South and Southeast Asia. Through case studies, we then trace diverse conceptions of the Buddhist path in Tibet and East Asia where the Mahayana spread.

Additional Information: Departmental Category: Asia Content

RLST 3530 (3) Global Seminar: Jews and Muslims - The Multiethnic History of Istanbul

Spend two weeks in Istanbul and examine Jewish-Muslim relations in a place that was for 500 years the crossroads of civilization. The only Muslim city in the 21st century with a large, thriving Jewish community, Istanbul models how people from different social classes, ethnicities and religious backgrounds can coexist.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3530 and JWST 3530

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Human Diversity

RLST 3550 (3) Tibetan Buddhism

Explores Tibetan Buddhism through literature and film, including sacred biographies, treatises on the Buddhist path and films providing a visual window into Tibetan life worlds. We examine different kinds of Tibetan journeys: moving through the life cycle, treading the path of self-cultivation, embarking on solitary retreat, traversing from death to rebirth and traveling on pilgrimage and into exile.

Grading Basis: Letter Grade

RLST 3750 (3) Women in Buddhism

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra, and contemporary issues such as the nun's revival moment.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3750

Additional Information: Departmental Category: Asia Content

RLST 3800 (3) Chinese Religions

Studies classical Confucianism, Taoism, Buddhism, and Neo-Confucianism within the historical context of Chinese culture.

Additional Information: Departmental Category: Asia Content

RLST 3820 (3) Topics in Religious Studies

Intensive study of a selected area or problem in religious studies.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

RLST 3838 (3) Dancing, Religion, and Culture

A critical examination of the received cultural, religious, and academic understandings of dancing and the body; the construction of a richer theory of dancing that will more adequately support comparative studies; the study of dancing in cultures and religions in a diverse representation of cultures; and a more in depth social study of Latin American dancing including actual dancing experience.

RLST 3850 (3) The Mediterranean Religion Before Modernity

Offers an innovative approach to the multifaceted history of Christian-Muslim-Jewish interaction in the Mediterranean. It eschews established paradigms (e.g., Europe, Islamic world) that distort our understanding of these and pushes students to reconsider the accepted paradigms of Western history. Students will reappraise assumptions regarding the nature of ethnic, religious, national and cultural identity, and their role in human history.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 3850

Additional Information: Arts Sci Core Curr: Historical Context

RLST 4030 (3) Religions in America

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5030

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

RLST 4045 (3) Ritual Art Dance Drama

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5045

Grading Basis: Letter Grade

RLST 4050 (3) Topics in Christian Studies

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5050

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

RLST 4170 (3) God and Politics

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5170 and JWST 4170

RLST 4180 (3) Is God Dead?

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5180 and JWST 4180

RLST 4200 (3) Topics in Hinduism

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5200

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 4250 (3) Topics in Buddhism

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America. Department enforced prerequisite: RLST 2610 or RLST 2620 or RLST 3300 or instructor consent.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5250

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Asia Content

RLST 4260 (3) Topics in Judaism

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5260 and JWST 4260

Repeatable: Repeatable for up to 9.00 total credit hours.

RLST 4280 (3) Body and Magic in India

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5280

RLST 4300 (3) Topics in Native American Religions

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5300

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of RLST 2700 (minimum grade C-).

Recommended: Prerequisite 3 additional credit hours of RLST course work or instructor consent.

RLST 4353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5353 and ETHN 4353 and ETHN 5353

RLST 4450 (3) Religion and Nonviolence

Studies theories of nonviolence developed by major thinkers and movements, especially in the U.S., in the context of their religious commitments and beliefs and their historical circumstances.

RLST 4650 (3) Islam in the Modern World

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5650

Recommended: Prerequisite 6 credit hours of religious studies at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 4750 (3) Daoism

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5750 and CHIN 4750 and CHIN 5750

Grading Basis: Letter Grade

Additional Information: Departmental Category: Asia Content

RLST 4800 (3) Critical Studies in Religion

Focuses on a current issue or area of research in the study of religion. Students analyze the way theories develop and learn to develop their own critical analysis. Topics vary, e.g., comparative kingship, colonialism, ritual theories, feminist analysis.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Religious Studies (RLST) majors only.

RLST 4810 (3) Honors Thesis

Students write an honors thesis based on independent research under the direction of a faculty member. Required for students who elect departmental honors.

Additional Information: Arts Sciences Honors Course

RLST 4820 (3) Interdisciplinary Seminar on Religion: Topics

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5820

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Recommended: Requisite 6 credit hours of religious studies at any level or instructor consent.

RLST 4830 (3) Senior Majors Seminar

Topics and instructors vary. Brings advanced majors together in order to focus their major experience on significant topics and issues of common interest.

Requisites: Restricted to students with 87-180 credits (Senior, Fifth Year Senior).

RLST 4840 (1-6) Senior Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

RLST 4850 (3) Gender in Hagiography

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

Equivalent - Duplicate Degree Credit Not Granted: RLST 5850 and WGST 4850

Grading Basis: Letter Grade

RLST 5030 (3) Religions in America

Studies various religious movements in the U.S. and other parts of the Americas. Includes American religion and religions, religion and nationalism, revitalization and religion and Asian religions in America.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4030

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 5045 (3) Ritual Art Dance Drama

Ritual Art Dance Drama as well as the common actions, gestures and objects of culture provide a foundation for cultural and individual concepts and values that may often be characterized as religious. Rich examples drawn from a variety of cultures around the world will be considered from a broad range of theoretical perspectives designed to help us gain the fullest understanding and appreciation of the lived and practiced aspects of culture and religion. Consistent with the fundamental proposition of the course, each student will also engage activities that will provide an experiential basis for learning.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4045

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 5050 (3) Topics in Christian Studies

Studies a particular topic in Christian theology and culture such as early Christianity, medieval Christianity, Christianity in the United States, women and Christianity, liberation theologies, Christianity and literature, and modern Christian thought.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4050

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

RLST 5170 (3) God and Politics

Explores the relationship between religion and politics. Examining traditions such as Judaism and Christianity, this course considers diverse ways in which ancient, medieval and modern sources have imagined the role of religion in civic life. Some topics include the status of religious minorities, the nature of religious freedom and contemporary debates surrounding issues such as torture, sexuality and climate change.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4170 and JWST 4170

Requisites: Restricted to graduate students only.

RLST 5180 (3) Is God Dead?

Explores debates about the following questions: does it make sense to believe in God? Should believing or not believing in God make a difference for how individuals behave? Examining ancient and modern views on the existence and nature of a higher power, this course considers topics including evil and suffering, religion and science and religion's role in politics.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4180 and JWST 4180

Requisites: Restricted to graduate students only.

RLST 5200 (3) Topics in Hinduism

Examines in depth central themes, schools of thought and movements in Hinduism, such as myth and ritual, renunciation, Vedanta, Tantra and Yoga.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4200

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 hours of RLST courses at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 5210 (3) Advanced Readings in Sanskrit

Requires at least two years of prior Sanskrit training. Students will read texts in the original. Class time is devoted to parsing out difficult grammatical structures, discussing the philosophical import of the readings and addressing the historical contexts that assist in interpreting the texts. The topic varies according to student interest.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 2120 (minimum grade C-). Restricted to graduate students only.

Additional Information: Departmental Category: Asia Content

RLST 5250 (3) Topics in Buddhism

Examines in depth central themes, schools of thought and movements in Buddhism, such as Theravada in Southeast Asia, Mahayana and Tantrayana thought, Zen and Buddhism in America.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4250

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Asia Content

RLST 5260 (3) Topics in Judaism

Examines in depth central themes, schools of thought, and movements in Judaism, along with other traditions, across a range of historical periods.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4260 and JWST 4260

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

RLST 5280 (3) Body and Magic in India

Addresses ideas of the body and its use and functions within magic, particularly in Tantric traditions. Uses classical Hinduism and Tantra as a point of departure, focusing on subtle bodies and Tantric bodies and will also supplement this with writing about the body and its connection to mind in contemporary Western thought addressing the mind-body problem.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4280

Requisites: Restricted to graduate students only.

RLST 5300 (3) Topics in Native American Religions

Examines a topic (varies at different offerings) focusing on religions of peoples indigenous to the Americas. May consider mythology; shamanism and medicine; trickster, clown and fool; crisis cult movements.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4300

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 3 additional credit hours of RLST course work or instructor consent.

RLST 5350 (3) Native American Religions: Regional Studies

Studies religion(s) of a single native North American tribe or geographic region within context of history and culture of the tribe.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 additional credit hours of RLST course work or instructor consent.

RLST 5353 (3) Indigenous Traditions and Law: A Global Perspective

Explores intersections of indigenous religions and law through historical and contemporary case studies. American Indian and Hawaiian contexts will be featured, as well as the study of the United Nations Declaration on the Rights of Indigenous Peoples and its recent implementation in places as diverse as Bolivia, Norway and Nagaland. Theoretical issues in the academic study of religion and ethnic studies will be emphasized.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4353 and ETHN 4353 and ETHN 5353

Requisites: Restricted to graduate students only.

RLST 5650 (3) Islam in the Modern World

Globally surveys Islam, covering religion and politics; Islam and the West; the Islamic revival and its varied forms in Iran, Indonesia, Libya and Pakistan; development and change; the status of women; media and academic stereotyping.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4650

Requisites: Restricted to graduate students only.

Recommended: Prerequisite 6 credit hours of religious studies at any level or instructor consent.

Additional Information: Departmental Category: Asia Content

RLST 5750 (3) Daoism

Traces the development of Daoism from its origin as an organized, communal religion in the second century CE to the vibrant living religion of today, encompassing meditative monastics, martial exorcists, solemn ritual masters and lay practitioners of inner alchemy and other self-cultivation techniques. Focuses on the extensive Daoist ritual tradition and the community of believers who created and used it.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4750 and CHIN 4750 and CHIN 5750

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 5820 (3) Interdisciplinary Seminar on Religion

Variable topics in religion, drawing from a variety of disciplines and methodologies as they shed light on specific traditions and issues.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4820

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 5840 (1-6) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 5850 (3) Gender in Hagiography

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources and also examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4850 and WGST 4850

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 6110 (3) Adv Tpcs: Chicana/o Studies: US/Mexico Borderlands

Examines complex histories, cultural practices and liminal, 3rd spaces of the US and Mexico borderlands; racial and gender identities; community formations. Considers a range of autobiographic testimony narratives, films, social and legal studies, and theories of subjectivity that engage with the politics of representation vis a vis the criminalization of Chicana/o and ethnic youth, immigrants and those perceived to be immigrants.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 6110

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

RLST 6830 (3) Introduction to the Academic Study of Religion

Introduction to the graduate academic study of religion through the exploration of contemporary models and issues that demonstrate the nature and future of the field. Students prepares a profile of intended area of research.

Requisites: Restricted to graduate students only.

RLST 6840 (1-6) Independent Study

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

RLST 6940 (1) Master's Degree Candidate

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

RLST 6945 (1-4) Directed Readings: Non-Thesis Option

Course work finished or in the last semester.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

RLST 6950 (1-4) Master's Thesis

Requisites: Restricted to graduate students only.

Russian (RUSS)

Courses

RUSS 1010 (4) Beginning Russian 1

For students with no previous training in Russian.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Russian

RUSS 1020 (4) Beginning Russian 2

Continuation of RUSS 1010. Department enforced prerequisite: RUSS 1010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 1050

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Russian

RUSS 1050 (5) Intensive Beginning Russian

Covers same material as RUSS 1010 and RUSS 1020 combined in one course. Focuses on acquiring basic grammar (all cases for nouns, adjectives and possessives, verb conjugations, in all three tenses), and ability to understand and speak basic everyday Russian. Develops basic reading and writing skills and provides exposure to the fundamentals of the Russian culture.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 1010 or RUSS 1020

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Russian

RUSS 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Russian

RUSS 2010 (4) Second-Year Russian 1

Review and continuation of basic skills learned in the first year: reading, writing, speaking, and oral comprehension. Department enforced prerequisite: RUSS 1020 or RUSS 1050 (minimum grade C-). Satisfies arts and sciences language requirement.

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Russian

RUSS 2020 (4) Second-Year Russian 2

Continuation of RUSS 2010. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

Additional Information: Departmental Category: Russian

RUSS 2211 (3) Introduction to Russian Culture

Provides a chronological overview of civilization in the area now known as Russia, from its beginnings to the end of the Romanov dynasty, paying particular attention to the geographic, social, artistic, economic, and political forces that have combined to give the Russian people and their culture their unique characteristics. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian Courses Taught in English

RUSS 2221 (3) Introduction to Modern Russian Culture

Introduces students to major trends in Russian culture from the 1890's to the present, through the study of literature, art, architecture, music and film in an historical context. Addresses such questions as: how have past events affected Russian society? How can we use knowledge about Russia's past to understand social and cultural forces today? Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: LIBB 2100

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian Courses Taught in English

RUSS 2222 (3) Sports and the Cold War

Explores the multiple connections between sports and international politics during the Cold War in the Post-War period. Examines how the issues of class, nation, ethnicity, and gender intersect with sports and international politics by studying cases from various sport events since 1945.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian

RUSS 2231 (3) Fairy Tales of Russia

Provides a general introduction to fairy tales including various theoretical approaches to classifying and interpreting them; introduces students to a wide selection of Russian folk and fairy tales. Examines the cultural, social and political values they reflect, as well as the continuing influence of fairy tales and folk beliefs in Russian literature, music, folk art, and film, and in the political propaganda of the 20th century. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Literature and the Arts

Departmental Category: Russian Courses Taught in English

RUSS 2241 (3) The Vampire in Literature and the Visual Arts

Introduces students to the folkloric and historic origins of the vampire of contemporary culture. Students will read both Russian and Western literary works, analyzing the image of the vampire as represented in folk narrative, popular fiction and film. Students will learn to apply critical approaches to understanding the vampire metaphorically, symbolically and as a demonized "other". Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 2251 (3) Knights and Amazons: Superheroes in Russian Epics and Film

Immerses students in the mythological past of medieval Russia and introduces them to the legendary warrior heroes and heroines through epic narratives, fairy tales, literature, art, film and animation. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 2261 (3) The Russian Short Story

Introduces students to the short story as a unique literary form, emphasizing the significant contributions of Russian writers to both the short story genre and its criticism. Familiarizes students with various styles and subgenres of the short story, including the romantic, psychological, and supernatural tale, and allegorical and satirical tale. A good introduction to further literary or Russian studies. Taught in English.

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 2471 (3) Women in Russian Culture: From Folklore to the Nineteenth Century

Explores the changing role and cultural images of women as reflected in Russian folklore, historical documents, costumes, icons, paintings and literature from medieval times to 19th century. Focuses on the way Russian women have transgressed boundaries of patriarchy and secured powerful positions in society and culture. Taught in English.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities
Arts Sci Core Curr: Historical Context

Departmental Category: Russian Courses Taught in English

RUSS 2501 (3) Russia Today

Introduces students to post-communist Russia, its politics, values and ideologies. Neither totalitarian nor liberal, contemporary Russia raises numerous questions about such ideological and cultural constructions as neo-liberalism and capitalism, nationalism, globalization, state power and popular vs. high cultures. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Russian Courses Taught in English

RUSS 3000 (3) Advanced Conversation

Enables students to speak and understand contemporary Russian. Discussion topics and source materials vary. Department enforced prerequisite: RUSS 2010 (minimum grade C-).

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 3010 (4) Third-Year Russian 1

Review of Russian grammar coordinated with reading, speaking, writing and understanding modern Russian. Uses some texts from modern Russian literature. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

Additional Information: Departmental Category: Russian

RUSS 3020 (4) Third-Year Russian II

Continuation of RUSS 3010. Department enforced prerequisite: RUSS 3010 (minimum grade C-).

Additional Information: Departmental Category: Russian

RUSS 3060 (4) Advanced Russian for Heritage Speakers (Part 1)

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4010 or RUSS 5010

Additional Information: Departmental Category: Russian

RUSS 3211 (3) History of Russian Cinema

Surveys Russian cinema in historical and cultural context from early 20th century to the present. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3211

Recommended: Prerequisite RUSS 2221 or FILM 1502.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 3231 (3) Laughter in Slavic Cultures

Examines forms, genres and social functions of laughter in Slavic cultures (Russian, Polish, Czech, Serbian and others) and provides an introduction to literature and film of Eastern Europe. All readings are in English. Taught in English.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 3241 (3) Red Star Trek: Russian Science Fiction Between Utopia and Dystopia

Examines Russo-Soviet science fiction in literature and film. Within this popular genre, writers conceive and criticize social utopias, thus creating works situated between the poles of utopia and dystopia. Through discussions of Soviet and post-Soviet science fiction the course introduces a Russo-Soviet "alternative modernity" and studies its historical development. All readings are in English. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 3301 (3) Contemporary Issues in Russian Film

Examines the representation of contemporary Russian society in noteworthy Russian films of the last 20 years. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: FILM 3301

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 3333 (3) Spies Like Us: Espionage in the Culture of the Cold War and Beyond

Explores the figure of the spy in Western and Soviet/post-Soviet imagination of the Cold War period and after. Focuses on the constructions and transformations of the "enemy" concept in modern and post-modern societies.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Russian Courses Taught in English

RUSS 3601 (3) Russian Culture Past and Present

Russian culture from the ninth century to the present. Focuses on interdisciplinary exploration of literature, folklore, art, architecture and music through study in St. Petersburg. Offered abroad only.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian Courses Taught in English

RUSS 3701 (3) Slavic Folk Culture: Ideals and Values in the Contemporary World

Explores contemporary Slavic and American folk practices and investigates the possible origins and consequences of such practices.

Focuses upon the value systems these practices represent, and ways that core values help to define identities and cultures. Topics include folk religion, magic, healing, life cycle and calendar rituals and folk music. Taught in English.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Russian Courses Taught in English

RUSS 3705 (3) Crimes of Passion: Gender and Sexual Politics in Tolstoy's Russia

Examines the historical evolution of gender and sexual politics and the status of women in the late Imperial Russian culture, with particular attention to the writings of Leo Tolstoy and his masterpiece Anna Karenina. Topics-based survey considers debates around marriage, sexuality and gender equality through analysis of primary text by Tolstoy and his contemporaries, as well as secondary materials in gender studies, literary criticism and intellectual history.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Russian Courses Taught in English

RUSS 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Russian

RUSS 3930 (1-6) Russian Internship

Provides an academically supervised opportunity for upper-division students to earn credit while working for public or private organizations. Students apply skills and knowledge earned in the major, and supplement their work experience through directed readings and assignments.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Russian (RUSS) majors only.

Additional Information: Departmental Category: Russian

RUSS 4010 (4) Advanced Conversation and Composition 1

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 3020 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 3060 RUSS 5010

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 4020 (4) Advanced Conversation and Composition 2

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency. Department enforced prerequisite: RUSS 4010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4060 RUSS 5020

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 4050 (3) Professional Russian

Introduces stylistic and idiomatic forms of Russian used in business, politics, media and the Internet. Develops new vocabulary with a special focus on fluency of speech and written communication skills. Offers immersion into the world of contemporary Russian media, politics and culture. Formerly RUSS 3050.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5050

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite RUSS 3020.

Additional Information: Departmental Category: Russian

RUSS 4060 (4) Advanced Russian for Heritage Speakers (Part 2)

Enhances heritage student competence and performance in Russian language. Offers intensive review of Russian grammar and focuses on developing advanced reading, writing and translation skills. Readings are selected from a wide range of contemporary writings that reflect current issues in Russia. Department enforced prerequisite: RUSS 3060 or RUSS 4010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4020 or RUSS 5020

Additional Information: Departmental Category: Russian

RUSS 4120 (3) Russia after Communism: Post-Soviet Politics and Culture

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5120

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4210 (3) Topics in Russian Culture

Selected topics in Russian literature, film, art and music. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5210

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4221 (3) Stalinism: Society and Culture

Examines Soviet society and culture of Stalin period (1929-1953). The Great Terror, communist ideology, shady, commercial practice, political intrigues and show trials, as well as many other aspects of Stalinism will be discussed. Course materials include historical studies, documents, memoirs, diaries, novels and films of or about the period. Taught in English.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Russian Courses Taught in English

RUSS 4230 (3) Russian Cultural Idioms

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Department enforced prerequisite: RUSS 2020 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5230

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 4301 (3) American-Russian Cultural Relations

Surveys the development of American-Russian cultural relations from the second half of the 18th century to the present. Examines the character and significance of Russian-American relations in social, intellectual, artistic, and other spheres from a comparative perspective. Taught in English. S. context.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Historical Context

Arts Sci Core Curr: United States Context

Departmental Category: Russian Courses Taught in English

RUSS 4401 (3) The Russian Jewish Experience

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5401 and JWST 4401

Recommended: Prerequisite any 1000 or 2000-level undergraduate literature course.

Additional Information: Arts Sci Core Curr: Literature and the Arts

Departmental Category: Russian Courses Taught in English

RUSS 4431 (3) Dostoevsky

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5431

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4441 (3) Tolstoy

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5441

Recommended: Prerequisite lower division literature course.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4451 (3) Chekhov

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5451

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4471 (3) Women in 20th-21st Century Russian Culture

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4471 and RUSS 5471

Recommended: Prerequisite lower level literature or culture course.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Russian Courses Taught in English

RUSS 4481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5481 and IAFS 3621

Grading Basis: Letter Grade

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Russian Courses Taught in English

RUSS 4811 (3) 19th Century Russian Literature

Surveys background of Russian literature from 1800 to 1900. Russian writers and literary problems in the 19th century emphasizing major authors: Pushkin, Lermontov, Gogol, Dostoevsky, Turgenev, Tolstoy, and Chekhov. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4811

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 4821 (3) 20th Century Russian Literature and Art

Interdisciplinary course emphasizing the influence of literature and art in 20th century Russian literature. Follows the changing cultural landscape from the time when Russia was in the vanguard of modern European literature to the period of Stalinism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: HUMN 4821

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Russian Courses Taught in English

RUSS 4831 (3) Contemporary Russian Literature

Acquaints students with the most representative works of Russian writers after the collapse of the Soviet regime. Examines the relationships between ideological concepts and aesthetics, and the treatment of moral and social issues in recent literary works. All readings are provided in translation. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Arts Sci Core Curr: Contemporary Societies

Departmental Category: Russian Courses Taught in English

RUSS 4841 (3) History of Modern Russian Drama

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5841

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4851 (3) Critical Thinking: Russian Film and Society

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5851

Recommended: Prerequisite RUSS 2221 or RUSS 3301 or FILM 3301.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4861 (3) Absurd and Supernatural in Russian Literature

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharms, Bulgakov, Siniavskii, Petrushevskaia and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 5861

Recommended: Prerequisite one lower level literature or culture course.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 4900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Russian

RUSS 5010 (4) Advanced Russian Seminar

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4010

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian

RUSS 5020 (4) Advanced Russian Seminar 2

Review of all aspects of Russian grammar, with a focus on difficulties, vocabulary for communication at an advanced level and contextual usage. Includes intensive writing and editing of compositions on a variety of topics, reading of authentic Russian texts, interactive work with Russian media and fluent conversation in Russian that moves beyond functional proficiency.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4020

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian

RUSS 5050 (3) Professional Russian

Introduces graduate and advanced undergraduate students to various stylistic registers of Russian (business, politics, the Internet, TV, etc.). Develops new vocabulary and idiomatics, with a special focus on fluency of speech and written communication skills. Along with language training, the course offers an immersion into the world of contemporary Russian media, politics and culture.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4050

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian

RUSS 5110 (3) Slavic Culture and Society

Examines important ideologies and myths in Slavic societies, with emphasis on contemporary movements and their reinterpretation of history. Acquaints students with major tools for study of cultures of Eastern Europe and the post-Soviet states: research methods, bibliography, transliteration, critical thinking and writing skills. Required for Russian MA.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5120 (3) Russia after Communism: Post-Soviet Politics and Culture

Explores the process of the re-invention and re-shaping of the Russian national identity after the collapse of the communist society. Topics will include the formation of neoconservative and neo-imperialist agenda (Ukraine crisis), growth of the anti-western attitudes and the protest movement against Putin's politics. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4120

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5210 (3) Topics in Russian Culture

Selected topics in Russian literature, film, art and music. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4210

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5230 (3) Russian Cultural Idioms

Focuses on the critical analysis of the Russian cultural discourse through Russian idioms. Taught in Russian. Formerly GSLL 5230.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4230

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian

RUSS 5352 (3) Russian Novel: Theory and Practice

Examines the Russian novel and its evolution as well as Western and Russian theories of the novel as they engage and reflect upon the claims of modernity. Taught in English. Formerly GSLL 5352.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5401 (3) The Russian Jewish Experience

Examines the experience of Russian Jews from the late 19th century to the present through fiction and films dealing with challenges of co-existence of Jews and their neighbors; Bolshevik Revolution, Stalinism, Holocaust, post-Stalin period; place of Jews as individuals and a minority within Russian and Soviet society; and emigration to America and elsewhere at the turn of the century. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4401 and JWST 4401

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5431 (3) Dostoevsky

Focuses on close reading of major novels and other works by Dostoevsky, one of the most important psychological novelists in modern literature, a profound religious thinker and the greatest crime novelist in the world. Taught in English. Formerly GSLL 5431.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4431

RUSS 5441 (3) Tolstoy

Examines the development of Tolstoy's thought and literary style through study of one of his novels and short works from different periods of Tolstoy's writing. Taught in English. Formerly GSLL 5441.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4441

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5451 (3) Chekhov

Analyzes the life and creative works of the author of some of the funniest and some of the gloomiest stories in Russian literature. Examines Chekhov's major plays that laid the foundation for modernist theatre. Taught in English. Formerly GSLL 5451.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4451

RUSS 5471 (3) Women in 20th-21st Century Russian Culture

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English. Formerly GSLL 5471.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4471 and WGST 4471

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5481 (3) Rogues to Revolutionaries: Russian Rebels, Past and Present

Explores the tradition of dissent and opposition in Russian culture, from the medieval period to present, approaching forms of rebellion (religious, political, social, aesthetic) in historical context. This survey in intellectual history will trace this phenomenon across historical documents, literary texts, film, and the fine and performing arts, pairing these primary materials with readings in Russian history. Taught in English. Formerly GSLL 5481.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4481 and IAFS 3621

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5830 (3) Topics in Literature and History

Taught in English. Formerly GSSL 5830.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5841 (3) History of Modern Russian Drama

Examines Russian plays of the 20th and 21st centuries (from Chekhov to contemporary authors) in the context of the Western theatre theory. Surveys most influential directorial styles from Stanislavsky's "method" to contemporary verbatim theatre. All readings are in English. Taught in English. Formerly GSSL 5841.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4841

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5851 (3) Critical Thinking: Russian Film and Society

Through structured discussions, selected readings and written assignments, examines topics in Russian film from socio-historical and cultural studies perspectives. Taught in English. Formerly GSSL 5851.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4851

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5861 (3) Absurd and Supernatural in Russian Literature

Studies themes of grotesque, bizarre, surreal, absurd, supernatural and fantastic in Russian short stories and novels of the 19th and 20th centuries. Discusses works by Pushkin, Gogol, Dostoevsky, Kharmis, Bulgakov, Siniavskii, Petrushevskaiia and Pelevin, within contexts of Russian folklore, Freud and Jung's interpretations of jokes and dreams and Romanticism. Taught in English. Formerly GSSL 5861.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4861

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Russian Courses Taught in English

RUSS 5900 (1-6) Independent Study

See department for registration information. Department enforced requisite: graduate standing or instructor consent.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Russian

RUSS 6940 (1-3) Master's Degree Candidate

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Russian

RUSS 6950 (1-6) Master's Thesis in Russian

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Russian

Sanskrit (SNSK)

Courses

SNSK 1010 (3-4) Introductory Sanskrit 1

Repeatable: Repeatable for up to 4.00 total credit hours.

Additional Information: Departmental Category: Sanskrit

SNSK 1020 (3-4) Introductory Sanskrit 2

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 1020 (minimum grade C-).

Additional Information: Departmental Category: Sanskrit

SNSK 2110 (3-4) Intermediate Sanskrit 1

Continued study of the grammar of classical Sanskrit and translation of selected readings from the literature.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 1020 (minimum grade C-).

Additional Information: Departmental Category: Sanskrit

SNSK 2120 (3-4) Intermediate Sanskrit 2

Continuation of SNSK 2110.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of SNSK 2110 (minimum grade C-).

Additional Information: Departmental Category: Sanskrit

Scandinavian (SCAN)

Courses

SCAN 1202 (3) Tolkien's Nordic Sources and the Lord of the Rings

Examines the Nordic aspect of J.R.R. Tolkien's work, especially The Lord of the Rings. Concentrates on the Nordic saga tradition, mythology, folklore and fairy tales Tolkien used as his sources. Students will explore the transformations of these sources from prehistoric times to contemporary cinematic adaptations, while paying special attention to cultural appropriations, national revisions and political alterations. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 2201 (3) Introduction to Modern Nordic Culture and Society

Provides a comprehensive introduction to modern Nordic culture and society. Surveys the history of Nordic countries and examines their culture using art, architecture, literature, and film. Studies social issues, environmental concerns, and political patterns. In profiling aspects of culture and society unique to Nordic countries, students arrive at a conception of a collective Nordic identity. Taught in English.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Nordic Studies Courses Taught in English

SCAN 2202 (3) The Vikings

Examines the social, cultural, technological, and artistic backgrounds of the Viking experience, charting the history of the period both within the Nordic region and Europe as well as North America. Additionally, looks at some of the lasting influences of the Vikings on Western civilization. Taught in English.

Additional Information: Arts Sci Core Curr: Historical Context
Departmental Category: Nordic Studies Courses Taught in English

SCAN 2900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3020 (3) Advanced Readings in Scandinavian

Develops the type of advanced reading knowledge of the four closely related Scandinavian languages (Swedish, Danish and the two Norwegian standards) that will prepare students for their senior thesis and for possible graduate work. Readings will help students see relationships and connections operating across national and linguistic borders within the Nordic region. Department enforced prerequisites: NORW 2120 and NORW 3900 or SWED 3900 (all minimum grade C-).

Additional Information: Departmental Category: Norwegian
Departmental Category: Swedish

SCAN 3110 (3) Topics in Contemporary Nordic Society and Culture

Provides insight into cultural adaptations, political struggles and social transformations taking place in the contemporary Nordic world. Subjects treated vary according to current developments in the region, student interest and faculty availability.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3201 (3) Contemporary Nordic Society and Culture

Explores contemporary Nordic culture and society with special focus on Iceland. Emphasis is on the relationship between historical, geographic, artistic, and political forces in Iceland and their effects on culture and society. Provides insight into the life and attitudes of contemporary Icelanders and stresses their place in the global culture of today. Taught in English.

Recommended: Prerequisite SCAN 2201.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3202 (3) Old Norse Mythology

Surveys the mythology and heathen cult practices of the Old Norse world. Students learn to read mythological texts and study the major gods (Odin, Thor, Frey and Freyja, among others), along with other mythological beings. Examines and evaluates evidence for beliefs and cult practices in texts, art, archeological finds and other sources. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3203 (3) 19th & 20th Century Nordic Literature

Examines the Nordic region's influence on social realism, expressionism, and postwar literature, including such themes as women in society, nature and industrialization, and identity and angst. May include works by Ibsen, Strindberg, Dinesen, and Nobel Prize winners Lagerlof, Hamsun, Undset, and Lagerkvist. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3204 (3) Medieval Icelandic Sagas

Advanced introduction to medieval Icelandic saga with readings in the family, outlaw, skald, and legendary sagas as well as the main scholarly approaches to this unique literature. Topics include honor, blood feud, fate, sexuality/gender, oral composition, and legend. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3205 (3) Scandinavian Folk Narrative

Introduces the rich tradition of Scandinavian oral narrative. Looks at relationships between the various genres of oral narrative and their historical, social, and cultural contexts. Genres studied may include ballad, fairy tale, rural legend, and urban legend. Explores various interpretive methodologies. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3206 (3) Nordic Colonialisms

Examines Nordic colonial enterprise and the relationship between the Scandinavian center and colonial peripheries from the Arctic to the Caribbean, Africa, and India. Studies colonial and postcolonial cultures, and postcolonial criticism and theory. Taught in English.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3208 (3) Women in Nordic Society: Modern States of Welfare

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3208

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3209 (3) Contemporary Nordic Literature and Film

Advanced introduction to contemporary Nordic literature and film. Readings/screenings of recent translated Nordic texts and films, presenting a broad spectrum of contemporary issues, along with current critique and theoretical approaches. Topics: history, culture, translation, gender/sexuality, national identity, minority issues, etc. Taught in English.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3301 (3) Radical Nationalism in Contemporary Northern Europe

Examines the current rise of National Socialists, white supremacists, ethnic separatists, anti-Islam activists and social and cultural ultraconservatives in northern Europe. Treats extremist nationalism as a social, cultural, aesthetic, intellectual and political movement. Consults scholarship from sociology, criminology and political science, as well as music, literature, art and film. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3630

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3506 (3) Scandinavian Drama

Examines the many contributions of Scandinavian dramatists to world theater from the 18th century to the present. With emphasis on Holberg, Bjornson, Ibsen, Strindberg, and Bjorneboe, surveys Enlightenment comedy, national romanticism, realism, naturalism, symbolism, expressionism, and Brechtian epic theater. Taught in English.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Nordic Studies Courses Taught in English

SCAN 3631 (3) Arctic Society and Culture

Investigates representations of the Arctic in literature, art, cinema, media and scientific, and geographical writing over the past century and a half, spanning material from North America, Britain, continental Europe and the Nordic region. Interpretive approaches include ecocriticism; post-colonialism; literary studies; indigenous studies; visual, film and media theory; Cold War studies.

Equivalent - Duplicate Degree Credit Not Granted: IAFS 3631

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

SCAN 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Nordic Studies Courses Taught in English

Sewall Residential Acad Prgm (SEWL)

Courses

SEWL 1020 (1-3) Topics-Social Sciences 1

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

SEWL 2000 (3) America, the Environment, and the Global Economy

Examines the debate over globalization and the global environmental crisis. Does increasing global economic development threaten to undermine the environment? What role should America play in the development of a sustainable economy?

Equivalent - Duplicate Degree Credit Not Granted: SOCY 1002

Additional Information: Arts Sci Core Curr: Ideals and Values

SEWL 2020 (1) Civic Engagement

Explores the concept of citizenship through readings, discussion, and service-learning. Working with Sewall faculty mentors, students discuss citizenship and related topics and learn concretely about aspects of the larger community by choosing a local community organization, becoming actively involved in its programs, and presenting their work at a culminating symposium.

Repeatable: Repeatable for up to 4.00 total credit hours.

Grading Basis: Pass/Fail

Sociology (SOCY)

Courses

SOCY 1001 (3) Introduction to Sociology

Examines basic sociological ideas including social relations, social interaction, social structure, and social change. Examples are drawn from societies around the world.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: General Sociology

MAPS Course: Social Science

SOCY 1004 (3) Deviance in U.S. Society

Examines the social construction of deviance in the U.S., the process of acquiring a deviant identity and managing deviant stigma, and the social organization of deviant act, lifestyles, relationships and careers.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Departmental Category: Deviance and Criminology

SOCY 1006 (3) The Social Construction of Sexuality

Discusses the social determinants of sexuality. Analyzes the economic, psychological, and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

Equivalent - Duplicate Degree Credit Not Granted: WGST 1006

Additional Information: Departmental Category: Sex and Gender

SOCY 1016 (3) Sex, Gender, and Society 1

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

Equivalent - Duplicate Degree Credit Not Granted: WGST 1016

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Departmental Category: Sex and Gender

SOCY 1021 (3) United States Race and Ethnic Relations

An examination of race and minority problems in U.S. society, including the psychological, social, and cultural sources of prejudice and discrimination.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: United States Context

Departmental Category: General Sociology

SOCY 1022 (3) Ethics and Social Issues in U.S. Health and Medicine

Explores current ethical and policy issues in U.S. health and medical practices. Includes such issues as alcohol and drug abuse, organ transplants and substitutes, genetic engineering, contraception, abortion, occupational safety and health, and euthanasia.

Additional Information: Arts Sci Core Curr: Ideals and Values

Departmental Category: Population and Health Issue

SOCY 1841 (1-6) Independent Study in Sociology

Repeatable: Repeatable for up to 7.00 total credit hours.

Additional Information: Departmental Category: General Sociology

SOCY 2011 (3) Contemporary Social Issues and Human Values

Explores contemporary societies on a global scale. Focuses on such issues as capitalism, socialism, race and ethnic problems, sex discrimination, poverty and the concentration of wealth, crime and deviance, human rights and human values, peace and war.

Additional Information: Departmental Category: General Sociology

SOCY 2021 (3) Nonviolence and the Ethics of Social Action

Examines nonviolence as a strategy of social action. Focuses on ethics and dynamics of nonviolent action; racial and economic justice movements; civil disobedience; and conscientious objection to war.

Additional Information: Departmental Category: General Sociology

SOCY 2031 (3) Social Problems

Examines U.S. society from a normative perspective emphasizing theories of social change. Considers such problems as distribution of power, unemployment, poverty, racism and sexism, the changing role of the family, and drugs.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Ideals and Values

Departmental Category: General Sociology

SOCY 2034 (3) Drugs in United States Society

Examines the relationship between drugs and social contexts. Lends insight into why people find consciousness alteration meaningful, what kinds of experiences and problems arise, and what types of social policies emerge to control drug use.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 2044 (3) Crime and Society

Explores issues related to crime, the criminal justice system, and crime-related public policy. It addresses what we know about crime and how we know it, how our society responds to crime, and how the institutions designed to address crime (police, courts, corrections) function.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 2044

Additional Information: Departmental Category: Deviance and Criminology

SOCY 2061 (3) Introduction to Social Statistics

Introduces students to quantitative analysis of social phenomena. Emphasizes understanding and proper interpretation of graphs; measures of central tendency, dispersion, and association; and the concept of statistical significance. Assumes students have only limited mathematical background.

Additional Information: Departmental Category: General Sociology

SOCY 2077 (3) Environment and Society

Examines how both natural and built environments influence human behavior and social organization. Focuses on microenvironments and their influence on individuals; the impact of macroenvironments on societal organization; and environmental movements.

Additional Information: Arts Sci Core Curr: Ideals and Values

Departmental Category: Environment and Society

SOCY 2080 (3) Sociology of the Helping Professions

Investigates how today's helping professionals are trained and socialized to care for clients, the challenges they face in working within modern bureaucracies and with advanced technologies and the importance of inter-professional care.

Additional Information: Departmental Category: General Sociology

SOCY 2091 (3) Topics in Sociology

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content. Students may receive credit for this course up to three times for different topics.

Repeatable: Repeatable for up to 9.00 total credit hours.

Additional Information: Departmental Category: General Sociology

SOCY 2092 (3) Sex, Power and Reproduction

Examines fertility, contraception and abortion with an emphasis on demographic trends, social stratification and policy impacts. Sociological, demographic and public health perspectives will be presented.

SOCY 3001 (3) Classical Theory

In-depth study of classical sociological theorists, particularly Marx, Durkheim, and Weber. Examines their roles in defining the discipline of sociology.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade C-). Restricted to students with 27-180 credits (Sophomore, Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3002 (3) Population and Society

Examines population, its structure and processes, and its relationships to selected areas of the social structure. Examines Malthusian, neo-Malthusian, and Marxist perspectives.

Requisites: Restricted to Sociology (SOCY) majors only.

Additional Information: Departmental Category: Population and Health Issue

SOCY 3011 (3) Contemporary Theory

Continuation of SOCY 3001. In-depth study of modern and post-modern theories of the 20th century, including structural-functionalist, conflict, symbolic interactionist, feminist, and world system theories.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3012 (3) Women and Development

Investigates the status of women in the context of globalization and social and economic development.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3012

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Population and Health Issue

Departmental Category: Asia Content

SOCY 3016 (3) Marriage and the Family in U.S. Society

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3016

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: United States Context

Departmental Category: Sex and Gender

SOCY 3032 (3) Social Epidemiology

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision and health care delivery systems.

Additional Information: Departmental Category: General Sociology

SOCY 3041 (3) Self and Consciousness

Explores human development from a psychosocial perspective, focusing on the interplay between psychological patterns and social forms. Issues such as self-image and social consciousness are studied within the larger context of individual and collective forces leading to transformation.

Equivalent - Duplicate Degree Credit Not Granted: INVS 3041

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3042 (3) Topics in Population and Health

A variety of courses in population and/or health will be taught, usually by visiting lecturers. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Additional Information: Departmental Category: Population and Health Issue

SOCY 3044 (3) Race, Class, Gender, and Crime

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3044 and WGST 3044

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 3045 (3) Sociology of Death and Dying

Addresses sociological aspects of thanatology (the study of death and dying). Includes study of the social meaning of death and its normative treatment in western civilization, with a focus on the contemporary United States.

Requisites: Requires a prerequisite course of SOCY 1001 or SOCY 3001 (minimum grade D-).

Additional Information: Departmental Category: Population and Health Issue

SOCY 3046 (3) Topics in Sex and Gender

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: WGST 3046

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sex and Gender

SOCY 3052 (3) Medical Sociology

Explores the role of medicine and medical systems in society. How does society shape health, how does health shape social position, and how do societies make sense of health and illness? Topics may include epidemiology, social demography of health, social stress, health behavior, experiences of illness and recovery, health care provision, and health care delivery systems.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Population and Health Issue

SOCY 3141 (3) Social Movements in the U.S

Considers theory and research about American social movements.

Emphasizes leadership, ideology, recruitment, strategy, organizational dynamics, public response, and reasons for success or failure.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: General Sociology

SOCY 3151 (3) Self in Modern Society

Explores how modern social institutions and culture shape our personal experiences, how personal experiences can affect the nature of those, institutions and culture, and how strategies can be developed for achieving balance between the individual and society.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Ideals and Values

Arts Sci Core Curr: United States Context

Departmental Category: General Sociology

SOCY 3161 (3) Sociological Perspectives on Race and Ethnicity

Addresses three subtopics of race from a sociological perspective: ethnic and racial identities, immigration, and race and ethnicity in Latin America.

Recommended: Prerequisite SOCY 1001 or SOCY 1021.

Additional Information: Departmental Category: General Sociology

SOCY 3171 (3) Whiteness Studies

Uses the conceptual framework of the sociology of race and ethnic relations to explore whiteness as a racial category that is centered and privileged in American society. Investigates the development of whiteness from past white supremacy, current colorblindness, to possible future multiculturalism. Analyzes the consequences of whiteness as a racial identity and a social structure.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Additional Information: Departmental Category: General Sociology

SOCY 3201 (3) Sociological Research Methods

Introduces students to the logics and methods of sociological research. This requirement for majors teaches ways to answer sociological questions by collecting and analyzing different types of data. Students are trained in research ethics and learn how to collect their own data and conduct original sociological research. Collection and analysis of both qualitative and quantitative data are included.

Requisites: Requires prerequisite course of SOCY 2061 or ANTH 4000 or EBIO 4410 or ECON 3818 or GEOG 3023 or IPHY 2800 or MATH 2510 or PSCI 2075 or PSYC 2111 or EDUC 4716 (minimum grade C-). Restricted to Sociology (SOCY) majors only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Sociology

SOCY 3301 (3) Survey Methods

Teaches quantitative research methods and, particularly, methods of survey research. Topics include sampling, interviewing, schedule construction, data analysis, computer methods, index construction, and statistical analysis. Students participate in a survey project, design, collect data, and prepare a research paper on the basis of collected data.

Requisites: Requires prerequisite courses of SOCY 2061 and SOCY 3001 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 3314 (3) Violence Against Women and Girls

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class, and sexuality in gendered violence.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3314 and WGST 3314

Recommended: Prerequisite SOCY 1016 or WGST 1016.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 3401 (3) Field Methods

Skill development prepares students to conduct qualitative sociological research. Emphasizes ethnographic techniques, including intensive interviewing, direct observation, coding, participant observation, and report writing. Students conceive and execute a field research project with data collection, analysis, and a report.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4000 (3) Gender, Genocide and Mass Trauma

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4010

Recommended: Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

Additional Information: Departmental Category: Sex and Gender

SOCY 4002 (3) Sociology of Aging

Studies present and future roles of the aged in the family, the community, and the larger society. Considers economic, political, and health consequences of various retirement systems.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: Population and Health Issue

SOCY 4004 (3) Advanced Topics in Criminology

Variety of courses in criminology. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4007 (3) Global Human Ecology

Examines global environmental issues from sociological perspectives. Focuses on such problems as overpopulation, world hunger and poverty, pollution, resource shortages, environmental impact of technology and population dynamics, public policy, and strategies for change.

Equivalent - Duplicate Degree Credit Not Granted: SEWL 2000

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: Environment and Society

SOCY 4010 (3) Sociology Capstone Course: Professional Writing

Builds on previous coursework in survey or field methods to result in an original, article-length research paper analyzing sociological data. Students will hone their writing skills through in- and -out-of-class writing exercises, and read and analyze models of quantitative and qualitative sociological articles to develop sociological writing skills.

Requisites: Requires a prerequisite course of SOCY 3301 or SOCY 3401 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: General Sociology

SOCY 4014 (3) Criminology

Examines the scientific study of types of criminal behavior and explanations for criminal behavior, with special attention to social factors affecting criminal behavior.

Requisites: Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4016 (3) Sex, Gender and Society 2

Studies status and power differences between the sexes at individual, group, and societal levels. Examines empirically established sex differences, and reviews biological, psychological, and sociological explanations for gender differences.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4016

Requisites: Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sex and Gender

SOCY 4017 (3) Animals and Society

Examines the role of non-human animals in human society. Investigates the social construction of the human/animal boundary. Challenges ideas that animals are neither thinking nor feeling. Examines the many ways humans rely on animals. Considers the link between animal cruelty and other violence. Explores the moral status of animals.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-).

Additional Information: Departmental Category: Environment and Society

SOCY 4021 (3) Conflict Management in Social Systems

Explores conflict resolution theory and method as applied to interpersonal, intergroup, and interorganization conflict.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-).

Additional Information: Departmental Category: General Sociology

SOCY 4024 (3) Juvenile Justice and Delinquency

Examines the history, incidence and prevalence of delinquent behavior among youth.

Requisites: Requires a prerequisite course of SOCY 1001 or SOCY 1004 or SOCY 2044 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Deviance and Criminology

SOCY 4027 (3) Inequality, Democracy, and the Environment

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between (a) inequality and democratic decision making and (b) undemocratic decision making; U.S. and corporate food and energy policy; and global environmental degradation. Focuses on the role that global inequality plays in fostering environmental degradation.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4027

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Environment and Society

SOCY 4030 (3) Sociology of Climate Change

Examines the human drivers and causes of climate change, the health and security risks it creates and the efforts of societies to mitigate and adapt to its effects.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 4030

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Environment and Society

SOCY 4031 (3) Social Psychology

Studies individuals in social context. Reviews philosophical and sociological treatments of the relation between the individual and society. More specific topics include the socialization process, theories of human development and personality formation, language acquisition, conformity, aggression, sex differences in personality and gender identity, and the relation between attitudes and overt behavior.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4037 (3) Hazards, Disasters and Society

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 5037

Requisites: Requires a prerequisite course of SOCY 2077 (minimum grade D-).

Additional Information: Departmental Category: Environment and Society

SOCY 4042 (3) Economic Sociology

Defines relationship between economy and society; sociological approach to study of economic activity and organization; difference from the theoretical and methodological assumptions orienting the discipline of economics; tackles these questions in two ways: studies foundations as established in works of Smith, Marx, Weber, Polanyi, and Schumpeter, and considers current research in economic sociology, focusing on concepts of markets, networks, and embeddedness.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) Sociology (SOCY) majors only.

Additional Information: Departmental Category: Population and Health Issue

SOCY 4047 (3) Topics in Environment and Society

Variety of courses taught by visiting and regular faculty. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Environment and Society

SOCY 4052 (3) Social Inequalities in Health

Focuses on social inequalities in health in both U.S. and international contexts. Reviews the link between health status and various types of social statuses, including but not limited to socioeconomic status, gender, race and ethnicity. Explanations for the relationships between these factors and various health outcomes are discussed. Focuses on multiple levels of analysis, from the physician-patient interactions to health care systems and social policies. Students have the opportunity to develop their own specific research interests in this field.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Population and Health Issue

SOCY 4062 (3) Suffering and Care in Society

Examines how modern societies understand and respond to the reality of human suffering, how care systems are organized, and the experiences of professional caregivers.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Population and Health Issue

SOCY 4063 (3) Risk and Resilience in Society

Explores the growing dangers of modern life and the ability of society and its members to recover from epidemics, terrorism, financial disasters, natural catastrophes and other harmful events. Special attention is given to the social (as opposed to the individual) sources of risk and resilience and their implications for the helping professions.

Additional Information: Departmental Category: General Sociology

SOCY 4071 (3) Social Stratification

Studies theories of class, ethnic, sex, and age stratification. Examines social inequality in the United States and analyzes the resulting conflicts.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 5071

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4081 (1-3) Sociology of Education

Analyzes the school as a social organization. Among topics considered are power and control in the school; classroom interaction and its relation to learning and personality development in students; roles of educators; and reciprocal relations of school and community.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: General Sociology

SOCY 4084 (3) Punishment, Law and Society

Places the current state of punishment in the U.S. in historical and cross national context. Examines key features of penal systems and key sociological theories about the relationship between punishment and society.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 4084

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 2044.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4086 (3) Family and Society

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic, and economic determinants of family formation.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4086

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: Sex and Gender

SOCY 4104 (3) The Death Penalty in America

Examines the historical and international use of capital punishment, and then focuses on its use and status in the United States in this century, with a special look at Colorado. Critically examines the arguments for and against capital punishment. The inmates on death row and their families will be examined, as well as the needs of families of homicide victims.

Requisites: Requires a prerequisite course of SOCY 4014 (minimum grade C-).

Additional Information: Departmental Category: Deviance and Criminology

SOCY 4117 (3) Food and Society

Examines the food system along the lines of social justice and environmental sustainability. Investigates the institutional and cultural supports of major food system problems and contemporary efforts to address those problems, including the realms of food production, processing, distribution, marketing, policy, regulation, consumption, and activism.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Environment and Society

SOCY 4121 (3) Sociology of Religion

Examines complex interactions between religious and other social structures, such as the economy, government, and the family, and how globalization is affecting religious traditions across the globe. Includes discussion of how various religions are used or misused to justify terrorism and other acts of violence.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Ideals and Values
Departmental Category: General Sociology

SOCY 4131 (1-3) Advanced Topics in Sociology

Variety of advanced specialty courses taught by visiting and regular faculty designed for upper division sociology majors. See current departmental announcement for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4132 (3) Gender, Islam and Modernity

Examines gender in contemporary Muslim societies, with emphasis on Asia and the Middle East. Explores issues such as veiling, feminism, sexuality, family, women's participation in politics and social movements.

Requisites: Requires prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

SOCY 4141 (3) The Social Psychology of Friendships

Studies friendships between individuals and groups, applying social psychological theories of interaction and group processes. Examines the effects of hierarchies of status and power and of norms and social pressure on friendships. Attempts to answer questions like how social categories like gender, race, and class affect friendships, what are the unwritten rules of behavior among friends in different situations, and what happens when we violate them.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4160 (3) Designing Social Innovations

Introduces students to theory and research on social entrepreneurship with special emphasis on the role of design thinking.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

SOCY 4161 (3) Executing Social Innovations

Introduces students to the skills and strategies involved in developing a business plan for a social business or an organization wanting to increase its social impact.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

SOCY 4441 (3) Senior Honors Seminar 1

Helps students design and initiate an honors thesis based on original sociological research.

Requisites: Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Arts Sciences Honors Course
Departmental Category: General Sociology

SOCY 4451 (3) Senior Honors Seminar 2

Helps students complete an honors thesis based on original sociological research. Emphasizes analyzing data, writing research reports, and presenting results.

Requisites: Requires prerequisite courses of SOCY 3001 and SOCY 3301 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Arts Sciences Honors Course
Departmental Category: General Sociology

SOCY 4841 (1-8) Independent Study in Sociology

Upper-division variable credit. Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4911 (1-3) Teaching Sociology

Students participate in a teaching seminar under the supervision of a faculty member. Includes pedagogical strategies for implementing concrete educational goals and encouraging higher levels of creativity and analysis in a large, lower-division class. Emphasizes mentorship and personal development. Instructor consent required.

Requisites: Requires a prerequisite course of SOCY 1001 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4931 (1-6) Internship in Sociology

Provides an academically supervised opportunity for junior and senior sociology majors to work in public or private organizations to gain practical knowledge and experience, and allows students to make a connection between sociological theory and the "real world". Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires a prerequisite course of SOCY 3001 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Sociology (SOCY) majors only.

Additional Information: Departmental Category: General Sociology

SOCY 4932 (3) Internship in Care, Health and Resilience

Provides an academically supervised opportunity for juniors and seniors interested in the helping professions to work in a job that provides them valuable hands-on experience, allows them to apply insights learned in their formal coursework and helps them make informed career choices upon graduation.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Population and Health Issue

SOCY 5031 (3) Research Design

Principles and practice of social research, including the nature of scientific explanation, the relationship between theory and research, research design, measurement problems, sampling questionnaire construction, interviewing, ethnographic methods, and statistical analysis.

Additional Information: Departmental Category: General Sociology

SOCY 5037 (3) Hazards, Disasters and Society

Explores the societal dimensions of hazards and disasters, emphasizing disaster theory and research, key issues in the sociological study of disasters, social vulnerability, the impacts of disasters in the U.S. and worldwide and the U.S. Emergency Management System.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4037

Additional Information: Departmental Category: Environment and Society

SOCY 5071 (3) Social Stratification

Studies theories of class, ethnic, sex, and age stratification. Examines social inequality in the United States and analyzes the resulting conflicts.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4071

Additional Information: Departmental Category: General Sociology

SOCY 5111 (3) Data 1: Introduction to Social Statistics

Introduces statistical analysis in the social sciences. Introduces basic techniques of inferential statistics and several bivariate statistical techniques including t-test for the difference in means, chi-square independence, analysis of variance (ANOVA), correlation, and simple regression (OLS). Prepares students for the required course on multivariate regression techniques (Data 2).

Requisites: Restricted to Sociology (SOCY) graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 5181 (3) Logics of Qualitative Inquiry

A required first-year seminar that introduces the logics of qualitative inquiry in sociology. Introduces the history of qualitative epistemology. Considers the logic of common qualitative methodologies and qualitative research representations. Engages with the logics of inquiry in classic and more recent well regarded qualitative sociological works.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Sociology

SOCY 5201 (3) Graduate Seminar in Sociological Theory

Examines theoretical approaches to core issues and problems in sociology, including the nature of society, the relationship between society and the individual, the role of culture and social structure, the sources of social power, and the conceptual structure of sociological knowledge itself.

Requisites: Restricted to Sociology (SOCY) graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 5611 (3) Teaching in Sociology

Learn how to teach sociology more effectively while developing a new content area and a clearer sense of the field. Choose a content area within sociology as the basis for planning a course and developing and practicing different teaching techniques. Department enforced prerequisite: enrollment in the Sociology graduate program.

Additional Information: Departmental Category: General Sociology

SOCY 5841 (1-6) Independent Study in Sociology

Graduate variable credit. Instructor consent required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: General Sociology

SOCY 5937 (1-6) Graduate Research Internship in Environmental Sociology

Offers the opportunity for sociology graduate students specializing in environmental sociology to work with local governmental or non-profit organizations on research assignments. The research topic, academic reading list, and expectations for the final project will be developed collaboratively with a faculty sponsor and organizational representative.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Environment and Society

SOCY 6004 (3) Topics in Criminology

Variety of courses in criminology to be taught by visiting lecturers. See current departmental announcements for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 6007 (3) Foundations of Environmental Sociology

Provides overview of environmental sociological theory and research including topics such as: public environmental perception, concern, and knowledge; environmentalism as a social movement; environmental justice; energy, technology, and risk; human dimensions of environmental change; and natural hazards and disasters.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 6007

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environment and Society

SOCY 6012 (3) Population Issues, Problems, and Policies

Presents contemporary perspectives on relations between population and society. Focuses on mortality, fertility, and migration, the major demographic areas, with reviews of specific demographic phenomena and controversies.

Additional Information: Departmental Category: Population and Health Issue

SOCY 6016 (3) Topics in Sex and Gender

Covers diverse specializations of faculty in the area of sex and gender. See current departmental announcements or online Schedule Planner for specific content.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sex and Gender

SOCY 6017 (3) Inequality, Democracy, and the Environment

Focuses on the structural forces affecting environmental degradation and environmental behavior by examining the relationships between a) inequality and democratic decision making and b) undemocratic economic and political decision making, U.S. and corporate food and energy policy; and global environmental degradation. Focus will also be placed on the role that global inequality plays in fostering environmental degradation.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environment and Society

SOCY 6041 (3) Cultural Sociology

Explores "the cultural turn" in sociology and related disciplines. Reviews basic themes in cultural studies: distinguishing "cultural" and "social"; narrative as catalyst between symbols and practices; cultural production processes; self as embodied; culture and power; methods and epistemological issues. Students present their own projects in class and as research papers.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6111 (3) Data 2: Data Analysis

Introduces students to mainstream multivariate regression techniques used in the social sciences. The majority of the course focuses on the Ordinary Least Square model and on the extension of this model to nominal, ordinal and count dependent variables. Students analyze data of their choosing with statistical software packages including SPSS, SAS, and STATA. Department prerequisite: SOCY 5111 or equivalent.

Additional Information: Departmental Category: General Sociology

SOCY 6121 (3) Qualitative Methods

Training in the systematic observation of people in situations, finding them where they are, staying with them in a role acceptable to them that allows intimate observations of behavior. Students report their findings in ways useful to social science but not harmful to those observed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6821 (1-2) Graduate Sociology Forum 1

Introduces first-year graduate students to the full range of substantive topics, research programs, and other projects in which graduate sociology faculty are engaged. Provides a forum in which issues of the discipline are presented and discussed. Features weekly presentations by graduate sociology faculty.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6831 (1) Graduate Professional Seminar

Offers guidance and instruction on topics related to advanced graduate study and academic life beyond graduation. Discussions will include writing journal articles; creating a vitae; writing dissertations; applying for grants and other sources of funding; the academic job search; and what to expect as a junior faculty member.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6841 (1-6) Guided Research in Sociology

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 6851 (2) Interdisciplinary Social Science Professional Socialization

Trains graduate students and provides professional socialization in interdisciplinary social science research. Open to all interested students, with programming provided by the Institute of Behavioral Science. Sessions include IBS-housed colloquia and workshops in professional socialization, technological tools, interdisciplinary research, ethics, grant writing, etc. Students workshop and submit a research paper.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 6831

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Sociology

SOCY 6941 (1) Candidate for Degree for Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: General Sociology

SOCY 6951 (1-6) Master's Thesis

Additional Information: Departmental Category: General Sociology

SOCY 7002 (3) Social Disparities in Health

Presents social disparities in health in their social context. Includes the sociology of health behavior; links between health status and social statuses including gender, race, ethnicity, and socioeconomic status; fundamental causes and other explanations for social disparities in health; environment and health; health insurance disparities; the physician-patient interaction and its consequences.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Population and Health Issue

SOCY 7004 (3) Criminological Theory

Examines the major criminological theories of the 18th through 21st centuries in Europe, Australia, and the U.S. Emphasizes the historical contexts and paradigms of knowledge influencing these theories.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7006 (3) Sociology of Sex and Gender

Theoretical and empirical examination of sex stratification, sex role differentiation, and sex differences in socialization, personality, institutions, and culture.

Additional Information: Departmental Category: Sex and Gender

SOCY 7012 (3) The Social Demography of Race

Introduction to relevant, timely research within sociological and social demographic research on race and ethnicity. Specific areas will include conceptual/measurement issues; population size, growth, and migration; health and mortality; marriage, family, and fertility; socioeconomic context; and policy considerations. Course content will be structured around current empirical pieces in sociology literature with emphasis on methodological approach in analyses.

Additional Information: Departmental Category: Population and Health Issue

SOCY 7014 (3) Gender, Race, Class, and Crime

Examines crime and the criminal legal system practices through the lens of intersecting oppressions, particularly racism, sexism, heterosexism and classism.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 6014

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7017 (3) Population and Environment

Reviews research on human-environment interactions, with a focus on ways in which demographic processes influence, and are influenced by, the environmental context. Specific topics include conceptual and analytical frameworks; methodologies; intervening factors shaping human dimensions of environmental change; and regionally-focused research.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Environment and Society

SOCY 7024 (3) Punishment and Social Control

Exploration of sociological perspectives on the criminal justice process. Considers organization of criminal law responses, including enforcing and sentencing. Race, class, gender, and age differences in treatment and sentencing are analyzed.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7026 (3) Feminist Research Methods

Epistemological and methodological issues generated by feminist research and students' own projects.

Additional Information: Departmental Category: Sex and Gender

SOCY 7034 (3) Capital Punishment in the United States

Surveys the history and current status of capital punishment in the United States, with a critical examination of arguments both for and against the death penalty.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Deviance and Criminology

SOCY 7036 (3) Feminist Theory

Examines the main schools of feminist thought and their impact upon sociological theories. Also examines current feminist theoretical debates and their relevance to feminist sociology.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Sex and Gender

SOCY 7111 (3) Data III--Advanced Data Analysis

Denotes third graduate course in sequence of quantitative methods. Following basic inferential statistics (SOCY 5111) and multivariate regression analysis (SOCY 6111), students study advanced statistical techniques such as event history analysis, multilevel modeling, structural equation modeling, and latent class analysis.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of SOCY 6111 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 7121 (3) Qualitative Analysis

Drawing on data gathered through participation, observation and in-depth interviewing, students focus on developing theoretical analyses and exploring classical and post-modern ethnographic writing formats. Students present and revise their papers as well as review journal articles. Department enforced prerequisite: SOCY 6121.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 7131 (3) Seminar in Social Psychology

Studies the individual in social context. Focuses on theoretical perspectives and substantive issues specific to sociological and social psychology, including socialization, the self, social roles, language, deviance, gender, collective behavior, group processes, attitudes and behavior, social norms, and conformity.

Additional Information: Departmental Category: General Sociology

SOCY 7141 (3) Third-year Paper Seminar

Guides graduate students through the creation of the required third-year paper and helps establish productive writing habits. Includes assigned readings, discussion, peer review, and specific tasks related to scholarly writing. Students will revise and defend the paper during the semester following the seminar. Department enforced prereqs., SOCY 5111 and SOCY 5201.

Requisites: Restricted to Sociology (SOCY) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: General Sociology

SOCY 7171 (3) Special Topics

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: General Sociology

SOCY 8991 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: General Sociology

Spanish (SPAN)

Courses

SPAN 1000 (3) Cultural Difference through Hispanic Literature

For freshmen only. Organized around the general topic of cultural differences. Focuses on a related issue such as gender or history articulated in the literature of Spain, Latin America, and the Hispanic United States. Taught in English; students read selected literary texts in English from the various traditions. Does not count towards the Spanish major.

Requisites: Restricted to students with 0-26 credits (Freshmen) only.

Additional Information: GT Pathways: GT-AH2 - Arts Hum: Lit Humanities Arts Sci Core Curr: Literature and the Arts Departmental Category: Spanish

SPAN 1010 (5) Beginning Spanish 1

Offers students a firm command of Spanish grammar. Grammar is used as a point of departure for development of oral skills. Reading and writing are stressed to a lesser degree. Attendance at the language laboratory may be mandatory.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 1150

Additional Information: Arts Sci Core Curr: Foreign Language Departmental Category: Spanish

SPAN 1020 (5) Beginning Spanish 2

Continuation of SPAN 1010. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1010 (min. grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SPAN 1150

Additional Information: Arts Sci Core Curr: Foreign Language Departmental Category: Spanish

SPAN 1150 (5) Intensive First Year Spanish

An intensive beginning course covering the same material as SPAN 1010 and 1020. Attendance at the language laboratory may be mandatory.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 1010 and SPAN 1020 SPAN 1010

Additional Information: Arts Sci Core Curr: Foreign Language Departmental Category: Spanish

SPAN 2110 (3) Second-Year Spanish 1

Grammar review. Emphasizes reading, writing, and speaking skills. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 1020 (min. grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SPAN 2150

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Spanish

SPAN 2120 (3) Second-Year Spanish 2

Grammar review. Emphasizes reading, writing and speaking skills. Attendance at the language laboratory may be mandatory. Department enforced prerequisite: SPAN 2110 (min. grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SPAN 2150

Additional Information: Departmental Category: Spanish

SPAN 2150 (5) Intensive Second-Year Spanish

Intensive review of grammar and other subjects covered in SPAN 2110 and SPAN 2120. Attendance at the language laboratory may be mandatory.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 2110 or SPAN 2120 SPAN 2110

Requisites: Requires prerequisite course of SPAN 1020 (minimum grade C-).

Additional Information: GT Pathways: GT-AH4 - Arts Hum: Foreign Languages

Arts Sci Core Curr: Foreign Language

Departmental Category: Spanish

SPAN 2450 (3) Catalan for Spanish Speakers

Offers an intensive introduction to the Catalan language for those able to speak Spanish. By the end of the course students should be able to communicate well in all language-skills areas: listening comprehension, speaking, reading and writing. Students will also have gained a better understanding and appreciation of the Catalan singularity.

Recommended: Prerequisite SPAN 3000 or placement or five semesters of college Spanish or department consent required.

Additional Information: Departmental Category: Spanish

SPAN 3000 (5) Advanced Spanish Language Skills

Transitional course that introduces students to the Spanish major and improves their writing skills. Involves composition, reading, and to a lesser extent, conversation.

Requisites: Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3001 (3) Spanish Conversation

Emphasizes vocabulary acquisition and speaking fluency. Through structured and carefully monitored individual, group, and class work, students achieve enduring language growth and meaningful acculturation that otherwise could only be achieved through an extended stay in an Hispanic country. This course is intended for those who are learning Spanish as a second-language. Native speakers of Spanish who have pursued formal education in a Spanish speaking country will not be admitted to the course. Heritage speakers of Spanish (native speakers who have pursued formal education in a non-Spanish speaking setting) as well as students from bi-lingual K-12 programs must meet with the coordinator to determine appropriate class level. Does not count toward the Spanish major or minor.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 3002

Requisites: Requires prerequisite course of SPAN 2120 or SPAN 2150 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3002 (3) Advanced Spanish Conversation

Focuses on refining fluency in both informal and formal discourse through group discussions, class work and individual and group presentations in order to prepare students for communication in professional settings. To that end, the materials used in the course will emphasize themes and problems relevant to the contemporary Hispanic world.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 3001

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3010 (3) Advanced Rhetoric and Composition

Designed to refine expository and argumentative writing in Spanish, this course will center around four main areas of study: culture, linguistics, sociopolitical and economic reality, and literature and criticism. A multi-draft process-based approach will guide the writing and revision of essays. Additionally, there will be a focus on grammar and lexical issues most challenging for students at the third-year level.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Written Communication
Departmental Category: Spanish

SPAN 3030 (3) Professional Spanish for Business 1

Includes the study of business vocabulary, business concepts, geographic context, and cultural context.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3040 (3) Professional Spanish for Business 2

Complements SPAN 3030 with a focus on different business topics and countries. Emphasizes interpreting and elementary translation. Attention is given to the writing of resumes and application letters, as well as the entire job search process.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3050 (3) Spanish Phonology and Phonetics

Designed to teach some of the methods, techniques, and tools of descriptive linguistics as they apply to articulatory phonetics. Students analyze important contrasts between sounds of Spanish and English by means of phonetic transcription.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3060 (3) Spanish for Careers in Environmental Studies and Sustainable Development

Provides advanced Spanish language competency and transcultural knowledge of issues pertaining to the environment, energy and sustainable development in the Spanish-speaking world. Students will develop a critical apparatus for analyzing, reading, listening, speaking and writing about the social, cultural and economic parameters of these countries and the U.S.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 3070 (3) Spanish 21st Century Media Professions

Develops advanced Spanish language skills, trans-cultural knowledge and regional and historical understanding necessary for using Spanish in media related professions. Examines the production, representations and cultural meaning of Hispanic and Latino media within the United States and globally drawing on films, videos and readings in political economy, cultural studies, history and sociology. Students create five media products in Spanish.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 3080 (3) Spanish Health Professions

Develops advanced Spanish language competency and trans-cultural knowledge and skills for health related contexts both in the United States and abroad in order to develop a critical apparatus for analyzing, reading, listening, speaking and writing about health and understanding health fields in historical and sociocultural contexts of the Spanish speaking world.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 3100 (3) Literary and Cultural Analysis in Spanish

Fosters critical thinking and the ability to discuss texts from a historical, sociological, ideological and formalistic viewpoint. Analyzes literary and cultural expressions from Latin America, Spain and the US Latino traditions in different genres, ranging from fiction to poetry, and media from the written word to cinema and other visual arts.

Additional Information: Departmental Category: Spanish

SPAN 3120 (3) Advanced Spanish Grammar

Analysis of texts from morphological and syntactic perspectives. Structural and semantic characteristics of major features of Spanish are studied at the sentence level. Use of these grammatical features is then studied in selected literary texts.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3150 (3) Linguistic Analysis of Spanish

Introduces students to fundamental areas of linguistic analysis with special attention paid to Spanish (and Portuguese). The structural systems of language will be introduced (principles of sound patterns, word formation, meaning, and sentence structure). Different types of language variation will be discussed (historical, social, regional).

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3200 (3) Spanish Culture

Examines historical bases of modern Spain's cultural and political currents. Department enforced prerequisite: SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 3215 (3) Urban History and Culture in the Spanish-Speaking World

Understanding the complex history, social fabric, material life and cultural diversity of Latin American and Iberian cities is the goal of this course, which in its iterations will be devoted to analyzing and discussing different urban centers on either side of the Atlantic Ocean. Materials from a wide variety of media and genres such as literature, visual arts, historiography, film, will be used. Taught in Spanish.

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3220 (3) Latin American Culture: Spanish America and Brazil

Examines literary, artistic, and philosophical currents in Spanish America and Portuguese America (Brazil), from pre-Columbian times to the present.

Equivalent - Duplicate Degree Credit Not Granted: PORT 3220

Requisites: Requires prerequisite course of SPAN 3000 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3230 (3) Discovering Barcelona: Culture and Heritage

Presents more than 2,000 years of Barcelona's cultural heritage in the city of Barcelona from the Romans to the present. We will read works by locals and foreign authors to understand how the city has been a hub of the European and Mediterranean cultures for centuries. A faculty sponsored Global Seminar to Barcelona, Spain, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

Additional Information: Departmental Category: Spanish

SPAN 3240 (3) Catalan Culture 1: Nation and Art

Introduces students to the literary, artistic and historical currents of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people, its capital Barcelona, and a distinct culture and language. Examines national identity and major works from renowned Catalan artists, spanning architecture, painting and literature, like Dali, Gaudi, or Miro. Department enforced prerequisite: SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 3250 (3) Catalan Culture 2: Contemporary Trends and Barcelona

Introduces students to the contemporary social and cultural trends of Catalonia as they take place mainly in its capital Barcelona. Examines current developments in fields such as theatre, art, fashion, cooking, urban design or architecture. Department enforced prerequisite: SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 3260 (3) Late 19th and 20th Century Argentine Narrative

Considers a series of late 19th and 20th century canonical works from several genres (poetry, short story, essay, and the novel). Students will acquire a very specific knowledge of late 19th and 20th century Argentine literature, its relationship to specific social actors and specific historical processes. A faculty sponsored Global Seminar to Rosario, Argentina, offered through the Study Abroad Program. Department enforced prerequisite: SPAN 3000 or equivalent.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 3270 (3) Barcelona: Understanding Local and Immigrant Cultures

Explores the history of Barcelona, a cosmopolitan city that is one of the oldest in Europe, from an interdisciplinary, European perspective that emphasizes the city's cultural diversity and pluralism. A range of historical, literary, artistic, and sociological texts will be examined. Taught in Spanish. Offered through the Study Abroad program. Department enforced prereq., SPAN 3000.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Spanish

SPAN 3280 (3) Introduction to Catalan Literature & Film

Introduces students to the rich and diverse literary and film traditions of Catalonia, an economically vibrant area of the Iberian Peninsula with 10 million people and a distinct culture and language. Department enforced prerequisite: SPAN 3000 or equivalent. Course taught in Spanish.

Additional Information: Departmental Category: Spanish

SPAN 3310 (3) 20th Century Spanish Literature

Surveys leading writers of Spain from 1898 until the present.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3340 (3) 20th Century Spanish American Literature

Introduces contemporary Spanish American literature.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 3700 (3) Selected Readings: Spanish Literature in Translation

Introduces selected Spanish literature masterpieces. Taught in English. Will not count toward major requirements.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 3800 (3) Selected Readings: Latin American Literature in Translation

Introduces selected Latin American (Spanish and Portuguese) literature masterpieces. Taught in English. Does not count toward the Spanish major.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: Spanish

SPAN 4060 (3) Problems of Translation for Professions in Spanish 1

Develops skills in English-Spanish and Spanish-English translation and interpretation.

Requisites: Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4070 (3) Problems of Translation for Professions in Spanish 2

Presents documents from different professional areas (business, health, media and environmental studies and sustainable development) which are studied, prepared, translated and discussed in context in order to enable students to perform successfully in real translation situations.

Requisites: Requires a prerequisite course of SPAN 3000 and SPAN 3010 or SPAN 3030 or SPAN 3040 or SPAN 3060 or SPAN 3070 or SPAN 3080 or SPAN 3120 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4110 (3) Hispanic Women Writers

Discusses the image of women in Spanish literature through the centuries using works by representative female writers.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4120 (3) Literature and Cinema in Spain and Latin America

Studies film and fiction in different periods and about main topics of the Hispanic world. It will provide a historical and cultural overview, introduce students to film theory, narrative theory and the vocabulary associated with both, and integrate critical texts about all the material studied.

Topics may vary each semester. This course will be taught entirely in Spanish.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4130 (3) The Power of Storytelling: Oral, Textual and Digital Narratives

Examines the ways in which oral, textual and digital narratives have shaped, and continue to shape, our lives and the different communities we inhabit. Looks at stories of the Spanish tradition produced in a variety of historical settings and across different media.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 4150 (3) Major Works and Trends in Literature and Culture in Spain Up to 1700

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from its origins to the end of the Baroque period,

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4160 (3) Major Works and Trends in Literature and Culture in Spain: 1700-Present

Examines major works and trends in literature, visual arts and/or other cultural expressions of Spain from 1700 to the present day.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4170 (3) Major Works/Trends in Literature and Culture in Latin America Up to the 19th Century

Examines major works and trends in literature, visual arts and/or other cultural expressions of Latin America from the colonial period to the end of the 19th century.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4180 (3) Major Works and Trends in Literature and Culture in Latin America: 1900-Present

Examines major works of literature, visual arts and/or other cultural expressions of Latin America from the beginning of the 20th century to the present day.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4215 (3) Spanish in the United States

Describes the linguistic characteristics of U.S. Spanish, Spanish-English bilingualism and direct contact, including the study of borrowing, code switching, phonological and grammatical convergence, leveling, accommodation and attrition, among other linguistic phenomena. Discusses the relationships between language and identity, as well as the role of Spanish in U.S. education, media and social institutions.

Requisites: Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

Grading Basis: Letter Grade

Additional Information: Departmental Category: Spanish

SPAN 4220 (1-3) Special Topics in Spanish and/or Spanish American Literature

Examines intensively particular topics or issues concerning Spanish and/or Spanish American literature selected by the instructor.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4230 (3) Special Topics in Luso-Brazilian and/or African Literature

Designed to examine intensively particular topics or issues concerning the literatures of Portugal, Brazil and/or the African countries of Portuguese

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of PORT 3230 and SPAN 3100 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4430 (3) Special Topics in Hispanic Linguistics

Examines intensively particular topics or issues concerning Hispanic linguistics selected by the instructor.

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4450 (3) Introduction to Hispanic Linguistics

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5450

Requisites: Requires a prerequisite course of SPAN 3000 or SPAN 3010 or SPAN 3050 or SPAN 3120 or SPAN 3150 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4620 (3) Cervantes

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3120 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4650 (3) Methods of Teaching Spanish

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5650

Requisites: Requires a prerequisite course of SPAN 3000 and SPAN 3010 and SPAN 3002 or SPAN 3030 or SPAN 3040 or SPAN 3050 or SPAN 3150 or SPAN 3200 or SPAN 3220 or SPAN 3240 or SPAN 3250 or SPAN 3280 or SPAN 3310 or SPAN 3340 (all minimum grade C-).

Additional Information: Departmental Category: Spanish

SPAN 4660 (6) High School Spanish Teaching

Part of supervised secondary school teaching required for state certification to teach Spanish. These hours do not count toward student hours in the major nor in the total departmental hours allowed. Pass/Fail only.

Requisites: Requires prerequisite course of SPAN 4650 or SPAN 5650 (minimum grade D-).

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Spanish

SPAN 4840 (1-3) Independent Study

Departmental approval required.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 4930 (1-4) Languages Internship for Professions

Participants interested in public service or management-oriented careers in government or business are able to work as interns in public sector agencies or in private industry, on campus, or abroad.

Requisites: Requires prerequisite course of SPAN 3100 (minimum grade C-).

Recommended: Prerequisites SPAN 3200 and an additional course above SPAN 3000.

Additional Information: Departmental Category: Spanish

SPAN 4980 (1) Methods Language Learn/Pedagogy

Required, intensive mini-course for teaching assistants in Spanish and Portuguese. Provides teachers with the opportunity to learn about language learning theory and pedagogy.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 4990 (3) Spanish Honors Thesis

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Recommended: 18 hours of upper-division Spanish, 3.00 GPA overall, and 3.50 GPA in Spanish.

Additional Information: Arts Sciences Honors Course
Departmental Category: Spanish

SPAN 5120 (1-3) Seminar: Spanish Literature and/or Spanish American Literature

Selected topics in Spanish and/or Spanish American literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5130 (1-3) Seminar: Critical Approaches to Hispanic Literature

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7130

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5140 (3) Seminar: Spanish Literature, Medieval Period

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7140

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of SPAN 5420 or SPAN 7420 (minimum grade D-). Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5200 (3) Seminar: Spanish Literature, Renaissance and Baroque

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5210 (2-4) Seminar: Spanish Literature, 18th and/or 19th Centuries

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7210

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5220 (1-3) Seminar: Spanish Literature, 20th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7220

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5300 (2-4) Seminar: Spanish American Literature, Colonial Period and/or 19th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7300

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5320 (1-3) Seminar: 20th Century Spanish American Literature

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7320

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5400 (2-4) Seminar: Spanish Phonology

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7400

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5410 (2-4) Seminar: Spanish Syntax

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7410

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5430 (1-3) Seminar: Hispanic Linguistics

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7430

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5440 (3) Seminar: Trends in Hispanic Linguistics

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5450 (3) Introduction to Hispanic Linguistics

Introduces students to the main areas of inquiry within the field of Hispanic linguistics. Topics to be covered include speech and language, phonetics and phonology, morphology and syntax, semantics, linguistic change and variation and Spanish spoken in the United States.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 4450

Additional Information: Departmental Category: Spanish

SPAN 5460 (3) Topics in Spanish Applied Linguistics

Treats topics within the scope of Spanish first and second language acquisition and the speech of bilinguals. Other topics include contrasting linguistics, interlingual stages of learning and code switching as they relate to language acquisition.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 7460

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 5650 (3) Methods of Teaching Spanish

Familiarizes students with current methodology and techniques in foreign language teaching. Peer-teaching coupled with opportunity to teach mini-lessons provide students with actual teaching experience in the foreign language classroom.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 4650

Additional Information: Departmental Category: Spanish

SPAN 6840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 6940 (1) Master's Degree Candidate

Requisites: Restricted to Spanish (SPAN) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Spanish

SPAN 6950 (1-6) Master's Thesis

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7120 (1-3) Seminar: Spanish Literature and/or Spanish American Literature

Selected topics in Spanish and/or Spanish American literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5120

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7130 (1-3) Seminar: Critical Approaches to Hispanic Literature

Treats various topics and genres as needs and resources dictate. Gives special attention to theoretical and critical analysis of Hispanic literature with greatest emphasis on contemporary trends. Genres might include narrative, poetry and theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5130

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7140 (3) Seminar: Spanish Literature, Medieval Period

Studies medieval works, authors and themes, with consideration of principal influences from other literatures. Reading in Old Spanish.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5140

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7200 (3) Seminar: Spanish Literature, Renaissance and Baroque

Treats various topics, as needs and resources dictate. Special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include Renaissance poetry in Spain, Cervantes, Don Quixote and Novelas ejemplares, picaresque novel and the Spanish comedia of the 17th century.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5200

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7210 (2-4) Seminar: Spanish Literature, 18th and/or 19th Centuries

Treats various topics as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include romantic prose, poetry and theatre, realism and naturalism (prose narrative), 19th century poetry and 19th century theatre.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5210

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7220 (1-3) Seminar: Spanish Literature, 20th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include the generation of 1898, poetry of the 20th century, theatre of the 20th century, pre-Civil War novel, and post-Civil War novel.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5220

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7300 (2-4) Seminar: Spanish American Literature, Colonial Period and/or 19th Century

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include pre-Columbian literature, colonial prose and narrative, colonial poetry, romantic novel, the realist and naturalist novel and short story, 19th-century poetry, and gaucho literature.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5300

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7320 (1-3) Seminar: 20th Century Spanish American Literature

Treats various topics, as needs and resources dictate. Gives special attention to developing historical and current theoretical and critical background of each topic. Representative topics might include modernism, theatre, the essay, the regional novel, the novel of the Mexican Revolution, the modern novel, contemporary theatre, and contemporary poetry.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5320

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7400 (2-4) Seminar: Spanish Phonology

Topics within Spanish phonology are treated as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics might include generative phonology applied to Spanish, Spanish phonology for college teaching and different schools of Spanish phonology.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5400

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7410 (2-4) Seminar: Spanish Syntax

Treats topics within Spanish syntax, each requiring a semester's study, as needs and resources dictate. Gives special attention to different schools and contemporary theoretical developments. Representative topics may include generative/transformational grammar applied to Spanish, fundamental problems in Spanish syntax and different schools of Spanish syntax.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5410

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7430 (1-3) Seminar: Hispanic Linguistics

Studies a major topic from an area such as phonology, syntax, history of the Spanish language, Hispanic linguistics and literature, or applied Hispanic linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5430

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Spanish

SPAN 7440 (3) Seminar: Trends in Hispanic Linguistics

Provides an overview of major trends and issues in Hispanic linguistics, including phonology, syntax, dialectology, sociolinguistics, discourse analysis, text linguistics, semiotics, history of the Spanish language, language acquisition and applied linguistics.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5440

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 7460 (3) Topics in Spanish Language Acquisition and Applied Linguistics

Treats topics within the scope of Spanish first and second language acquisition and the speech of bilinguals. Other topics include contrasting linguistics, interlingual stages of learning and code switching as they relate to language acquisition.

Equivalent - Duplicate Degree Credit Not Granted: SPAN 5460

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Spanish

SPAN 8840 (1-3) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

SPAN 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Spanish (SPAN) graduate students only.

Additional Information: Departmental Category: Spanish

Speech, Language, & Hearing Sciences (SLHS)

Courses

SLHS 1010 (3) Disabilities in Contemporary American Society

Addresses the issue that 50 percent of all individuals experience disability in their lifetime. Introduces students to the social, cultural, psychological, economic, political, legal, and health-care issues related to society and individuals with disabilities.

Additional Information: Arts Sci Core Curr: Contemporary Societies
Departmental Category: Didactic: All-Department

SLHS 2000 (3) Introduction to Communication Disorders

Surveys communication disorders, including hearing impairments, learning disabilities, and speech-language disorders, as well as an introduction to basic speech and hearing science.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 2010 (3) Science of Human Communication

Discusses how human communication (the process by which a thought is transmitted from the brain of a speaker to the brain of a listener) involves a complex interaction of acoustics, anatomy, physiology, neurobiology, and psychology.

Additional Information: Arts Sci Core Curr: Natural Science Non-Sequence
Departmental Category: Didactic: All-Department

SLHS 2305 (4) American Sign Language 1

Introduces basic sign vocabulary, grammatical structures of ASL, and the culture of deaf people. Classes are taught using ASL without the use of spoken English.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: American Sign Language

SLHS 2315 (4) American Sign Language 2

Develops more complex vocabulary and grammatical structures, and an understanding of deaf culture. Classes are taught using ASL without the use of spoken English.

Requisites: Requires a prerequisite course of SLHS 2305 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: American Sign Language

SLHS 2325 (4) American Sign Language 3

Continuation of SLHS 2315. Covers ASL literature, advanced grammatical structures, idiomatic expressions, and deaf culture. Meets core requirement for a foreign language.

Requisites: Requires a prerequisite course of SLHS 2315 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: American Sign Language

SLHS 3003 (3) Cognitive Science

Introduces cognitive science, drawing from psychology, philosophy, artificial intelligence, neuroscience, and linguistics. Studies the linguistic relativity hypothesis, consciousness, categorization, linguistic rules, the mind-body problem, nature versus nurture, conceptual structure and metaphor, logic/problem solving and judgment. Emphasizes the nature, implications and limitations of the computational model of mind.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 3702 and LING 3005 and PHIL 3310 and PSYC 3005

Recommended: Prerequisites two of the following CSCI 1300 or LING 2000 or PHIL 2240 or PSYC 2145.

SLHS 3006 (3) Phonetics

Focuses on production of speech sounds, transcribing speech using the International Phonetic Alphabet, analyzing the acoustic properties of speech sounds, understanding how speech sounds vary depending on the context. Provides a foundation for understanding normal and atypical speech development, atypical speech problems and patterns, regional and foreign accents, and speech recognition by computers.

Requisites: Requires a prerequisite course of LING 2000 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 3014 (3) Hearing Loss Epidemiology

Introduces students to basic epidemiological concepts related to hearing loss. Provides an overview of the hearing mechanism, assessment and identification of hearing loss, prevalence of hearing disorders, treatment and intervention. Noise pollution, aging and toxic agents are discussed. Focuses on risk factors for hearing impairment and comorbidities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 3106 (3) Hearing Science

Focuses on the three main aspects of the hearing process: sounds in the environment (physical acoustics), sounds encoded within the auditory system (physiological acoustics) and perception of sound (psychological acoustics).

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-). Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 3116 (3) Speech Science

Provides a basic understanding of the structural organization (anatomy), function (physiology), and neural controls of the structures used to produce speech, swallowing, respiration, and related behaviors in humans.

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-).

Recommended: Prerequisite SLHS 3106.

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 4000 (3) Multicultural Aspects of Communication Differences and Disorders

Examines perceptions and attitudes regarding differences in communication as a function of cultural-linguistic diversity. Discusses implications of differing verbal and nonverbal communication styles of various cultural groups in terms of professional responsibilities.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite upper-division standing and a minimum of 60 credit hours.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 4100 (1-3) Special Topics in Speech, Language, and Hearing Sciences

Studies selected topics in speech, language, hearing sciences, communication disorders, and other professional issues.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 4502 (3) Language Disorders: Child and Adult

Language disorders can result from problems with cognitive, linguistic, and/or discourse processing. The theoretical framework of language dysfunction is addressed while drawing upon real clinical examples of language disorders that have been observed in children and adults.

Requisites: Requires a prerequisite or corequisite course of SLHS 4560 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 4512 (3) Speech Disorders: Voice, Cleft Palate, Motor Disorders, Stuttering

Provides students with an introductory understanding of specific speech disorders including voice disorders, neurogenic speech disorders, articulation and phonological disorders and craniofacial disorders in children and adults.

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 4560 (3) Language Development

Covers the development of language in childhood and into adult life, emphasizing the role of environment and biological endowment in learning to communicate with words, sentences, and narratives.

Equivalent - Duplicate Degree Credit Not Granted: LING 4560 and PSYC 4560

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) undergraduate or master's students or Audiology (AUDD) majors only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 4576 (3) Communication Neuroscience

Provides an introduction to neuroscience with an emphasis on the systems that support human communication including speech perception and production, language, memory and cognition. Topics areas will include auditory processing, language, memory and motor systems. Development of brain systems and structures will be explored, as well as neurologically based disorders. Neuroscientific methods surveyed will include MRI, fMRI, EEG, MEG, NIRS, lesion studies and electrophysiology.

Requisites: Requires a prerequisite course of SLHS 2010 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

SLHS 4704 (3) Audiological Evaluation

Studies basic principles and techniques of hearing evaluation, including pure-tone, speech, immittance, and advanced audiometry; hearing conservation in hospital, school, and industrial settings; and identification and evaluation of auditory pathologies. Required projects in screening and pure-tone audiometry.

Requisites: Requires a prerequisite course of SLHS 3106 (minimum grade C-).

Additional Information: Departmental Category: Didactic: Audiology

SLHS 4714 (3) Audiological Rehabilitation

Covers basic principles and techniques related to the habilitation and rehabilitation of individuals who are deaf or hard of hearing: amplification, speech, language, auditory, speech reading, and educational issues.

Requisites: Requires prerequisite courses of LING 3100 or SLHS 3006. Requires a prerequisite or corequisite course of SLHS 4704 (all minimum grade C-).

Additional Information: Departmental Category: Didactic: Audiology

SLHS 4849 (1-6) Independent Study for Undergraduates

Instructor consent required.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Independent Study

SLHS 4918 (2) Introduction to Clinical Practice

Introduces students to the clinical processes and key components of assessment and interventions. Explores the applications of the theoretical and scientific information to clinical settings. Students complete supervised observation of individuals with communication challenges.

Requisites: Requires a prerequisite course of SLHS 2000 (minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Speech, Language and Hearing Sciences (SLHS) majors only.

Additional Information: Departmental Category: Practica

SLHS 4938 (1-6) Internship: Speech-Language Intervention

Provides a supervised clinical experience with children who have communication challenges enrolled in the Child Learning Center programs; individuals demonstrating communication disorders as a cotherapist in the Speech, Language, and Hearing Center; or off-campus experience in an affiliated hospital or public school program. Instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5002 (2) Evidence-based Practice and Research Methods 1

Provides opportunities for students to acquire the knowledge of evidence-based practice (EBP) in the areas of speech, language and hearing sciences (SLHS). Covers topics about EBP in SLHS, levels of evidence and strategies for using scientific evidence in the process of making clinical decisions.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5012 (2) Evidence-based Practice and Research Methods 2

Focuses on the knowledge of research methods and the application of research principles into clinical practice. In particular, covers quantitative research methods that are in speech-language pathology clinical settings. Will cover (1) clinical practice and research methods in speech, language and hearing sciences; (2) single-subject designs in clinical settings; (3) introduction to data collection, data organization and data analysis; (4) interpretation and presentation of clinical data. Formerly SLHS 5000.

Repeatable: Repeatable for up to 4.00 total credit hours. Allows multiple enrollment in term.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5032 (3) Competencies and Strategies for the SLPA

Includes roles and responsibilities for the Speech Language Pathology Assistant (SLPA) working in the public schools, service delivery models, health and safety, screening assistive technology, intervention and self reflection and evaluation. Must be accepted in the SLPA certification program.

Requisites: Requires a prerequisite course of SLHS 4918 (minimum grade D-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5112 (2) Clinical Practice I

Provides entering graduate students a framework for beginning their clinical education and building the relationship of theory and research to current clinical practice in speech-language pathology. Key topics for exploration include contemporary professional issues, licensure, professionalism, ethics and ethical conduct, scope of practice, competency development, teaming and collaboration, accountability and multicultural issues. Formerly SLHS 5110.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5122 (1) Clinical Practice II: Assessment and Treatment Planning

Explores critical elements associated with assessment and treatment planning in speech-language pathology. Topic areas include assessment style, interviewing, test selection and techniques of test administration. Diagnosis and treatment planning section includes differential diagnoses, ethics of diagnoses, goal writing and treatment rationale.

Requisites: Requires a prerequisite course of SLHS 5112 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5132 (1) Clinical Practice III: School Based Skills

Targeted skills for implementation in educationally-based settings for speech-language pathologists. Specific coursework will address writing IEPs/IFSPs, expanded work with service delivery models and implementation of state and federal requirements for school based services.

Requisites: Requires a prerequisite course of SLHS 5122 (minimum grade B-).

SLHS 5242 (3) Language Disorders in School Age Children

Addresses the nature, assessment, and treatment of developmental language disorders in school age children.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5252 (3) Acquired Language Disorders in Adults

Introduces the neural bases and medical etiologies of acquired language disorders in adults, explores the ways in which normal language processing may become disordered, and studies current methods of evaluation and treatment design.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5262 (3) Dysphagia

Provides students with background in the anatomical, physiological, and neurological bases of swallowing function and disorders across the lifespan. Etiological factors are presented, as well as various assessment tools and principles of treatment of swallowing disorders in children and adults.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5272 (1) Augmentative Alternative Communication: Theory and Use

Provides an overview of the application of current technology to alternative/augmentative communication. Emphasizes assessment and intervention with nonverbal children and adults with need for alternative/augmentative communication systems. Presents various technological devices and systems. Addresses system selection, programming, development and integration of use in environmental contexts.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5282 (3) Acquired Cognitive Disorders

Explores the theoretical and clinical management of acquired cognitive disorders that impact communication. Includes basic functional neuroanatomy.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5292 (3) Neurogenic Speech Disorders in Adults

Presents the neural bases of normal and disordered speech motor control, teaches assessment and treatment of motor speech disorders in adults, and applies motor control research to clinical problems.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5302 (3) Articulation and Phonological Disorders

Provides overview of phonological development, perception, and production. Presents factors related to articulation and focuses on critical evaluation of traditional and phonological based assessment and intervention procedures. Includes coverage of phonological awareness, metaphonological skills as related to literacy, as well as treatments and principles specific to children with motor speech disorders.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5312 (2) Aging and Communication

Examines normal age-related changes to communication systems. Anatomic and physiological changes to the mechanisms of speech production, audition and the brain will be included, with a focus on the functional impacts of such changes for speech production and perception, cognition, language and social communication.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

SLHS 5332 (3) Voice Disorders

Examines the anatomical and physiological bases for normal and disordered laryngeal function. Explores structural, neuropathologic, functional/behavior and idiopathic voice disorders. Emphasis on assessment and treatment of individuals with voice disorders, including special populations.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5362 (3) Fluency Disorders

Exploration of the nature, differential diagnosis and treatment of fluency disorders across the life-span. Students will develop the requisite skills and knowledge base to provide prevention, consultation, assessment and intervention for fluency disorders. Research bearing on affective, behavioral and cognitive components of stuttering will be reviewed, along with recent data on the neural bases of the disorder. A broad range of treatment approaches will be discussed and demonstrated.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5555 (2) Advanced Topics in Social Communication: Autism Spectrum Disorders

Students will acquire knowledge and skills in the appropriate selection, application and evaluation of interventions for children, adolescents and adults with autism spectrum disorders (ASD) and their families. Evaluation and diagnosis, including development of the IFSP and IEP, will be addressed.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5576 (3) Neuroanatomy and Neurophysiology of Communication

Provides an introduction to the neuroanatomy and neurophysiology that collectively give rise to human communication including speech perception and production. We will consider how speech, language and hearing are represented in and controlled by the central nervous system and how neuropathologies affect processes of communication.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 5602 (3) Communication Challenges in Children: Birth to Six

Emphasizes nature and profile of language and communication disorders affecting infants and young children. Facilitates integration of clinical and theoretical perspectives with specific approaches for family-centered assessment and intervention principles, models and techniques.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5612 (1) Language Learning Disabilities

Focuses on the nature, assessment and treatment of learning disabilities and the role of the speech-language pathologist in working with children, adolescents and adults with LLD.

Requisites: Requires a prerequisite course of SLHS 5242 (minimum grade D-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5674 (3) Signals and Systems in Audiology

Provides in-depth study of instrumentation used by audiologists for hearing aid evaluation and fitting, signal generation and modification, and signal measurement and calibration.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 5848 (1-4) Independent Study

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Practica

SLHS 5849 (1-4) Independent Study 1, M.A.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 5859 (1-4) Independent Study 2, M.A.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 5878 (1-3) Practicum 1: Speech-Language-Learning Appraisal

Provides a supervised clinical experience on campus in appraisal of speech, language, and learning disorders after training at the observational level.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5898 (1-4) Practicum 1: Speech-Language-Learning Intervention

Offers on-campus and off-campus supervised clinical practice in management of speech-language-hearing disorders in children and adults.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5918 (1-3) Audiology Clinical Practicum: Lab

Provides clinical training in the on site Speech, Language and Hearing Center in skills including audiology identification, evaluation and management for adults and children with hearing loss.

Repeatable: Repeatable for up to 16.00 total credit hours.

Requisites: Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5928 (1-4) Audiology Clinical Practicum: Level 1

Provides clinical training in an off-campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Requires a prerequisite course of SLHS 5918 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

SLHS 5930 (4) Speech Language Pathology Assistant Internship

Placement for a minimum of 12 hours per week for a total of 180 hours including 100 direct student contact hours under the supervision of a fully credentialed SLP, to fully develop requisite skills as an SLPA and become employed in a public school setting. Must be accepted into the SLPA certificate program.

Requisites: Requires a prerequisite course of SLHS 4918 (minimum grade D-).

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 5938 (1-4) Audiology Clinic Practicum: Level 2 Educational

Provides clinical training in an off campus educational audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Practica

SLHS 5948 (1-4) Audiology Clinic Practicum: Level 2 Medical

Provides clinical training in an off campus medical audiology facility in identification, evaluation and management for adults and children with hearing loss. Schedule is variable with a minimum requirement of 16 hours on rotation per week.

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of SLHS 5918 and SLHS 6544 and SLHS 6614 (all minimum grade B). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6000 (1-4) Problems in Speech, Language and Hearing Sciences

Studies selected topics related to the theory and management of communication disorders, and theoretical/scientific information related to speech, language, and hearing.

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6006 (3) Advanced Hearing Science

Provides advanced study in hearing science, including physical, physiological, and psychological acoustics of both normal and impaired auditory systems. Department enforced prerequisite: graduate standing in SLHS; undergraduate course work in biology or anatomy.

Additional Information: Departmental Category: Didactic: Speech-Hearing Science

SLHS 6402 (3) Issues and Methods in Cognitive Science

Interdisciplinary introduction to cognitive science, examining ideas from cognitive psychology, philosophy, education, and linguistics via computational modeling and psychological experimentation. Includes philosophy of mind; learning; categorization; vision and mental imagery; consciousness; problem solving; decision making, and game-theory; language processing; connectionism. No background in Computer Science will be presumed.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6402 and EDUC 6504 and LING 6200 and PHIL 6310 and PSYC 6200

Requisites: Restricted to graduate students only.

SLHS 6504 (1) Professional Ethics in Audiology

Overview of ethics and ethical issues in the profession of audiology. Topics to be discussed include code of ethics by professions, approaches to analyzing ethical dilemmas, ethics in relationships with manufacturers, and ethical considerations in teaching, clinical practice and research.

Requisites: Restricted to graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6514 (1) Professional Issues in Audiology

Overview of professional issues related to the profession of audiology. Topics to be discussed include certification, licensure, professional associations, infection control, practice management, federal regulations related to audiology, professional communications and professional relationships.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6544 (3) Auditory Processes: Adult Assessment

Advanced study on the current science surrounding hearing assessment of adults across the age span. Includes theoretical foundations and clinical applications.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6554 (3) Auditory Processes: Child Assessment

Provides advanced study in hearing assessment and management of children across the age span. Topics include epidemiological, medical, audiological, developmental, and rehabilitative aspects of normal and impaired hearing in children.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite undergraduate background in SLHS.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6564 (3) Auditory Processes: Neurodiagnostics

Provides advanced study in the neural bases of hearing. Includes theoretical foundations and clinical assessment of neurological functioning in auditory systems with both normal and impaired function.

Requisites: Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6614 (3) Fundamentals of Amplification

Discusses theoretical and clinical issues regarding the design, fitting, and evaluation of amplification technology for individuals with hearing loss. Includes the use of behavioral, psychological, electroacoustic, and physiological (real ear) measures in the selection and evaluation of digital and analog hearing aid technology.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6642 (3) Development and Intervention in Childhood Hearing Loss

Reviews development and intervention with children who are deaf and hard-of-hearing, birth through school age. Focuses on speech, auditory training, language, literacy and cognitive development. Formerly SLHS 6640.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: Speech-Language Pathology

SLHS 6650 (2) Counseling and Professional Ethics

Explores counseling theories and techniques following the diagnosis of a disability across the life span. Considers issues related to grieving and mourning, parenting, disability, cultural customs, attachment, and relationships. Covers professional ethics and ethical responsibilities.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6660 (1) Multicultural Issues in SLHS and Communication Theory

Provides an in-depth understanding and first-hand knowledge of different racial, ethnic and religious communities, which is necessary to develop and refine multicultural clinical competence. Incorporates scholarly readings and experiential learning in multicultural settings and fosters participants' qualitative research skills.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6670 (3) Adult Aural Rehabilitation

Provides an investigation of the impact of hearing loss on adults. Psycho-social aspects, communication challenges, assessment and intervention for adult hearing disorders including presbycusis, tinnitus, vestibular disorders, auditory central processing disorders and sudden hearing loss.

Requisites: Requires a prerequisite course of SLHS 6544 (minimum grade B-). Restricted to graduate students only.

Recommended: Prerequisites SLHS 7418 and SLHS 7540.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6918 (7) Practicum 2: Speech-Language-Learning Internship

Gives an off-campus experience in a clinical or hospital setting that provides in-depth practice in management of communication disorders of children and adults.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 6928 (1-7) Practicum 2: Public School Internship

Provides an off-campus supervised experience providing extended and in-depth practice involving school-age children in a school classroom.

Repeatable: Repeatable for up to 10.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 6938 (1-10) Audiology Clinic Externship Educational

Provides students with full time off campus experience in an educational audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

Repeatable: Repeatable for up to 21.00 total credit hours.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 6940 (1) Candidate for Degree

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Didactic: All-Department

SLHS 6948 (1-10) Audiology Clinic Externship: Medical

Provides students with full time off campus experience in a medical audiology facility offering in-depth and advanced procedures for identification, evaluation and management of hearing loss in adults and children.

Repeatable: Repeatable for up to 21.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Didactic: Audiology

SLHS 6950 (1-7) Master's Thesis

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7000 (3) Research Designs in Human Communication Sciences and Disorders

Offers an advanced seminar in research designs for human behavior: efficacy, ethnographic, single-subject, quasi-experimental, and experimental designs. Designed to familiarize students with terminologies and research designs frequently used in speech-language-hearing areas.

Recommended: Prerequisite basic statistics.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7200 (3) Business, Management and Ethics in Audiology

Focuses on the business aspects of managing an audiology practice. Addresses developing a business plan, contracting for services, legal issues, financial reporting, budgeting, pricing, billing and reimbursement, regulatory issues, marketing, personnel management, risk abatement, and business ethics.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7418 (2) Cognitive Science Research Practicum

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint PhD in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7412 and EDUC 6506 and LING 7415 and PHIL 7415 and PSYC 7415

Requisites: Restricted to graduate students only.

Recommended: Prerequisite EDUC 6505.

SLHS 7428 (2) Cognitive Science Research Practicum 2

Independent, interdisciplinary research project in cognitive science for advanced graduate students pursuing a joint Ph.D in an approved core discipline and cognitive science. Research projects integrate at least two areas within the cognitive sciences: psychology, computer science, linguistics, education, philosophy. Students need commitments from two mentors for their project.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7422 and EDUC 6516 and LING 7425 and PHIL 7425 and PSYC 7425

Requisites: Restricted to graduate students only.

SLHS 7450 (3) Audiology Capstone Project

Provides an individualized project for AUD, completed prior to initiation of final clinical year. May be in the form of research-based investigation, an evidence-based position paper, a clinical protocol based on peer-reviewed literature, a grant proposal, or another format approved by AUD committee. Project requires approved proposal by AUD committee and focused study supervised by capstone advisor.

Requisites: Restricted to Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7520 (3) Auditory Processes: Medical and Genetic Bases

Discusses current developments in epidemiology, pathogenesis, and symptomatology of hearing loss. Investigates the genetic bases of hearing loss and deafness. Incorporates clinical decision theory in assessment and intervention. Explores cross-disciplinary topics from genetics, radiology, pharmacology, pathology, and otology.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7530 (3) Auditory Processes: Theory and Application in the School Environment

Focuses on application of routine audiological practices such as screening, assessment, rehabilitation, and instrumentation to children in educational settings. Emphasizes federal education regulations and pertinent case law.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7540 (3) Auditory Processes: Physiology, Assessment, and Management of the Vestibular System

Emphasizes current research on physiology of the vestibular system, including both structure and function. Considers the etiology of both peripheral and central pathologies of the vestibular system. Discusses ways to assess function of the vestibular system as well as theoretical and practical considerations of vestibular rehabilitation.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7550 (2) Mgmt and Prev of Noise and Noise Induced Hearing Loss

Discusses effects of noise and other damaging agents on the physiology of the auditory system. Highlights principles of hearing conversation programs. Focuses on prevention, identification, and management of occupational hearing loss and current legislation as it pertains to occupational safety and hazards.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7554 (1) Audiometric Instrumentation and Calibration

Introduces students to the basic concepts of electroacoustic transduction, and demonstrates the application of these concepts to the measurement and calibration of audiometric instrumentation. Students will become familiar with standard measurement equipment including multimeters, oscilloscopes, and sound level meters; and will become familiar with calibration standards for instruments including the audiometer, tympanometer, and electrophysiological amplifiers.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7614 (3) Implantable Devices: Technology and Clinical Application

Examines technological aspects and clinical applications of implantable prostheses such as cochlear implants, brainstem implants, hybrid cochlear implants, Baha devices and middle ear implants. Topics will include: history of implantable devices, anatomy and histopathology of the inner ear, speech processing in implants, mapping devices, candidacy criteria, behavioral and electrophysiologic techniques for assessment and outcomes in implanted children and adults.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Recommended: Prerequisite good standing in the SLHS graduate program or instructor consent will be required.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7640 (3) Communication Processes and Hearing Loss: Birth through Six

Provides in-depth study of current research literature and its implications for clinical practice regarding development of communication processes in the first six years of life and impact of hearing loss. Investigates development of language, auditory perception, speech production, social-emotional abilities, and cognition.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7714 (3) Advanced Topics in Amplification

Discusses advanced issues in the design and fitting of hearing aid technology, including advanced signal processing, outcomes assessment, evidence-based practice and specialized fitting protocols for pediatric and geriatric populations. Current research is integrated with clinical case studies to guide the development of evidence-based practice in hearing aid fittings.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: Audiology

SLHS 7775 (1) Topics in Cognitive Science

Reading of interdisciplinary innovative theories and methodologies of cognitive science. Students participate in the ICS Distinguished Speakers series that hosts internationally recognized cognitive scientists who share and discuss their current research. Session discussions include analysis of leading edge and controversial new approaches in cognitive science.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 7772 and EDUC 7775 and LING 7775 and PHIL 7810 and PSYC 7775

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

SLHS 7849 (1-4) Independent Study 1, PhD

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 7859 (1-4) Independent Study 2, PhD

Repeatable: Repeatable for up to 7.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Independent Study

SLHS 7918 (3) Practicum 3: Clinical Supervision

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 8918 (3) Practicum 3: Classroom Instruction

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 8928 (3) Practicum 3: Research Coordination

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Practica

SLHS 8990 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to Speech, Language and Hearing Sciences (SLHS) or Audiology (AUDD) graduate students only.

Additional Information: Departmental Category: Didactic: All-Department

Sustainability and Social Innovation RAP (SSIR)

Courses

SSIR 1010 (3) Social Entrepreneurship & Sustainability

Engages students in understanding, through critical thinking, problem solving, and collaborative projects, how different change models, including social entrepreneurship, can lead to sustainable outcomes. Based on a combination of lectures, exams, group work, exercises, readings, in-class discussion and analysis, and speakers, students develop skills to work collaboratively on a problem-oriented topic and present project to public audience at semester end.

Requisites: Restricted to Sustainability by Design Residential Academic Program (PSBD) or Sustainability and Social Innovation Residential Academic Program (PSEE) students only.

Additional Information: Arts Sci Core Curr: Ideals and Values

Swedish (SWED)

Courses

SWED 1010 (4) Beginning Swedish 1

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1020 (4) Beginning Swedish 2

Department enforced prerequisite: SWED 1010 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SWED 1120

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1110 (4) Beginning Swedish 1 - Directed Independent Language Study

Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society.

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1120 (4) Beginning Swedish 2 - DILS

Continuation of SWED 1110 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1110 (minimum grade C-).

Equivalent - Duplicate Degree Credit Not Granted: SWED 1020

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 1900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Swedish

SWED 2010 (4) Intermediate Swedish 1 -DILS

Continuation of SWED 1120 DILS. Provides practical, communicative language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Introduces students to Swedish history and contemporary culture and society. Department enforced prerequisite: SWED 1120 (minimum grade C-).

Additional Information: Arts Sci Core Curr: Foreign Language
Departmental Category: Swedish

SWED 2020 (4) Intermediate Swedish 2 - DILS

Develops intermediate reading, writing, speaking and verbal comprehension skills. Uses the Directed Independent Language Study (DILS) model that combines in-class exercises and lectures with independent study. Reviews and continues content of SWED 2010. Directed independent language study course requires work outside of class. Department enforced prerequisite: SWED 2010 (minimum grade C-).

Additional Information: Departmental Category: Swedish

SWED 3010 (3) Advanced Swedish 1-DILS

Continuation of Intermediate Swedish 2. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 2020 - DILS (minimum grade C-).

Additional Information: Departmental Category: Swedish

SWED 3020 (3) Advanced Swedish 2 - DILS

Continuation of Advanced Swedish 1. Provides advanced language skills for use in a variety of situations. Examines basic language structure and grammatical forms. Exposes students to historical and modern Swedish culture and society. Directed independent language study course, requires work outside of class. Department enforced prerequisite: SWED 3010 - DILS (minimum grade C-).

Additional Information: Departmental Category: Swedish

SWED 3900 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Swedish

Telecommunications (TLEN)

Courses

TLEN 5010 (3) Network Economics and Finance I

Introduces students to the fundamental theoretical framework and tools used by economists to examine decision making under scarcity. Reviews mathematical economics and models. Examines consumer choice and firm supply. These two aspects of the market are brought together to examine how price and output are determined in competitive and imperfectly competitive markets. Introduces financial economics, network effects and public goods.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5050 (3) Leading Oneself

Provides working engineers a background in leadership concepts and methods and enables students to develop practical leadership skills through numerous in-class exercises and experimentation based assignments. Topics include authentic leadership, motivating self and others, cultivating emotional intelligence, personal mastery, creating accountability, conflict resolution, leading change and organizational culture. Required for all Engineering Management degree students.

Equivalent - Duplicate Degree Credit Not Granted: EMEN 5050

Requisites: Restricted to Leeds School of Business or College of Engineering graduate students only.

TLEN 5106 (3) International Deployment of Broadband Networks

Evaluates the business potential for deploying fixed or mobile broadcast networks in an international context. Guides students to develop financial statements to evaluate the investment potential of the venture. Covers: strategy, market potential, sales channels, costs, regulatory and financial issues all in an international context. Project teams mimic the matrix structure of working teams in business context and present to an investor their recommendations.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5130 (3) Telecommunications Business Strategy

Covers concepts, strategies, and practical implementation of market oriented business strategy in the telecom industry grounded with real world examples. Topics include positioning, segmentation/ targeting, technology adoption, advertising/outreach, communication strategies, product management, sales process and business intelligence.

Requisites: Requires prerequisite course of TLEN 5010 (minimum grade D-). Restricted to graduate students only.

TLEN 5150 (1) Managing Effectively in a Changing Telecommunications Environment

Provides students with an opportunity to join international managers and policy makers from around the world in an intensive seminar focused on the challenges of managing in a telecommunications environment in an era of technological change. Guest lecturers provide an effective overview of the cutting-edge issues managers face in telecom and technology companies around the world.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5150

TLEN 5190 (3) Standardization and Standards Wars

Examines current issues and strategy in the standardization of telecommunications and information technologies. Covers topics on the importance of standards, government and private sector perspectives, and impact of information age technologies on standards development. Introduces students to relevance of antitrust and intellectual property law to the topic.

TLEN 5210 (3) Principles of Telecommunications Policy

Learn the key issues and principles that guide the decisions of policy makers with respect to the regulatory treatment of voice, video and data communications. Engage in critical debate, and develop instincts for anticipating the likely regulatory models that may be applied to new technologies. This introductory course covers technical, economic, legal, political and institutional considerations.

Requisites: Requires prerequisite course of TLEN 5010 (minimum grade D-).

TLEN 5230 (3) Spectrum Management and Policy

Studies how spectrum policy is developed and implemented. A general framework is developed for understanding telecommunications law and regulatory objectives. Specifically analyzes international and domestic dimensions of spectrum policy. Considers how economics, administrative processes and innovative technologies affects management of the spectrum.

TLEN 5240 (3) Telecommunications Law and Policy

Examines laws governing telecommunications industries, including federal and state regulation and international aspects. Includes telephone, cable, satellite, cellular and other wireless systems and the Internet.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7241

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5245 (3) Introduction to Intellectual Property Law

Provides an overview of our nation's intellectual property laws, including patent, copyright, trademark, trade secret and also discusses other assorted matters related to intellectual property, including licensing, competition policy issues and remedies.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 6301

TLEN 5250 (2-4) Technology Law and Policy Clinic

Features technology law advocacy before administrative, legislative and judicial bodies in the public interest.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7809

Grading Basis: Letter Grade

TLEN 5265 (3) Copyright

Examines state and federal laws relating to the protection of works of authorship ranging from traditional works to computer programs. Studies the 1976 Copyright Act as well as relevant earlier acts. Gives attention to state laws, such as interference with contractual relations, the right of publicity, moral right, protection of ideas and misappropriation of trade values, that supplement federal copyright.

Equivalent - Duplicate Degree Credit Not Granted: LAWS 7301

Requisites: Restricted to graduate students only.

TLEN 5300 (1-3) Telecommunications Theory and Applications

Examines the mathematical and physical theory of telecommunications. Deals with the fundamental concepts related to a wide range of topics including physical units, numbering systems, trigonometric functions, logarithms, indices, decibels, complex numbers, calculus, elementary probability, and power circuit analysis.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5310 (3) Telecommunications Systems

Reviews fundamental technical concepts and terminology in telecommunications. Topics of focus include: decibels, noise analysis, transmission lines, electronic signals, radio spectrum characteristics, link budgets, AM modulation, angle modulation, digital modulation, multiplexing, sampling and digital encoding, detection, and similar physical layer concepts. Systems for analysis include CATV, cellular wireless, WLAN, satellite systems, internet networking and related voice and data networks.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5330 (3) Data Communications 1

Provides a comprehensive technical survey of data and computer communications including Wireless, LAN, MAN, and WAN systems and standards. Covers packet switching, internetworking, addressing, routing, transport layers, TCP/IP internet, wired and wireless LAN technologies, congestion control and flow control schemes.

Requisites: Restricted to ITP (TLEN-MS) students only.

TLEN 5340 (3) VOIP Network Design

Focuses on VoIP network design and optimization. The emphasis is on the convergence of VoIP, PSTN and cell phone networks and signaling. Topics include voice processing as well as IP and SS7 signaling. In addition there will be a review of ISDN, DSL, Sonet, ATM, SIP and MPLS. There will be a case problem for sizing a VoIP network using silence suppression.

Requisites: Requires corequisite course of TLEN 5310. Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5350 (3) Commercial Spaceflight Operations and Communications

Aimed at a high level fundamental understanding of broadcasting, communication and navigation satellite systems. Topics include orbital mechanics, orbit selection, spacecraft subsystems, spacecraft and earth station configurations, propagation issues, link budgets, modulation and multiplexing techniques, multiple access schemes (FDMA, TDMA, CDMA), error control coding, satellite network architecture, and economic, regulatory and business issues in Geo, Meo, and Leo systems.

Requisites: Requires corequisite course of TLEN 5330. Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5370 (3) IP Routing Protocols

Breaks IP routing technologies into two fundamental pieces: an in-depth study of interior and then exterior gateway protocols. Department consent is required.

Requisites: Requires prerequisite course of TLEN 5330 (minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5380 (3) Future of Video: Technology, Policy, and Economics

Examines the issues that have been created by the shift from analog to digital technologies, the shift from narrowband/wideband systems to broadband systems, and the shift to converged networks (i.e. networks able to convey voice, data, image and video traffic on a common platform) based upon packet switching and Internet Protocol (IP) suite.

Equivalent - Duplicate Degree Credit Not Granted: ATLS 5380

Requisites: Requires prerequisite courses of TLEN 5210 (minimum grade D-). Restricted to graduate students only.

TLEN 5410 (3) Network Management and Operations

Offers students a hands-on experience programatically managing network hardware and essential network services such as DHCP, DNS, ARP, FTP, Telnet, HTTP, SSH, SMTP, TFTP, and SNMP through the use of cross-platform scripting. Students with little or no programming experience will learn scripting by replicating functionality provided in common management suites such as HP OpenView, Nagios, Zennos, IBM Netview and others. Department consent required.

Requisites: Restricted to graduate students only.

TLEN 5430 (3) Data Communications 2

Provides a detailed technical study of Internet and Internet-related protocols following a top-down approach through the protocol stack. Bit-level analysis of a large number of Internet and Internet-related protocols, including the study of classic protocol suite principles. Covers real time and near real-time data streaming, IP mobility, IPV6, and an introduction to Internet security.

Requisites: Requires prerequisite course of TLEN 5330 (minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5438 (3) Internet Lab

Have you ever wondered how the Internet actually works? This course teaches students simple, hands-on understanding of the technical components and challenges of providing Internet Services to everyday users. This is the ideal course for technical or non-technical students who have a passion for the Internet or need to have a more detailed understanding of the Internet within their career.

Grading Basis: Letter Grade

TLEN 5460 (3) Telecommunication Systems Laboratory

Provides direct experience with telecommunications functions and equipment through experiments and demonstrations. Student teams learn the fundamental techniques of signal transmission and impairment measurement, voice and data switching, and systems administration, and the fundamental functions of data networking and services. Each experiment is designed to focus on some particular aspect of system management, development, or maintenance for either enterprise telecommunications customers or telecommunication service providers. Procedures require the use of actual commercial equipment, services, observation, reporting of behavior, and performance, compared to specified requirements. Student teams and laboratory periods for the semester are established during the first class lecture meeting. Department consent required.

Requisites: Requires prerequisite courses of TLEN 5310 and TLEN 5330 (all minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5462 (3) Datacenter Networks

Presents advanced networking techniques through experiments with network measurement equipment, switches, routers, and management interfaces. Each experiment focuses on some particular aspect of system management, development, or maintenance. Procedures require the use of actual commercial equipment, services, observation, reporting of behavior, and performance, compared to specified requirements.

Requisites: Requires prerequisite course of TLEN 5460 (minimum grade D-). Restricted to graduate students only.

TLEN 5490 (3) Network Programming

Exposes students to Unix/Linux systems and network programming with an emphasis on practical programming problems and experience. Covers the unique challenges of programming distributed systems including resolving synchronization, threads, pipes, sockets, and other constructs for building TCP/IP network servers and clients.

TLEN 5510 (3) Wireless and Cellular Communications

Presents in detail the technologies and architectures employed in cellular and other modern wireless systems and discusses regulatory and other industry issues. Major topics include radio technology, multiple access techniques, analog and digital cellular telephony, and personal communications systems.

Requisites: Requires prerequisite course of TLEN 5310 (minimum grade D-). Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5520 (3) Wireless Local Area Networks

Examines small-scale wireless networks particularly personal and local area networks. Covers licensed and unlicensed spectrum, indoor and small-scale radio propagation, modulation techniques, network topologies, ad hoc and infrastructure networks, protocol design, TCP/IP-wireless interactions and protocol standards.

Equivalent - Duplicate Degree Credit Not Granted: ECEN 5122

Requisites: Requires prerequisite course of ECEN 3810 or APPM 3570 or MATH 4510 (minimum grade D-).

Recommended: Prerequisite TLEN 5430.

TLEN 5530 (3) Applied Network Security

Examines the critical aspects of network security. a technical discussion of threats, vulnerabilities, detection, and prevention is presented. Issues addressed are cryptography, firewalls, network protocols, intrusion detection, security architecture, security policy, forensic investigation, privacy, and the law.

Requisites: Restricted to graduate students only.

TLEN 5540 (3) Network Security Laboratory

Applies what students have learned in computer and network security foundations in a simulated network environment. Topics to be covered include: system hardening, firewalls, intrusion detection, vulnerability assessment, and investigation.

Recommended: Prerequisite TLEN 5530 and operating system experience.

TLEN 5550 (3) Computer and Network Security

Studies methods to protect information, and the ability to process and move information, from theft, misuse, tampering, destruction and unauthorized access. Introduces foundational topics of computer and network security, including security models, cryptography and authentication protocols.

Equivalent - Duplicate Degree Credit Not Granted: CSCI 6268

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CSCI 5273 and significant experience in coding (C or C++) and some experience in networks and familiarity with TCP/IP, UDP and ICMP.

TLEN 5560 (3) Wireless Systems Laboratory

Serves as hands-on exploration of wireless communication systems. Designed to complement TLEN 5510 and TLEN 5520 by taking several subjects to greater depth. Students will work with, and in some cases build, radio frequency test equipment, transmitters, receivers, antennas and wireless communication systems.

Requisites: Requires prerequisite course of TLEN 5310 (minimum grade D-). Restricted to graduate students only.

Recommended: Corequisite TLEN 5510 or TLEN 5520.

TLEN 5570 (3) IP Network Design

Implement fundamentals of IP Routing Protocols and apply them directly to design based networking problems. Design scenarios will incorporate physical and logical design, financial analysis, and laboratory configuration.

Requisites: Requires prerequisite course of TLEN 5370 (minimum grade D-). Restricted to graduate students only.

TLEN 5600 (1) Telecommunications Seminar

Provides a series of weekly lectures with questions and discussion. Many of the speakers are nationally known experts in telecommunications.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5700 (2) Research Methods

Develop basic concepts and methods for pursuing quantitative and qualitative research. Students will develop a research proposal that will be completed in TLEN 5710 or as a Master's Thesis. Writing skills test required.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5710 (1-3) Capstone

Complete Capstone research project initiated in TLEN 5700.

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Requires prerequisite course of TLEN 5700 (minimum grade D-). Restricted to graduate students only.

TLEN 5830 (1-6) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

TLEN 5831 (3) Special Topics

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

TLEN 5832 (1-4) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

TLEN 5833 (2-3) Special Topics

Repeatable: Repeatable for up to 3.00 total credit hours.

TLEN 5834 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

TLEN 5835 (2-3) Special Topics

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 5836 (1-3) Special Topics

Repeatable: Repeatable for up to 15.00 total credit hours. Allows multiple enrollment in term.

TLEN 5840 (3) Voice Over IP Lab: Voice Network Design and Implementation

Provides an in-depth immersion into the foundational theories and technologies of Voice Over IP (VoIP), and direct experience with real-world, hands-on lab experiments and demonstrations. In this class students will learn the fundamentals of voice technologies, services and tools used in industry to design, deploy and troubleshoot VoIP networks.

Grading Basis: Letter Grade

TLEN 5841 (3) Secure Web Application Development

Learn to develop and protect secure applications for web and mobile. Students will develop in a production cloud environment mirroring industry trends. Techniques to resist attackers and increase situational awareness will be covered. The class culminates with an end of semester project applying secure coding techniques to build a secure web application from start to finish.

Grading Basis: Letter Grade

TLEN 5842 (3) Linux Systems Administration

Learn to configure, maintain and deploy Linux operating systems and services. The backbone of the Internet is made up of Linux systems running web server, databases, DNS, backup and more. The class will prepare students to deploy services and code in a Linux environment.

Requisites: Restricted to Telecommunications (TLEN) graduate students only.

Grading Basis: Letter Grade

TLEN 5920 (1-6) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 87-180 credits (Senior) or graduate students in the College of Engineering or Leeds School of Business only.

TLEN 6940 (1) Candidate for Degree

Requisites: Restricted to Leeds School of Business or College of Engineering graduate students only.

Grading Basis: Pass/Fail

TLEN 6950 (1-6) Master's Thesis

Requisites: Restricted to Leeds School of Business or College of Engineering graduate students only.

TLEN 7000 (1-6) Current Topics in Telecommunications

Studies research topics of current interest in telecommunication and networking.

Repeatable: Repeatable for up to 8.00 total credit hours.

Requisites: Restricted to graduate students only.

TLEN 7001 (3) Interdisciplinary Telecom Analysis

Examines a set of problems, research methodologies and analytical techniques that are common to the research, problem solving and analysis of information and communications technology development and deployment issues. Looks critically at the strengths, limitations and underlying assumptions of key research and analysis approaches that relate business, economic and policy objectives to current and future telecommunications development and deployment efforts.

Grading Basis: Letter Grade

TLEN 8990 (1-10) Doctoral Dissertation

Investigates specialized topic or field in the area of telecommunications. Approved and supervised by faculty members.

Requisites: Restricted to graduate students only.

Theatre (THTR)

Courses

THTR 1003 (3) Acting 1: Introduction to Acting

Introductory course designed to explore creativity, collaboration and communication in the craft of acting. Focuses on basic terms and concepts of psychological realism fundamental to the actors' process through solo work and ensemble exercises. Open to majors and non-majors.

Additional Information: Departmental Category: Performance

THTR 1009 (3) Theatre and Society

Explores the importance of telling (and listening) to stories from the stages of the world; in theatre we learn what people value in their time and place. Investigates the range of genres of theatre in today's society and how theatrical artwork is devised and presented. Ideal for non-majors.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: Special Courses in Theatre

THTR 1011 (3) Global Theatre 1: Live Performance to Shakespeare

Travels across four continents exploring live performance from the beginning of recorded history to Shakespeare through various forms of theatrical storytelling including masked dramas, shadow puppets, kabuki, passion plays and commedia.

Additional Information: GT Pathways: GT-AH1 - Arts Hum: Arts Expression
Arts Sci Core Curr: Literature and the Arts
Departmental Category: History/Dramaturgy/Directing

THTR 1019 (3) Script Laboratory: Text Analysis and Practice for the Theatre

Introduces fundamental methods of text analysis for performance. Equips theatre makers with common vocabulary and concepts to more effectively communicate when collaborating with other artists. Provides tools for analyzing any narrative art form.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) Theatre (THTR or TBFA) majors only (excluding minors).
Additional Information: Departmental Category: Special Courses in Theatre

THTR 1105 (3) Stage Technologies

Introduces technical production elements and procedures, including materials, organizations, methods and equipment to realize theatrical scenery, properties, lighting and sound.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 1115 (3) Costume Technologies

Introduces technical production elements and procedures including materials, organizations, methods and equipment to realize theatrical costuming and make-up.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.
Additional Information: Departmental Category: Theatre Design and Technology

THTR 2003 (3) Acting 1

Emphasizes principles of acting, focusing on exercises in relaxation, talking and listening, actions and objectives, and basic concepts of process work.

Requisites: Restricted to Theatre (THTR or TBFA) majors only (excluding minors).
Additional Information: Departmental Category: Performance

THTR 2021 (3) Global Theatre 2: Forms of Modern Theatre and Drama

Explores the dramatic literature, performance traditions and cultural contexts in world theatre from 1600s to the present, through discussion, writing and theatre practice, with an emphasis on the impacts of modernity and colonialism.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 2035 (3) Design Fundamentals

Introduces principles and techniques relevant to the expression of dramatic mood and idea through visual elements of the theatre, giving practice in concept development, style selection, and rendering techniques in scenery and costume design.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 2043 (3) Voice and Movement for the Stage

Natural resources of the human voice and body are studied as artistic resources for the performing artist. Designed to examine both the process and products of vocal and physical craft work.

Requisites: Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

Additional Information: Departmental Category: Performance

THTR 2059 (3) Open Topics in Theatre and Drama

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online schedule planner.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 2105 (3) Introduction to Performance Design

Introduces the creative/collaborative process of design for theatre and dance, including scenery, costume, lighting, and sound. Students create design projects and evaluate them with regard to artistic and practical concerns. Much of the course work is hands-on, experiential, and team-oriented.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 2849 (1-3) Independent Study

Repeatable: Repeatable for up to 3.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 3005 (3) Costume Design 1

Study and application of the principles of design as applied to stage costume, emphasizing texts in analysis and interpretation. Presented in a studio format and project driven. Explores concept development, style selection, and extensive practice in a variety of media and techniques for costume rendering.

Requisites: Requires prerequisite course of THTR 1115 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3011 (3) American Musical Theatre History

Studies the creation, evolution and influence of American musical theatre and its importance to American society. Students analyze landmark productions, artists and the creative process.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite 3 credits in THTR, DNCE or MUSC.

Additional Information: Arts Sci Core Curr: Literature and the Arts
Departmental Category: History/Dramaturgy/Directing

THTR 3013 (3) Studio 1: Building a Character

Students learn to deepen and develop their proficiency with specific acting techniques. Explores the craft elements of acting, as well as text analysis.

Requisites: Restricted to Theatre (TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 3015 (3) Scene Design 1

Examines the process of theatrical scene design from early conception to realization. Course work is project-based. Students are introduced to the crafts of script analysis, conceptualization, design expression, drafting, and 3-D model building.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3023 (3) Studio 2: Creating a Role

Continued development of acting technique and tools for play analysis, with particular emphasis on scene study. Special attention will be given to the Master Teachers of Acting and their pedagogies.

Requisites: Requires prerequisite course of THTR 3013 (minimum grade C-). Restricted to Theatre (TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 3031 (3) Development of Theatre 3: 20th Century International Drama

Introduces 20th century international drama. Discusses selected plays by major African, Asian, and European authors and explores different dramatic traditions and their increasing interactions throughout the 20th century.

Additional Information: Departmental Category: History/Dramaturgy/Directing

THTR 3033 (1-3) Production Research and Practicum: Acting

Allows students to undertake an acting project, either within the major season or approved departmental production. Requires detailed preparational research, rehearsal commitments, and public presentation of theories and concepts in practice. Following the performance, students present written reports and evaluations.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Performance

THTR 3035 (1-2) Production Practicum

Practical production projects within a designated area of technical theatre, design, stage management, normally related to the department's season.

Repeatable: Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3037 (2-3) Shakespeare Practicum

Students are assigned to work with production artisans of the Colorado Shakespeare Festival. While there are many possible areas, production designs for each season determine the number of available positions. May substitute for two credits of THTR 3035.

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Shakespearean Production

THTR 3043 (3) Advanced Voice for the Stage

Continues the work begun in THTR 2043. Studies advanced vocal techniques with the goal of integrating these skills into the working process of the performing artist.

Requisites: Requires prerequisite course of THTR 2043 (minimum grade C-). Restricted to Theatre (THTR or TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 3045 (3) Stage Management

Covers stage management from the inception of a production concept through the process of mounting a production, focusing on the interrelationships of the various artists involved, management and scheduling of time, and the psychology of handling a wide range of personalities.

Requisites: Requires prerequisite course of THTR 1105 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3053 (3) Acting 2

Continuation of the techniques introduced in the beginning acting course (THTR 1003). Emphasis is placed on monologues and scene study of contemporary plays. Basic techniques in developing a character are explored.

Requisites: Requires prerequisite course of THTR 1003 (minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 3055 (3) Stage Lighting Design 1

Introduces the craft of stage lighting design through experimental lighting labs, lecture/demos, hands-on production experience, and theoretical projects. Subject matter includes aesthetics of light, color theory, lighting for performance, design graphics, and basic lighting technology.

Requisites: Requires prerequisite course of THTR 1105 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3075 (3) Sound Design

Study and application of the principles of sound technology and design, emphasizing concepts of electricity, acoustics, equipment, and their application to the stage.

Requisites: Requires prerequisite course of THTR 1105 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3085 (3) Fashion, Society and Decor

Surveys topics in western dress and the decorative arts from civilizations of antiquity to contemporary time: the garments, objects, materials and technologies in the context of philosophical, political, social and technological change.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 3149 (2) Professional Orientation: Exploring Professional Potentials for THTR & DNCE Majors

Explores and identifies a wide range of professional opportunities connected to personal strengths and interests in theatre and dance by studying current professional practices, trends and cross-disciplinary connections. Instructor will: provide information/learning needed from representative professionals; open avenues to find/create employment opportunities towards internship consideration/post-graduation; and mentor structured self-assessment/professional development.

Requisites: Restricted to students with 57-180 credits (Junior or Senior Theatre (THTR or TBFA) or Dance (DNCE or DBFA) majors (excluding minors).

Additional Information: Departmental Category: Special Courses in Theatre

THTR 3849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4005 (3) Costume Design 2

Advanced studio course building on experiences and techniques studied in THTR 3005, with additional emphases on portfolio quality rendering technique and costume production technology as it affects and is affected by the designer.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Requires prerequisite course of THTR 3005 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4013 (3) Studio 3: Acting Shakespeare

In-depth study of Shakespearean texts from the perspective of their demands on the actor, including the conventions and performance styles of Elizabethan theatre.

Requisites: Requires prerequisite courses of THTR 3013 and THTR 3023 (all minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4015 (3) Scene Design 2

Advanced projects in theatrical scene design. Provides intensive practice in sketching, rendering, drafting and model-building. Emphasizes portfolio development and preparing the student designer for graduate training or professional work.

Requisites: Requires prerequisite course of THTR 3015 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4021 (3) American Theatre and Drama

Explores American theatre and drama in the 18th centuries to the present. Examines productions, their creators and performers. Contains lecture, discussion, writing and theatre practice.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

Recommended: Requisite at least 12 hours of THTR course work.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4023 (3) Studio 4: Playing with Styles

Studies selected styles of theatre performance such as Greek Drama, Comedy of Manners, Commedia Dell'art, Modern Realism, Theatre of Absurd, and Non-Western Theatre, including vocal and physical style elements.

Requisites: Requires prerequisite courses of THTR 3013, THTR 3023 and THTR 4013 (all minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4029 (1-12) Performance and Community Engagement

Engages students in harnessing the power of performance for effecting positive social change. Students work collaboratively to create performances and workshop experiences. Readings will provide theoretical foundations that serve as the basis for creative work. Students engage in creative explorations to intentionally author the future they want. Open to all forms of performance: music, film, dance, theatre.

Repeatable: Repeatable for up to 12.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4033 (3) Advanced Movement for the Stage

Continues the work begun in THTR 2043. Studies the advanced physical techniques with the goal of integrating these skills into the working processes of the performing artist.

Requisites: Requires prerequisite course of THTR 2043 (minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4035 (3) Scene Painting

Introduces the craft of scene painting through practical projects. Sessions are in a studio format. Students are trained in traditional methods of scenic art, including layout, representational painting, trompe l'oeil, faux finishing, and related skills. Students are taught about proper tool use and care, paint products, and the profession.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4039 (3) Musical Theatre Repertory

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5039

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) or Music (MUSA-BAMUS, MUSC-BMUS or MUSE-BMUE) majors only (excluding minors).

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4041 (3) Women and Theatre of the 20th and 21st Centuries

Explores a body of 20th and 21st century dramatic literature central to the study of women and theatre as well as the study of 20th and 21st century cultural history from a cross-national and multiracial feminist perspective. Major playwrights, particularly women from Asia, Africa, and Europe, are read and discussed.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5041 and WGST 4041

Recommended: Prerequisite THTR 3031.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4047 (3) Shakespeare Behind the Scenes

Detailed study of script analysis, directing concepts, staging and criticism of the plays being produced by the Colorado Shakespeare Festival.

Additional Information: Departmental Category: Shakespearean Production

THTR 4049 (1-4) Special Topics in Theatre

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5049

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4051 (3) Playwriting

Introductory course in craft of playwriting; primary focus on technique of developing short plays.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4055 (3) Stage Lighting Design 2

Assumes a basic knowledge of stage lighting; concentrates on advanced technology, processes, and design projects.

Requisites: Requires prerequisite course of THTR 3055 (minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4059 (3) Open Topics in Theatre and Drama

Covers topics not otherwise listed in the curriculum. Topics for each semester are specified in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4061 (3) Directing

Theory and practice of directing for the stage.

Requisites: Requires prerequisite courses of THTR 1003 or THTR 2003 and THTR 1105 and THTR 1115 (all minimum grade C-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors and minors.

Recommended: Prerequisites two semesters of THTR 3035.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4063 (3) Audition Techniques

Prepares students for the demands of the acting profession. Trains students in various audition techniques including general auditions, prepared auditions, cold readings, on-camera auditions, and commercial auditions. Shows how to prepare and perfect audition material in a professional and exemplary way. Discusses agents, casting directors, and the process of becoming a professional actor.

Requisites: Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 4073 (3) Performing Voices of Women

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4073

Additional Information: Departmental Category: Performance

THTR 4081 (3) Senior Seminar

Intellectual and conceptual capstone course for departmental majors with separate sections for theatre and dance students. Course promotes integration of ideas regarding history, criticism, and theory in performance and production. All inquiry throughout the semester relates to the theme of creative process.

Requisites: Restricted to Theatre (THTR, TBFA) or Dance (DNCE or DBFA) majors only (excluding minors).

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 4085 (3) Theatre Management

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5085

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4095 (1-3) Special Topics in Theatre Design and Technology

Intensive study of specialized topics in theatre technology and design. Topics and credits specified in the online Schedule Planner.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4103 (3) Acting for the Camera

Introduces fundamental tools of acting for the camera. Students learn basic film terminology, specific camera acting techniques, and the demands placed on an actor when shooting a film. Uses exercises, scenes, monologues, and readings to provide a solid understanding of how to create a character, analyze a text, utilize important vocabulary, and perform effectively on camera.

Requisites: Requires prerequisite course of THTR 1003 (minimum grade D-). Restricted to students with 57-180 credits (Junior or Senior) Theatre (THTR or TBFA) majors only.

Additional Information: Departmental Category: Performance

THTR 4105 (3) Theatre Make-Up Design

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5105

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4113 (3) Comedy: A Performance Study

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5113

Additional Information: Departmental Category: Performance

THTR 4125 (3) Watercolor Illustration and Rendering Techniques

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5125

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4145 (3) Colloquium in Advanced Design

An advanced theatre design course that emphasizes the collaborative process and advanced design presentation methods. Course work includes completion of several "mock" design projects, with students often working in collaborative teams.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4149 (1-3) Theatre Internship

Provides opportunities for theatre majors to explore career opportunities in theatre fields other than, or in addition to, those with performance emphasis. Students apply knowledge and skills developed in their major studies to a practical work experience.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Requisite 30 credit hours in THTR.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4173 (3) Creative Climate Communication

We generate multimodal compositions on the subject of climate change and engage with various dimensions of issues associated with sustainability. We work to deepen our understanding of how issues associated with climate change are or can be communicated, by analyzing previously created expressions from a variety of media (interactive theatre, film, fine art, television programming, blogs, performance art, for example) and then be creating our own work.

Equivalent - Duplicate Degree Credit Not Granted: ENVS 3173 and ATLS 3173

Recommended: Prerequisite ENVS 1000.

Additional Information: Departmental Category: Performance

THTR 4175 (3) Conceptualization

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

Equivalent - Duplicate Degree Credit Not Granted: THTR 5175

Additional Information: Departmental Category: Special Courses in Theatre

THTR 4193 (1-3) Studio 5: Senior Project

Students engage in a project or projects of their own undertaking that takes a broader experience to apply the craft utilizing self-initiative, collaborative approaches and public exhibition. Instructor consent required for non-BFA THTR performance majors.

Repeatable: Repeatable for up to 3.00 total credit hours. Allows multiple enrollment in term.

Requisites: Requires prerequisite course of THTR 3013 and THTR 3023 and THTR 4013 and THTR 4023 (all minimum grade C-).

Additional Information: Departmental Category: Performance

THTR 4555 (1-2) Production Studio

Requires participation in a Theatre Department production assignment in the areas of design, technology, or management, as well as participation in a semester portfolio review. May be repeated upto 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to Theatre (TBFA) majors only.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 4849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5010 (3) Introduction to Performance Studies

Introduces students to the diverse genealogies of the field of performance studies by surveying foundational texts and key topics and by examining theoretical and methodological questions raised by particular performance practices. Provides students with vocabulary and references to continue to navigate the field of performance studies, as well as the many other academic fields that intersect with it.

Requisites: Restricted to graduate students only.

THTR 5011 (3) Seminar: Theory and Criticism

Studies theories and criticisms of drama and theatrical performances from Plato to post-modernism.

Requisites: Restricted to graduate students only.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5025 (3) Costume Patterning and Construction

Includes techniques for the patterning and construction of contemporary and period costumes. Hands-on format covers techniques, materials and equipment particular to theatrical production.

Requisites: Requires prerequisite courses of THTR 1105 and THTR 1115 (all minimum grade C-).

Additional Information: Departmental Category: Theatre Design and Technology

THTR 5031 (3) Russian Theatre

Studies Russian theatre history and the development of Russian drama from the 18th century to the present. Taught in translation.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5039 (3) Musical Theatre Repertory

Developed around the learning of complete scenes, songs and dances that are representative of the major periods and styles within musical comedy from the 1920s to the present. Emphasizes in-class performance. Admission by audition.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4039

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5041 (3) Women and Theatre of the 20th and 21st Centuries

Explores a body of 20th and 21st century dramatic literature central to the study of women and theatre as well as the study of 20th and 21st century cultural history from a cross-national and multiracial feminist perspective. Major playwrights, particularly women from Asia, Africa, and Europe, are read and discussed.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4041 and WGST 4041

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5045 (3) Costume Crafts

Covers basic and advanced techniques in casting/molding, mask making, dyeing, painting, jewelry making, ventilating and wig style and millinery via a series of projects. Culminates in a final project encompassing all techniques. Instruction consent required.

Repeatable: Repeatable for up to 3.00 total credit hours.

Recommended: Prerequisite THTR 1115.

THTR 5049 (1-4) Special Topics in Theatre

Opportunity for students to explore, upon consultation with the instructor, areas in theatre that the normal sequence of offerings may not allow.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4049

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5051 (3) Special Topics in Theatre History

Detailed study of a particular topic in theatre history (e.g., an era, a style, a country, or an organization). Topic specified in the online Schedule Planner.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5061 (3) On Stage Studies: Asian Performance

Study of live performance forms, theory, and literature throughout Asia: performance history, production styles, and social functions of performance.

Recommended: Prerequisite background in theatre, dance, or Asian studies.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

Departmental Category: Asia Content

THTR 5065 (3) Theatrical Tailoring

Explores classic and theatrical tailoring techniques and theories through the construction of classical men's wear: trousers, vest/waistcoats and coats. Student work with hand and machine sewing techniques, patterning skills and appropriate tailoring materials. Period of exploration will vary by semester. Repeatable for credit up to 6 total credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours.

Recommended: Prerequisite THTR 1115.

THTR 5071 (3) Advanced Directing

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercises. Instructor consent required.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 5085 (3) Theatre Management

Concentrates on theory and practice of management aspects of the performing arts, emphasizing theatre and dance. Includes marketing, budgeting, house and stage management, audience development, grant writing, unions and season development. Includes practical experience.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4085

Additional Information: Departmental Category: Theatre Design and Technology

THTR 5105 (3) Theatre Make-Up Design

Explores theatrical make-up styles and techniques from initial research through paper design to final make-up. Ranging from period styles to Byzantine mosaic, to clowns, to special effects (old age, wounds, stages of healing, zombies, etc.) Techniques include ombre blending, removing eyebrows, shrinking and enlarging features, creating 3D appliances and applying silicone and foam prosthetics.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4105

Repeatable: Repeatable for up to 6.00 total credit hours.

Grading Basis: Letter Grade

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5113 (3) Comedy: A Performance Study

Examines the role of comedy in performance within various cultures through readings, viewings and a participatory exploration. We will analyze comedy within various societies to understand the underlying ideals and values. Throughout this investigation we will seek to understand what makes something comedic, why, for whom, for what purpose, when and under what circumstances.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4113

Additional Information: Departmental Category: Performance

THTR 5125 (3) Watercolor Illustration and Rendering Techniques

Gain fluency in established techniques and styles of master illustrators and painters. Famous illustrations are technically analyzed and copied in this exploration of intent, process, technique and style. Other mediums incorporated include pastels, color pencils, pen and ink and gouache. Painting supplies must be supplied by the student.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4125

Grading Basis: Letter Grade

Additional Information: Departmental Category: Theatre Design and Technology

THTR 5175 (3) Conceptualization

Fosters the student's creative and collaborative skills by introducing a variety of strategies and scenarios for conceiving live, theatrical productions, events and experiences. A project based curriculum offers several individual and team exercises in visualizing, documenting and communicating ideas for live performances, including their overall scope, aesthetic, style, audience relationship and mode of presentation.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4175

Additional Information: Departmental Category: Special Courses in Theatre

THTR 5849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6003 (1-3) Production Research and Practicum: Acting

Allows students to undertake an acting project, normally within the major theatre season, that requires detailed preparatory research, testing of ideas, and public presentation. Students work under faculty supervision and prepare a written report and evaluation of the research, rehearsal, and performance process.

Recommended: advanced studies in acting and advisor approval.

Additional Information: Departmental Category: Performance

THTR 6005 (1-3) Production Research and Practicum: Designing

Allows students to undertake a design project, normally within the theatre season, that requires detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision, and prepare a documented written report and evaluation of the research, design, and realization process, as well as fully rendered designs and/or plots. Projects may be in costumes, lights, or scenery.

Additional Information: Departmental Category: Theatre Design and Technology

THTR 6007 (3) Colorado Shakespeare Festival Dramaturgy

Students work as production dramaturgs for the Colorado Shakespeare Festival, developing detailed textual, historical, and critical research for CSF productions, participating in education and outreach programs, and writing production-related articles for publication.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Shakespearean Production

THTR 6009 (1) Research Strategies and Techniques

Examines research methodologies appropriate to the performing arts, particularly theatre and dance. Projects are aimed at familiarizing graduate students with the library and other resources, and the development of thesis and dissertation prospectuses.

Equivalent - Duplicate Degree Credit Not Granted: DNCE 6009

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6011 (3) On-Stage Studies: Global Ancient and Classical Theatre

Studies classical and neoclassical drama in performance, with particular attention to 20th century productions and the critical and scholarly responses to these productions.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

Departmental Category: Asia Content

THTR 6021 (3) On-Stage Studies: English Renaissance Drama

Studies Elizabethan and Jacobean dramatic texts as playscripts for performance, with particular attention to contemporary Shakespeare criticism and landmark Shakespeare productions over the last two centuries.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6031 (3) On-Stage Studies: American Theatre

Studies American drama in performance, with particular attention to critical and scholarly responses to landmark productions of American classics.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6041 (3) On-Stage Studies: Global Modern Theatre

Studies global theatre from 1600 to 1950, with particular attention paid to critical and scholarly responses to landmark productions of classics from the period.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6051 (1-3) Production Research and Practicum: Directing

Advanced study of theory and practice of stage directing through examination of the work of leading directors, analysis of texts and classroom exercise. Instructor consent required.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6071 (3) Seminar: Perspectives on Acting

Art of acting is examined through study of acting theories and practices developed during major periods of theatre history. Examines the variety of theories about acting that remain today.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6081 (3) Seminar in American Theatre: Lesbians and Gays

Studies the portrayal of lesbians and gays in mainstream American theatre during the 20th and 21st centuries, as well as the contributions of gay and lesbian theatre artists during the same period.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6091 (1-3) Production Research and Practicum: Dramaturgy

Students undertake a dramaturgical project, normally within the major season, requiring detailed preparatory research, testing of ideas, and public presentation of theories and concepts in practice. Students work under faculty supervision and prepare a documented written report of their project.

Recommended: advanced course work in dramatic literature and advisor approval.

Additional Information: Departmental Category: History/Dramaturgy/ Directing

THTR 6111 (3) Global Contemporary Theatre

Explores global theatre from the early 1960s to the present, with particular attention towards balancing the avant garde and popular theatre in recent world drama.

THTR 6849 (1-3) Independent Study

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6949 (1) Master's Candidate

Grading Basis: Pass/Fail

Additional Information: Departmental Category: Special Courses in Theatre

THTR 6959 (1-6) Master's Thesis

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Additional Information: Departmental Category: Special Courses in Theatre

THTR 7004 (6) Colorado Shakespeare Festival Summer Immersion

Immersive two-week summer intensive designed to provide an in-depth study of Shakespeare with the Colorado Shakespeare Festival (CSF). Students learn from and engage with CSF company members and faculty from English and Theatre and Dance departments in a small group, experiential setting. Students attend plays, rehearsals and lectures, and explore acting, directing and pedagogy.

Additional Information: Departmental Category: Shakespearean Production

THTR 8999 (1-10) Doctoral Dissertation

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Additional Information: Departmental Category: Special Courses in Theatre

TDXD 5005 (3) Design Technology 1: Visual Technology

Explores the established and cutting edge technologies employed to implement the visual elements of designed environments and experiences. Develops an understanding of the function of these areas, the ways in which they interact in a complete experience and the new directions of experimentation. Elicits research, analysis and development of new concepts in response to design problems as the core modality of this course.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5105 (3) Collaboratory in Experience Design 1

Addresses philosophies of storytelling through experience and the general concepts and aesthetics of Experience Design. The first in a two-part series, this course lays foundational principles focusing on the components of a live experience and how space, narrative and interaction affect the design from early conceptualization through implementation.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Process

TDXD 5500 (3) Experience Design Atelier 1: Design Evolution and Expression

Introduces students to various techniques for graphically representing design ideas using drawing and illustration techniques in order to augment and deepen the diverse skill sets of students in the class. The first in three-part sequence on graphic representation and expressive practices, students will learn how to work out design ideas through sketching, drawing, creating storyboards and collages.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5700 (3) Experience Design Atelier 2: Introduction to Design Graphics

Introduces students to advanced techniques for representing design ideas in graphic form including commonly used software applications (Sketchup, Vectorworks, AutoCAD), scale modeling, mechanical drawing and rendering. The second in a three-part class sequence on graphic representation and expressive practices, this atelier will offer a range of exercises tailored to the skill level of individual students.

Requisites: Requires a prerequisite course of TDXD 5500 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 5805 (6) Professional Portfolio 1

Focuses on selecting, organizing and developing a plan for presenting material that will eventually culminate in the completion of a competitive professional portfolio, a vital tool for gaining employment in the Experience Design industry. The first of a two-part credited final project, students begin the process to prepare their professional portfolio under the guidance of faculty and industry professionals.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Dsgn: Documentation

TDXD 6105 (3) Collaboratory in Experience Design 2

Introduces students to professional models of working in the Experience Design industry. The second in a two-part class sequence, students work collaboratively on industry case studies focusing on entertainment, education and cultural destination genres with input from outside professionals in the field.

Requisites: Requires a prerequisite course of TDXD 5105 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Process

TDXD 6210 (3) Storytelling for XD

Explores multi-modal, expressive strategies for experimental storytelling and investigates the diverse languages of live experience. Students complete projects using varying modes of conveyance including physical and spatial action, filmic approaches, digital media and alternative methods. Students will discuss current trends in expressive methods and the nature of story.

Requisites: Restricted to Experience Design (TDXD) MFA students only.

TDXD 6500 (3) Experience Design Atelier 3: Packaging the Design Presentation

Investigates strategies for visually communication and "selling" design ideas in a compelling and well composed visual/aural presentation. The third in a three-part sequence on graphic representation and expressive practices, this class culminates in a final, comprehensive design project portfolio that follows current professional standards.

Requisites: Requires a prerequisite course of TDXD 5700 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Design: Technique

TDXD 6805 (6) Professional Portfolio 2

Through editing materials collected in TDXD 5805, students will complete adaptable versions (hard copy, digital, web-based and presentations) of their professional portfolios. In this second of a two-part credited project, a committee comprised of faculty and industry professionals guide the completion of XD portfolios.

Requisites: Requires a prerequisite course of TDXD 5805 (minimum grade B-). Restricted to Experience Design (TDXD MFA) students only.

Additional Information: Departmental Category: Experience Dsgn: Documentation

TDXD 6901 (3) XD Implementation and Engineering

Explores the realities and challenges of implementing themed entertainment design. Within the framework of project based case studies and a real work project, this course analyzes aspects of construction management, client management and approvals, scheduling, budgeting, value engineering, architecture and design.

Requisites: Restricted to Experience Design (TDXD MFA) students only.

TDXD 6910 (6) The Experience Design Center

Offers Experience Design students an opportunity to engage in and complete projects posed by industry professionals or non-profit partners seeking assistance with experiential projects in a professional, practicing lab/studio setting. The XD Center, housed in a campus "maker-space," accepts design challenges and assignments that provide a realistic field experience for students.

Requisites: Restricted to Experience Design (TDXD) MFA students only.

Thesis Music (TMUS)

Courses

TMUS 4403 (1-3) Special Studies Music History

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4413 (1-3) Special Study Music Education

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4423 (1-3) Special Study Music Theory

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4433 (1-3) Special Study Choral

Offers advanced studies for special projects in selected areas. For undergraduate majors only. See current online Schedule Planner for specific course number.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4443 (1-3) Special Study Keyboard

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4453 (1-3) Special Study Conducting

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4463 (1-3) Special Study Strings

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4473 (1-3) Special Study Voice

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4483 (1-3) Special Study Wind, Brass, Percussion

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 4493 (1-3) Special Studies Omnibus

Offers advanced studies for special projects in selected areas. For undergraduate majors only.

Repeatable: Repeatable for up to 99.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCU) undergraduate students only.

TMUS 5504 (1-3) Special Studies

Offers graduate studies for special projects in selected areas. For master's degree students only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5514 (1-3) Special Study-Music Education

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5524 (1-3) Special Study-Music Theory

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5534 (1-3) Special Study-Choral

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5544 (1-3) Special Study-Keyboard

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5554 (1-3) Special Study-Conducting

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5564 (1-3) Special Study-Strings

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5574 (1-3) Special Study-Voice

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5584 (1-3) Special Study-Wind/Percussion

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5594 (1-3) Special Study-Omnibus

Offers graduate studies for special projects in selected areas. For master's degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5605 (1-3) Special Studies

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5615 (1-3) Special Study-Music Education

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5625 (1-3) Special Study-Music Theory

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5635 (1-3) Special Study-Choral

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5645 (1-3) Special Study-Keyboard

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5665 (1-3) Special Study-Strings

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5675 (1-3) Special Study-Voice

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5685 (1-3) Special Study-Winds/Brass/Percussion

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 5695 (1-3) Special Study-Omnibus

Offers advanced graduate studies for special projects in selected areas. For doctoral degree students only.

Repeatable: Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to College of Music (MUSCG) graduate students only.

TMUS 6947 (1) Candidate for Master of Music

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to College of Music (MUSM or MUPC) graduate students only.

Grading Basis: Pass/Fail

TMUS 6956 (1-2) Master's Thesis

Requisites: Restricted to College of Music (MUSM or MUPC) graduate students only.

TMUS 6957 (1-2) Master's Thesis 2

Requisites: Restricted to College of Music (MUSM or MUPC) graduate students only.

TMUS 8019 (1) Precandidate for Doctor of Musical Arts

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Grading Basis: Pass/Fail

TMUS 8029 (1) Candidate for Doctor of Musical Arts

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

Grading Basis: Pass/Fail

TMUS 8119 (1-4) Composition Project 1

Students compose works in a variety of genres, totaling at least 30 minutes of music. Students meet weekly with a composition teacher to discuss and develop their works.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8129 (1-4) Composition Project 2

Students compose works in a variety of genres, totaling at least 30 minutes of music. Students meet weekly with a composition teacher to discuss and develop their works.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Requires prerequisite course of TMUS 8119 (minimum grade D-). Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8219 (1-3) Dissertation Project 1 (Solo Recital, Choral Concert, Composition)

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8229 (1-3) Dissertation Project 2 (Solo Recital, Choral Concert, Composition, Vocal Pedagogy)

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8239 (1-3) Diss Proj 3 (Chamber Music Recital, Vocal Pedagogy Project, Choral Project, Composition Recital)

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8249 (1-3) Diss Proj 4 (Chamber Music Recital, Choral Project, Composition Recital, Wind/Percussion Practicum)

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8259 (1-3) Dissertation Project 5 (Research Lecture)

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8269 (1-3) Dissertation Project 6 (Research Lecture)

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8279 (3) Performance Research Document 1

Repeatable: Repeatable for up to 3.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8289 (1) Performance Research Document 2

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8299 (1) Performance Research Document 3

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8309 (1) Performance Research Document 4

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8319 (1-3) Repertoire Project

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8329 (1-6) Document/Pedagogy Project

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8339 (1-6) Major Composition

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to Music (MUAD, MUED or MUSD) graduate students only.

TMUS 8998 (1-10) PhD Thesis

Repeatable: Repeatable for up to 10.00 total credit hours.

Requisites: Restricted to College of Music (MUED or MUSD) graduate students only.

Tibetan (TBTN)

Courses

TBTN 1010 (4) Beginning Colloquial Tibetan 1

Provides a thorough introduction to colloquial forms of Tibetan. Focuses on conversation practice, the acquisition of basic vocabulary and grammar in colloquial usage, learning the alphabet, and training in the skills of pronunciation, spelling and handwriting.

Additional Information: Departmental Category: Tibetan

TBTN 1020 (4) Beginning Colloquial Tibetan 2

Provides a thorough introduction to colloquial forms of Tibetan. Continues the development of vocabulary and grammar begun in Tibetan I and expands the range of conversation topics. While students focus on oral and aural skills, they begin to learn to read and write modern Tibetan to produce an overall knowledge of the language.

Requisites: Requires prerequisite course of TBTN 1010 (minimum grade C).

Additional Information: Departmental Category: Tibetan

TBTN 2010 (4) Intermediate Colloquial Tibetan 1

Aims at increasing students' proficiency in colloquial forms of Tibetan. Expands knowledge of the vocabulary and grammar of spoken Tibetan and engages in more advanced conversation topics while also continuing to develop reading knowledge of modern Tibetan.

Requisites: Requires prerequisite courses of TBTN 1010 and 1020 (all minimum grade C).

Additional Information: Departmental Category: Tibetan

TBTN 2020 (4) Intermediate Colloquial Tibetan 2

Aims at increasing students' proficiency in colloquial forms of Tibetan. Expands knowledge of the vocabulary and grammar of colloquial Tibetan and also continues to develop knowledge of reading and writing modern Tibetan.

Requisites: Requires prerequisite course of TBTN 2010 (minimum grade C).

Additional Information: Departmental Category: Tibetan

TBTN 3210 (4) Beginning Literary Tibetan 1

Provides a thorough introduction to literary and colloquial forms of Tibetan. Focuses on the grammatical foundation of the language, the acquisition of basic vocabulary, and training in the skills of pronunciation, conversation, handwriting and spelling.

Requisites: Requires prerequisite course of TBTN 2020 (minimum grade C).

Additional Information: Departmental Category: Tibetan

TBTN 3220 (4) Beginning Literary Tibetan 2

Continuation of TBTN 3210. Provides a thorough introduction to literary and colloquial forms of Tibetan. Continues the grammar and vocabulary work begun in Tibetan 1 by studying actual Tibetan text and moving to more advanced conversation topics. Students develop oral, aural and written skills to produce an overall knowledge of the language.

Requisites: Requires prerequisite course of TBTN 3210 (minimum grade C).

Additional Information: Departmental Category: Tibetan

TBTN 4210 (4) Intermediate Literary Tibetan 1

Aims at increasing students' proficiency in literary and colloquial forms of Tibetan. Expands knowledge of the grammar and vocabulary of literary Tibetan through translating texts in a variety of genres and also continues to develop knowledge of spoken modern Tibetan.

Requisites: Requires prerequisite courses of TBTN 3210 and 3220 (all minimum grade C).

Additional Information: Departmental Category: Tibetan

TBTN 4220 (4) Intermediate Literary Tibetan 2

Continuation of TBTN 4210. Aims at increasing students' proficiency in literary and colloquial forms of Tibetan. Expands knowledge of the grammar and vocabulary of literary Tibetan through translating texts in a variety of genres and also continues to develop knowledge of spoken modern Tibetan.

Requisites: Requires prerequisite course of TBTN 4210 (minimum grade C).

Additional Information: Departmental Category: Tibetan

Women & Gender Studies (WGST)

Courses

WGST 1006 (3) The Social Construction of Sexuality

Discusses the social determinants of sexuality. Analyzes the economic, psychological and cultural influences on human sexuality. Interactional perspective of human sexuality is presented.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 1006

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Sociology

WGST 1016 (3) Sex, Gender, and Society 1

Examines status and power differences between the sexes at individual and societal levels. Emphasizes historical context of gender roles and status, reviews major theories of gender stratification.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 1016

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Human Diversity

Departmental Category: Sociology

WGST 1260 (3) Introduction to Women's Literature

Introduces literature by women in England and America. Covers both poetry and fiction and varying historical periods. Acquaints students with the contribution of women writers to the English literary tradition and investigates the nature of this contribution.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 1260

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: English

WGST 2000 (3) Introduction to Feminist Studies

Introduces students to the field of Women and Gender Studies. Examines gender issues in the United States from interdisciplinary, multicultural and feminist perspectives. Covers such topics as sexuality, beauty ideals, women's health, violence against women, work, the economy, peace and war and the environment.

Additional Information: Arts Sci Core Curr: Human Diversity

MAPS Course: Social Science

WGST 2020 (3) Femininities, Masculinities, Alternatives

Examines the construction of gender and sexual identities in the modern world. Focuses on the role of social attitudes and material circumstances in shaping how individuals understand themselves and are understood by others, as well as the actions they take to accept, negotiate and resist these pressures.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 2030 (3) Introduction to Lesbian, Gay, Bisexual, and Transgender Studies

Investigates the social and historical meanings of racial, gender, and sexual identities and their relationship to contemporary lesbian, bisexual, gay and transgender communities.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 2000

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: LGBT Studies

WGST 2050 (3) Gender, Sexuality, and Popular Culture

Explores diverse cultural forms such as film, popular fiction and non-fiction, music videos, public art, websites, blogs and zines which are shaped by, and in turn shape, popular understandings of gender at the intersections of race, class, ability, religion, nation and imperialism.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 2100 (3) Gender and Sexuality in Ancient Greece

Examines evidence of art, archaeology and literature of Greek antiquity from a contemporary feminist point of view. Focuses on women's roles in art, literature and daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2100

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Classics

WGST 2110 (3) Gender and Sexuality in Ancient Rome

Uses art, archaeology, and literature to study, from a contemporary feminist point of view, the status of women in works of Roman art and literature, the development of attitudes expressed toward them, and their daily life. No Greek or Latin required.

Equivalent - Duplicate Degree Credit Not Granted: CLAS 2110

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Classics

WGST 2200 (3) Women, Literature, and the Arts

Introduces the contributions of women to literature and the performing arts from a historical and cross-cultural perspective. Emphasizes the cultural contexts in which artworks are created, as well as representations of gender and sexuality. Stresses issues of structure, content, and style, along with the acquisition of basic techniques of literary and arts criticism.

Recommended: Prerequisite WGST 2000.

Additional Information: Arts Sci Core Curr: Human Diversity

Arts Sci Core Curr: Literature and the Arts

WGST 2290 (3) Philosophy and Women

Explores different approaches to the study of women.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 2290

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Philosophy

WGST 2400 (3) Women of Color and Activism

Studies the history of social activism in the United States by women of color, with an emphasis on modes of social activism, issues that have organized specific communities of color, issues that have crossed ethnic/racial boundaries and the interaction of women from different ethnic/racial groups, including women of color and white women.

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: GT Pathways: GT-HI1 - History

Arts Sci Core Curr: United States Context

WGST 2600 (3) Gender, Race, and Class in a Global Context

Examines the positionality of women in terms of gender, race, ethnicity, class and power relations in a global context.

Additional Information: GT Pathways: GT-SS3 -Soc Behav Sci:Hmn Behav, Cult, Soc Frame

Arts Sci Core Curr: Contemporary Societies

Departmental Category: Asia Content

WGST 2700 (3) Psychology of Gender and Sexuality

Examines psychological research on gender and sexuality as they intersect with race, class and other social categories. Points of emphasis include differences in cognition, attitudes, personality and social behavior. Conceptual themes include research methodologies, implicit and explicit attitudes, stigma and stereotypes. These elucidate such areas as close relationships, leadership, career success and mental health and happiness.

Equivalent - Duplicate Degree Credit Not Granted: PSYC 2700

Recommended: Prerequisite WGST 2000 or PSYC 1001.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 2800 (3) Women and Religion

Examines roles of women in a variety of religious traditions including Judaism, Christianity, Hinduism, Buddhism and goddess traditions.

Equivalent - Duplicate Degree Credit Not Granted: RLST 2800

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Religious Studies

WGST 3004 (3) Women in Education

Honors women in education and their legacy. Introduces women educators, beginning in the late 19th century, whose significant theories of education and work in teaching have had an impact on all of our lives, in history and in society. Explores the educational theories and methods of several representative women educators and analyzes them through an investigation of their professional and personal lives.

Equivalent - Duplicate Degree Credit Not Granted: HONR 3004

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Honors
Departmental Category: Journalism

WGST 3012 (3) Women and Development

Investigates the status of women in the context of globalization and social and economic development.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3012

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Sociology
Departmental Category: Asia Content

WGST 3016 (3) Marriage and the Family in the United States

Comparative and historical examination of marriage and the family within the U.S. Emphasizes changing family roles and family structures. Also considers alternatives to the nuclear family and traditional marriage exploring new definitions of family.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3016

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Arts Sci Core Curr: United States Context
Departmental Category: Sociology

WGST 3020 (3) Methods of Inquiry in Gender, Race, Class, and Sexuality

Examines various research methods and approaches in women's and gender studies. Students will gain practical experience to be able to write a proposal for a significant research project, informed by course readings and discussions.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3044 (3) Race, Class, Gender, and Crime

Overview of race, class, gender and ethnicity issues in offending, victimization and processing by the justice system. Examines women and people of color employed in the justice system.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3044 and SOCY 3044

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 1001 or SOCY 1004 or SOCY 1021 or SOCY 2044.

Additional Information: Departmental Category: Sociology

WGST 3046 (3) Topics in Sex and Gender

Faculty present courses based on their area of expertise and specialization in the field of sex and gender. Students should check current sociology department notices of course offerings for specific topics.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 3046

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sociology

WGST 3100 (3) Feminist Theories

Explores a variety of alternative systematic accounts of, and explanations for, gender inequities. Social norms of both masculinity and femininity are analyzed in relation to other axes of inequality such as class, sexuality, race/ethnicity, neocolonialism and the domination of nonhuman nature.

Requisites: Requires a prerequisite course of WGST 2000 or WGST 2020 or WGST 2050 or WGST 2600 (minimum grade C-). Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 3110 (3) Feminist Practical Ethics

Explores a variety of personal and public policy issues in light of basic feminist commitment to opposing women's subordination. Provides students not only with a deeper understanding of the specific issues discussed but also with a sense of the ways in which a principled commitment to feminism may influence and be influenced by prevailing interpretations of contemporary ideals and values (such as freedom, equality and community). Provides an opportunity to develop skills of critical analysis useful in a wide range of contexts.

Equivalent - Duplicate Degree Credit Not Granted: PHIL 3110

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2000 or WGST 2290 or PHIL 2290.

Additional Information: Arts Sci Core Curr: Ideals and Values

WGST 3135 (3) Chicana Feminisms and Knowledges

Provides insight into the present socioeconomic condition of Chicanas and the concept of feminismo through interdisciplinary study of history, sociology, literary images and film portrayals.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3136

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite ETHN 2001 or ETHN 2536.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Chicano Studies

WGST 3174 (3) Sex, Power, and Politics: U.S. Perspectives

Explores how norms of sex, gender, race and sexuality find expression in institutions and policies in ways that legitimize only certain individuals as political actors, certain identities as politically relevant, and certain relationships as important. Critically examines how norms may be exposed, resisted and changed by studying the politics of the women's, gay liberation and men's movements in the U.S.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3174

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite PSCI 2004 or WGST 2000 or LGBT 2000.

Additional Information: Departmental Category: Political Science

WGST 3200 (3) Religion and Feminist Thought

Examines the origin of patriarchal culture in the theology and practices of Judaism and Christianity. Explores attitudes and beliefs concerning women as Judeo-Christian culture impacts gender roles and gender stratification through reading and discussion. Women's religious experience is studied from the perspective of feminist interpretations of religiosity.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3200

WGST 3201 (3) Women, Gender & Sexuality in Jewish Texts & Traditions

Reads some of the ways Jewish texts and traditions look at women, gender and sexuality from biblical times to the present. Starts with an analysis of the positioning of the body, matter and gender in creation stories, moves on to the gendered aspects of tales of rescue and sacrifice, biblical tales of sexual subversion and power, taboo-breaking and ethnos building, to rabbinic attitudes towards women, sexuality and gender and contemporary renderings and rereadings of the earlier texts and traditions.

Equivalent - Duplicate Degree Credit Not Granted: JWST 3202 and HEBR 3202 and RLST 3202

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 3208 (3) Women in Nordic Society: Modern States of Welfare

Examines the role and status of women and marginalized social classes in the Nordic countries, whose societies have been heralded as egalitarian models since the twentieth century. Texts include a variety of media, from literature to sociological works to artifacts of political and popular culture.

Equivalent - Duplicate Degree Credit Not Granted: SCAN 3208

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Nordic (Formerly Scandinavian)

WGST 3210 (3) American Indian Women

Explores the experiences, perspectives and status of American Indian women in historical and contemporary contexts. Examines representations of Indigenous women in mainstream culture. Emphasizes the agency of American Indian women-their persistence, creativity and activism, especially in maintaining Indigenous traditions.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3213

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600 or ETHN 2001 or ETHN 1023.

Additional Information: Arts Sci Core Curr: Human Diversity

WGST 3220 (3) Women in Islam

Examines the historical and contemporary relation between women, gender and Islamic cultures in different parts of the world. We will consider the role and rights of women in Islam, historical and literary representations of Muslim women, and the historically changing constructions of gender and sexuality in Muslim societies. In addition, we will critically explore the construction of Muslim women in western discourses, including liberal feminist discourse, and ask whether the representation of Muslim women in these discourses achieves or undermines ends that we might consider "Feminist". In attending to the wide range of Muslim women's lived experiences in Islamic communities and cultures, as well as the self-representations of Muslim women themselves, our readings will urge us to reexamine our presumptions about piety, secularism, modernity and feminism.

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Departmental Category: Asia Content

WGST 3250 (3) Disney's Women and Girls

Examines the construction of gender, race, class, sexual orientation and disability in a selection of Disney's animated films. Cultivates skills of media literacy, exploring how mass media acts to enforce and maintain conventional gendered understandings of power, privilege and difference. Analyzes the political economy of the Disney phenomenon through a feminist lens.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 3267 (3) Women Writers

Introduces literature by British and American women.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3267

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

Additional Information: Departmental Category: English

WGST 3300 (3) Gender, Sexuality and U.S. Law

Contemporary and historic overview of U.S. courts' treatment of sex and gender. Using the case method, examines policy issues including, but not limited to: same sex marriage and civil unions; privacy; affirmative action; abortion; reproductive technologies; discrimination based on sex and sexual orientation in education and in the workplace.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3301

Recommended: Prerequisite WGST 2000 or PSCI 1101.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Political Science

WGST 3302 (3) Facilitating Peaceful Community Change

Students gain knowledge and skills that enable them to become effective agents of community change. Focuses on understanding the processes of community building with a multicultural emphasis. Students are encouraged to apply their own life experiences and to examine themselves as potential change agents.

Equivalent - Duplicate Degree Credit Not Granted: INVS 3302

WGST 3311 (3) Gender and U.S. Politics: Protest, Polls and Policy

Provides an overview and critical examination of women as political actors within the United States. Students will examine the gendered components of citizenship, election, political office and public policy. Furthermore, students will explore the ways in which gender intersects with class, race, ethnicity, sexual orientation and other identities in U.S. politics.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3311

WGST 3314 (3) Violence Against Women and Girls

Focuses on aspects of the victimization of women and girls that are "Gendered" - namely, sexual abuse and intimate partner abuse. Also explores the importance of race, class and sexuality in gendered violence.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3314 and SOCY 3314

Recommended: Prerequisite SOCY 1016 or WGST 1016.

WGST 3400 (3) Gender, Personality, and Culture

Explores the relationship among gender, culture and personality. Brings together the disciplines of psychology and sociology in the study of gender and personality formation through investigation of psychoanalytic theory and the social environment.

Recommended: Prerequisite WGST 2000 or WGST 2700.

WGST 3410 (3) Gender, Sexuality and Culture in the Modern Middle East

Examines the issues of gender and sexuality in the modern Middle East and North Africa from the colonial period to the present, focusing on how feminist movements, Arab women's writing and constructions of gender and sexuality have been shaped by local, national and international factors.

Equivalent - Duplicate Degree Credit Not Granted: ARAB 3410

Grading Basis: Letter Grade

Additional Information: Departmental Category: Arabic

WGST 3500 (3) Global Gender Issues

Introduces global gender issues, such as the gendered division of labor in the global economy, migration, women's human rights, environmental issues, gender violence in war, women in the military, nationalism and feminism and the representation of the Third World in the United States. Offers students the opportunity to broaden their perspectives beyond the borders of the United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2050 or WGST 2600.

Additional Information: Departmental Category: Asia Content

WGST 3505 (3) Historical and Contemporary Issues of African American Women

Explores the social, economic, political, historical and cultural role of African American women from an interdisciplinary perspective. Special emphasis is placed on African American women's rich oral and literary tradition.

Equivalent - Duplicate Degree Credit Not Granted: ETHN 3502

Recommended: Prerequisite WGST 2000 or ETHN 1022 or ETHN 2001.

WGST 3510 (3) Gender, Sexuality and Global Health

Examines the intersections of gender, sexuality and health in global perspective. Explores how men's and women's health are shaped by gender and sexual relations in a wide range of social contexts, including South and Southeast Asia, Latin America, sub-Saharan Africa and the United States.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: Sociology

WGST 3600 (3) Latinas: History, Culture, and Social Activism

Drawing from work produced by and about Latinas, discusses the social and cultural construction of race and ethnicity, the function of nationalism, the politics of migration and citizenship, Latina literary production and theory, historiographical trends, Latina feminist theory, activism and the academy, and Latina/o political organizing.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3601 (3) German Women Writers

Explores writing by German/Austrian women from 1945 to the present, with special attention to the representation of the Holocaust, the continuation of avant-garde traditions, innovations in literary form and feminism. Visual arts, film and feminist theory will also be considered in their relation to literature. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 3601

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: German

WGST 3650 (3) Gender and Politics in Latin America

Examines Latin American politics with particular focus on women's participation in social movements, war, revolution and elections. Compares women's and men's politics and activism and examines changing gender and sexuality policies, gender relations and the differential impact of political, economic, and social changes on men and women.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 3052

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2600 or PSCI 2012 or PSCI 3032.

Additional Information: Departmental Category: Political Science

WGST 3670 (3) Gender, Race, Sexuality and Global Migration

Engages in an interdisciplinary study of the intersections of gender, race and sexuality that have created a multicultural, multiethnic and multiracial world. Focuses on the effects of political, economic, social and cultural forces on gender, race and sexuality in migrant communities.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Ethnic Studies

WGST 3672 (3) Gender and the Global Economy

Examines the role of gender in global economy. Explores the impacts of colonialism and modern global economy on gender relations, with particular emphasis on Third World societies. Also focuses on related issues of population politics, environmental crisis, women's sexual exploitation and women's social movements worldwide.

Equivalent - Duplicate Degree Credit Not Granted: GEOG 3672

Recommended: Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2002 or GEOG 2412 or WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Human Diversity

Departmental Category: Geography

WGST 3700 (3) Topics in U.S. Gender and Sexuality Studies

Examines selected topics in women, gender and sexuality in the US context.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3710 (3) Topics in Global Gender and Sexuality Studies

Content varies by semester and reflects relevant issues in global feminist scholarship.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 3750 (3) Women in Buddhism

Explores diverse representations of the female in Buddhist literature and the social realities of actual women in Asian historical contexts. Through case studies that traverse Buddhist Asia, we delve into monastic views of the female body, philosophical analyses of the emptiness of gender, idealized images of the feminine in Buddhist tantra and contemporary issues such as the nun's revival moment.

Equivalent - Duplicate Degree Credit Not Granted: RLST 3750

Additional Information: Departmental Category: Religious Studies
Departmental Category: Asia Content

WGST 3767 (3) Feminist Fictions

Examines a series of literary texts to consider how writers across the world have used fiction to creatively stage and reimagine gender and sexuality. Attends to the formal and narrative techniques by which these texts call attention to the fictionality, and thereby the creative malleability, of gender itself. Some cinematic and performance texts will also be included.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 3767

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: English

WGST 3800 (3) Advanced Writing in Feminist Studies

Offers expository writing and training in analytical and descriptive skills, structures or argument, critical thinking, the rhetoric of persuasion, and the development of a personal voice. Readings and papers focus on basic issues in gender studies.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2000 or WGST 2600.

Additional Information: Arts Sci Core Curr: Written Communication

WGST 3930 (1-6) Women and Gender Studies Internship

Provides field experience in local and national government and non-governmental agencies focusing on women and gender-related issues. Supervision by approved field instructors. Students must relate their academic experience to their field work experience through a portfolio and a final paper. Department enforced prerequisite: 6 hours of course work in Women and Gender Studies and 30 cumulative credit hours.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 3940 (1) Practicum in Women and Gender Studies

Enriches the academic experience of majors and minors within Women and Gender Studies. Usually will combine readings from books with lectures and discussions, community outreach and in-house publications spanning the interdisciplinary focus of the department.

Repeatable: Repeatable for up to 4.00 total credit hours.

Requisites: Restricted to Womens Studies (WGST) majors or minors only.

Grading Basis: Letter Grade

WGST 4000 (3) Advanced Topics in Gender and Sexuality Studies

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

Equivalent - Duplicate Degree Credit Not Granted: WGST 5000

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 4010 (3) Gender, Genocide and Mass Trauma

Studies the persistence of genocide and the effects of mass trauma on women and girls. Within the framework of political and social catastrophe, examines cataclysmic world events and the traumatic consequences for women of religious persecution, colonialism, slavery and the genocides of the 20th and 21st centuries.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4000

Recommended: Prerequisite SOCY 1016 or WGST 1016 or WGST 2000 or SOCY 3314 or WGST 3314.

Additional Information: Departmental Category: Sociology

WGST 4016 (3) Sex, Gender and Society 2

Studies status and power differences between the sexes at individual, group and societal levels. Examines empirically established sex differences and reviews biological, psychological and sociological explanations for gender differences.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4016

Requisites: Requires a prerequisite course of SOCY 1016 or WGST 1016 or WGST 2000 (minimum grade D-). Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Departmental Category: Sociology

WGST 4041 (3) Women and Theatre of the 20th and 21st Centuries

Explores a body of 20th and 21st century dramatic literature central to the study of women and theatre as well as the study of 20th and 21st century cultural history from a cross-national and multiracial feminist perspective. Major playwrights, particularly women from Asia, Africa and Europe, are read and discussed.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4041 and THTR 5041

Recommended: Prerequisite THTR 3031.

Additional Information: Departmental Category: Theatre

WGST 4063 (3) Women in Victorian England

Examines changing roles and status of women in a period of expansion. Studies the impact of industrialization on working women, sexuality, family planning, expansion of women in education, politics and the professions, the single women crisis and women's rights.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4063

Additional Information: Departmental Category: History

WGST 4073 (3) Performing Voices of Women

Explores theories underlying the "feminine voice," varied perspectives in prose and poetry, ways of embodying these voices and perspectives in performance forms and ultimately the students' own voices through creation of autobiographical performance pieces (some to be presented for student audiences). Open to both men and women.

Equivalent - Duplicate Degree Credit Not Granted: THTR 4073

Additional Information: Departmental Category: Theatre

WGST 4086 (3) Family and Society

Studies the changing relationship between family and social structure. Examines variations in family organization and considers political, social, ideological, demographic and economic determinants of family formation.

Equivalent - Duplicate Degree Credit Not Granted: SOCY 4086

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite SOCY 3001.

Additional Information: Departmental Category: Sociology

WGST 4277 (3) Topics in Women's Literature

Focuses on areas of research interest in the study of women's literature, such as selected themes or critical issues. Students are expected to contribute original research to the topic under consideration.

Equivalent - Duplicate Degree Credit Not Granted: ENGL 4277

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

WGST 4287 (3) Special Topics in LGBT Literature

Examines a special topic in LGBT literature, foregrounding an approach that focuses on how same-sex desire is represented in literature.

May explore the rhetorical and ideological depiction of masculinity and femininity; literary representations of inversion, bisexuality, and transgenderism; the social construction of homosexuality and heterosexuality. Specific topics vary each semester.

Equivalent - Duplicate Degree Credit Not Granted: LGBT 4287 and ENGL 4287

Repeatable: Repeatable for up to 9.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

WGST 4300 (3) Sex, Power, Politics: International Perspectives

Studies the commercial trade of sexual labor in the global economy, examining theories and assumptions about sexual-economic exchanges and gendered and racialized relations of power in the sex trade.

Emphasizes prostitution.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite WGST 2600 or WGST 3100.

WGST 4301 (3) Gender, Race and Immigration in Germany and Europe

Introduces students to debates surrounding migration and race in contemporary Germany. Emphasis on reading texts in context using tools of cultural studies, integrating analyses of gender, race, nation and sexuality. Texts may include film, literature, television, magazine images. Topics include: questioning multiculturalism, self-representation, integration, Islam, citizenship, violence, public space, youth culture, racism and nationalism. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: GRMN 4301 and GRMN 5301

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: German

WGST 4331 (3) Gender, Race, Class, and Sexuality in Popular Culture

Studies the construction, interconnections, and replications of gender, race, class and sexuality in popular culture and how these constructs become cultural norms and mores. Uses critical methods with a focus on producing responsible viewers and readers.

WGST 4400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: WGST 5400 and LGBT 4400 and LGBT 5400

Grading Basis: Letter Grade

Additional Information: Departmental Category: LGBT Studies

WGST 4471 (3) Women in 20th-21st Century Russian Culture

Examines issues facing women in 20th-21st century Russia, based on study of current events, history, literature, posters and film. Studies images of women as Amazons and rebels, salon hostesses and poets, New Soviet Women and women in combat, prostitutes and mothers. Taught in English.

Equivalent - Duplicate Degree Credit Not Granted: RUSS 4471 and RUSS 5471

Recommended: Prerequisite lower level literature or culture course.

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Russian

WGST 4500 (3) Gender Politics and Global Activism

Addresses the problems and challenges women face around the world and the ways in which women have mobilized to address them. Explores political activism at the local, national, regional and global levels. Focuses on different forms of activism, including strategies aimed at working with and within governmental institutions, as well as outside and against them.

Equivalent - Duplicate Degree Credit Not Granted: PSCI 4391

Recommended: Prerequisite WGST 2000 or WGST 2600.

WGST 4616 (3) History of Gender and Sexuality in the United States to 1870

Examines the social history and cultural construction of genders and sexualities in America to 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities as served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4616 and HIST 5616

Additional Information: Departmental Category: History

WGST 4619 (3) Women in East Asian History

Considers major issues in the history of women in East Asia (China, Korea, Japan) in the 17th through 20th centuries. Focuses on gender roles in Asian family, state and cultural systems. Topic varies in any given semester.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4619 and HIST 5619

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

Additional Information: Departmental Category: History
Departmental Category: Asia Content

WGST 4620 (3) A Global History of Sexuality: The Modern Era

Provides an introduction to the history of sexuality in the modern era through engagement with recent interdisciplinary research into what sexuality has meant in the everyday lives of individuals; in the imagined communities formed by the bonds of shared religion, ethnicity, language and national citizenship; on the global stage of cultural encounter, imperialist expansion, transnational migration and international commerce.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4620

Requisites: Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

WGST 4626 (3) History of Gender and Sexuality in the United States from 1870

Examines the social history and cultural construction of genders and sexualities in America from 1870, exploring how discourses of race, religion, nationalism, medicine and criminality have shaped erotic encounters, informed gender and sexual identities and served as sites of political conflict.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4626

Additional Information: Departmental Category: History

WGST 4636 (3) Lesbian and Gay History: Culture and Politics and Social Change in the U.S.

Considers current theoretical approaches to the history of sexuality and traces the changing meaning of same-sex sexuality in the U.S. through investigation of lesbian and gay identity formation, community development, politics and queer cultural resistance.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4636 and HIST 5636

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Recommended: Prerequisite HIST 1015 or HIST 1025 or LGBT 2000 or WGST 2000 or WGST 2600.

WGST 4640 (3) Women, Gender and War

Study of how women experience war, how the structure, practice and memory of war, and the rights and obligations of military service (masculinity and femininity) are structured by the gender system.

Equivalent - Duplicate Degree Credit Not Granted: HIST 4640

Recommended: Prerequisite HIST 1015 or HIST 1020 or HIST 1025 or HIST 1123 or HIST 1628 or HIST 1708.

Additional Information: Departmental Category: History

WGST 4769 (3) Gender Studies in Early Modern Visual Culture

Examines 15th and 16th century European ideas about women from a variety of feminist perspectives. Focuses on recent contributions to history of women as they intersect with the visual arts.

Equivalent - Duplicate Degree Credit Not Granted: ARTH 4769

Additional Information: Arts Sci Core Curr: Human Diversity
Departmental Category: Art and Art History

WGST 4800 (3) Senior Colloquium in Feminist Studies

Provides students with the opportunity to actively reflect on their education and to complete a research project that incorporates an interdisciplinary and feminist approach to the study of gender, class, race, ethnicity and sexuality. Offered each spring.

Requisites: Requires prerequisite courses of WGST 2000 and WGST 2600 and WGST 3100 (all minimum grade C-). Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Womens Studies (WGST) majors or minors only.

WGST 4840 (1-6) Independent Study

Department enforced prerequisite: over minimum GPA of 3.3.

Repeatable: Repeatable for up to 7.00 total credit hours.

WGST 4850 (3) Gender in Hagiography

Explores gendered ideals of sainthood in medieval hagiographic literature. We draw primarily from the lives of female mystics in Buddhist and Christian sources, and examine the construction of mendicant masculinities. Reading from an array of primary sources, we query the category of mysticism and ask why visionary experience has so often been gendered female.

Equivalent - Duplicate Degree Credit Not Granted: RLST 4850 and RLST 5850

Grading Basis: Letter Grade

Additional Information: Departmental Category: Religious Studies

WGST 4950 (3) Honors Research

For qualified Women and Gender Studies majors working on the research phase of departmental honors. Department enforced prerequisite: overall GPA of 3.3.

Requisites: Restricted to students with 57-180 credits (Juniors or Seniors).

Additional Information: Arts Sciences Honors Course

WGST 4999 (1-3) Senior Honors Thesis

Qualified Women and Gender Studies majors may write an honors thesis, an in-depth research paper, on a topic of choice. Thesis hours available to majors only after successfully completing the research phase.

Requisites: Restricted to Womens Studies (WGST) majors only.

Additional Information: Arts Sciences Honors Course

WGST 5000 (3) Advanced Topics in Gender and Sexuality Studies

Provides an advanced interdisciplinary course organized around a specific topic, problem, or issue relating to gender and sexuality. Course work includes discussion, reading and written projects.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4000

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

WGST 5400 (3) Critical Inquiries in Transgender Studies

Examines theories, methods and debates in the emerging field of transgender studies. Drawing on interdisciplinary perspectives, examines transgender identities, communities and political movements in different historical and cultural contexts. Focuses on crosscutting issues that shape transgender subjectivities, with special attention given to how transgender movements negotiate race, class, sexuality, labor, culture and nation.

Equivalent - Duplicate Degree Credit Not Granted: WGST 4400 and LGBT 4400 and LGBT 5400

Grading Basis: Letter Grade

Additional Information: Departmental Category: LGBT Studies

WGST 6090 (3) Feminist Theories

Explores how feminist theorists have understood gender and how it interrelates to our understandings of race, ethnicity, sexuality, embodiment and knowledge. Meets the requirements for the WGST certificate.

Requisites: Restricted to graduate students only.

WGST 6190 (3) Feminist Methodology

Explores feminist methodology across a range of disciplines. Themes include experience and interpretation, the social position of the researcher, language and argument structure, knowledge and power, bias and objectivity, and the ethics and politics of research. Meets the requirements for the WGST certificate.

Requisites: Restricted to graduate students only.

WGST 6290 (3) Special Topics in Gender and Sexuality Studies

Offers interdisciplinary feminist perspectives on different special topics such as gender and war, gender and globalization, women's social movements, gender and citizenship, gender and collective memory, and cultural representations of gender and sexuality. Meets the requirements for the WGST certificate.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

WGST 6796 (3) Queer Theories

Explores key concepts and debates in the field of queer theory with an interdisciplinary focus on crosscutting issues (aesthetic, cultural, legal, medical, political and social) that shape queer subjectivities, practices and relations.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

WGST 6840 (1-3) Independent Study

Provides course credit for a directed research project or reading program in women and gender studies, supervised by a WGST faculty member and approved by the WGST graduate director. Requires an independent study approval agreement form completed by the student and signed by the faculty advisor.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

Writing and Rhetoric (WRTG)

Courses

WRTG 1100 (4) Extended First-Year Writing and Rhetoric

Extended version of WRTG 1150 that carries an additional hour of credit and is intended for students desiring more preparation and practice in college writing. Meets the same goals as WRTG 1150. Features one extra hour of small group work out of class. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

Repeatable: Repeatable for up to 8.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication

MAPS Course: English

WRTG 1150 (3) First-Year Writing and Rhetoric

Rhetorically informed introduction to college writing. Focuses on critical analysis, argument, inquiry and information literacy. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication

MAPS Course: English

WRTG 1250 (3) Advanced First-Year Writing and Rhetoric

Advanced version of WRTG 1150 intended for more experienced writers, this course meets the same goals as WRTG 1150 but at a more challenging level. Taught as a writing workshop, the course places a premium on invention, drafting and thoughtful revision. For placement criteria, see the arts and sciences advising office.

Repeatable: Repeatable for up to 6.00 total credit hours.

Additional Information: Arts Sci Core Curr: Written Communication

MAPS Course: English

WRTG 1840 (1-3) Independent Study in Writing

Repeatable: Repeatable for up to 8.00 total credit hours.

WRTG 2020 (3) Introduction to Creative Nonfiction

Explores from both the reader's and writer's perspectives the forms of creative nonfiction, including personal essay and memoir. Students will read and write extensively within this genre, develop skill in revision and peer critique and learn how to submit work for publication. Does not fulfill core requirements. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

WRTG 2090 (3) Electives in Writing

Explores a variety of academic and professional writing genres, ranging from research to technical writing, in intensive workshops. Students read and write extensively across genres. Check with program for semester offerings. Designed for self-motivated students in all majors. Does not fulfill core requirements. Department enforced prereq., WRTG 1150 or equivalent (completion of lower-division writing requirement)

Repeatable: Repeatable for up to 6.00 total credit hours.

WRTG 3007 (3) Writing in the Visual Arts

Enables students in the arts to improve their writing skills through organization, presentation, critique and revision. Writing assignments include formal writing (analysis and argument), informal writing and grant proposals. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

Requisites: Restricted to students with 57-180 credits (Junior or Senior) AAH or C-FILM or FILM or FMST or AASA or AASF or THTR or TBFA or DNCE or DBFA or AMST or ARCH or ATLS or BASA or CLAS or DSGN or ETHN or JADV or JAST or MDST or RLST or TMEN majors only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3020 (3) Topics in Writing

Through sustained inquiry into a selected topic or issue, students will practice advanced forms of academic writing. Emphasizes analysis, criticism and argument. Taught as a writing workshop, places a premium on substantive, thoughtful revision. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Arts and Sciences (ARSCU) or College of Media, Communication and Information (CMCIU) or Business (BUSNU) students only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3030 (3) Writing on Science and Society

Through selected reading and writing assignments, students consider ethical and social ramifications of science policy and practice. Focuses on critical thinking, analytical writing, and oral presentation. Taught as a writing workshop, the course addresses communication with professional and non-technical audiences.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits Engineering, MCDB, EBIO, GEOL, ASTR, IPHY, PHYS, ENVS, MATH, ECON, BCHM, CHEM, PSYC, NRSC, or CSCI majors only.

Additional Information: GT Pathways: GT-CO3 - Communication: Advanced Writing Course

Arts Sci Core Curr: Written Communication

WRTG 3035 (3) Technical Communication and Design

Rhetorically informed introduction to technical writing that hones communication skills in the context of technical design activities. Treats design as a collaborative, user-oriented, problem-based activity, and technical communication as a rhetorically informed and persuasive design art. Taught as a writing workshop emphasizing critical thinking, revision, and oral presentation skills. Focuses on client-driven design projects and effective communication with multiple stakeholders.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) College of Engineering, College of Media, Comm Info, MCDB, EBIO, GEOL, ASTR, IPHY, ENVS, MATH, ECON, BCHM, CHEM, PHYS, ENVD, PLAN, DSGN, ARCH, NRSC, or CSCI majors only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3040 (3) Writing on Business and Society

Through selected reading and writing assignments, students examine ethical and social issues in the context of business decision-making processes. Focuses on critical thinking, analytical writing and oral presentation. Taught as a writing workshop, the course emphasizes effective communication with professional and non-technical audiences. Department enforced prerequisite: WRTG 1150 or equivalent (completion of lower-division writing requirement).

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to students with 57-180 credits (Junior or Senior) Leeds School of Business (BUSN), Economics (ECON), International Affairs (IAFS) or Spanish (SPPR) majors only.

Additional Information: Arts Sci Core Curr: Written Communication

WRTG 3090 (1-3) Open Topics in Writing: Advanced

Advanced topics course providing intensive, specialized writing instruction in selected topics. Check with the program for semester offerings. Does not fulfill core requirements. Department enforced prerequisite: WRTG 3007 or WRTG 3020 WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

WRTG 3840 (1-3) Independent Study

Department enforced prerequisite: WRTG 3007 or WRTG 3020 or WRTG 3030 or WRTG 3035 or WRTG 3040 or instructor consent required.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

WRTG 5050 (3) Graduate Studies in Writing and Rhetoric

Special topics and methods course in composition theory, research and pedagogy. Topics vary by semester.

Repeatable: Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

WRTG 5840 (1-3) Independent Study-Writing & Rhetoric

Independent study.

Repeatable: Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

Requisites: Restricted to graduate students only.

Yiddish (YIDD)

Courses

YIDD 1010 (4) Beginning Yiddish 1

Introduces students to speaking, listening, reading, and writing skills in the historic language of Ashkenazic Jewry. Uses grammar as point of departure for development of oral skills.

Additional Information: Departmental Category: Yiddish

YIDD 1020 (4) Beginning Yiddish 2

Continuation of YIDD 1010. Department enforced prerequisite: YIDD 1010 (minimum grade C-).

Additional Information: Departmental Category: Yiddish

YIDD 2010 (4) Intermediate Yiddish 1

Review and continuation of skills begun in the first year: reading, writing, speaking and oral comprehension. Provides an intensive introduction to cultural and literary texts of central and eastern European Jewish culture. Department enforced prerequisite: YIDD 1020 (minimum grade C-).

Additional Information: Departmental Category: Yiddish

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